



Part 1

(18351 Questions)

MRCPass

OnExamination

PassMedicine

PasTest

ReviseMRCP

MRCPstudy

El-zohry

MRCP Questions Bank

2013

QUESTIONS & ANSWERS

1st Edition

OnExamination

(4584 Questions)

Khalid Yusuf El-Zohry

Sohag Teaching Hospital - Egypt

elzohryxp@yahoo.com

<https://www.facebook.com/elzohryxp>

Contents

مقدمة	9
OnExamination	11
[Q: 1] OnExamination - Cardiology	15
[Q: 249] OnExamination - Basic Science	109
[Q: 383] OnExamination - Emergency medicine.....	157
[Q: 494] OnExamination - Endocrinology	203
[Q: 765] OnExamination - Gastroenterology	305
[Q: 883] OnExamination - Haematology	351
[Q: 982] OnExamination - Infectious disease.....	393
[Q: 1117] OnExamination - Nephrology.....	447
[Q: 1195] OnExamination - Clinical pharmacology	481
[Q: 1314] OnExamination - Respiratory.....	523
[Q: 1400] OnExamination - Rheumatology	555
[Q: 1464] OnExamination 2012 - Nephrology.....	583
[Q: 1656] OnExamination 2012 - Cardiology	683
[Q: 1913] OnExamination 2012 - Gastroenterology	801
[Q: 2115] OnExamination 2012 - Endocrinology	897
[Q: 2534] OnExamination 2012 - Haematology	1101
[Q: 2794] OnExamination 2012 - Clinical pharmacology	1219
[Q: 2892] OnExamination 2012 - Respiratory.....	1265
[Q: 3183] OnExamination 2012 - Statistics	1414
[Q: 3227] OnExamination 2012 - Rheumatology	1435
[Q: 3460] OnExamination 2012 - Basic Science	1585
[Q: 3484] OnExamination 2012 - Dermatology	1661
[Q: 3613] OnExamination 2012 - Ethics and law	1719
[Q: 3643] OnExamination 2012 - Psychiatry.....	1733
[Q: 3736] OnExamination 2012 - Ophthalmology	1767
[Q: 3871] OnExamination 2012 - Infectious disease.....	1785
[Q: 4011] OnExamination 2012 - Neurology.....	1853
[Q: 4454] OnExamination 2012 - Medicine	2016
[Q: 4501] OnExamination 2012 - Misc.....	2041
[Q: 4526] OnExamination 2012 - Emergency Medicine.....	2109

Dedications

To my father,
my mother,
my wife,
my sons:
Abd El-Rahman,
Muhammed,
and Amr

To president Muhammad Mursi




”ليعلم أبناءنا أن أباءهم وأجدادهم
كانوا رجالاً ، لا يقبلون الضيم
ولا ينزلون أبداً على رأي الفسدة
ولا يعطون الدنيا أبداً من وطنهم
أو شرعيتهم أو دينهم“

د. محمد مرسي رئيس الجمهورية - ٢ يوليو ٢٠١٣

ד"ר מוחמד מרסי - 2 יולי 2013

ד"ר מוחמד מרסי - 2 יולי 2013

كلما نظرت في وجهه رأيت أبي، غفر الله لنا جميعاً



Take the first step, and your mind will
mobilize all its forces to your aid.

But

The first essential is that you begin

Once the battle is startled, all that is within
and without you will come to your assistance

مقدمة

الحمد لله حمداً كثيراً على أن وفقني لإخراج هذا العمل، وأتمنى أن يستفيد منه كل طالب علم، وأن يجعله خالصاً لوجه تعالى، مع رجائي لكل من يستفيد منه بالدعاء لي ولأسرتي ولسائر المسلمين بظاهر الغيب.

لقد استفدت كثيراً من تجارب الكثير والكثير من الأصدقاء، وبدون عونهم ما خرج هذا العمل بهذه الصورة، لذا لا بد أن أوجه لهم كل الشكر والفضل في هذا العمل.

حاولت في هذا الملف أن أستفيد من خبرات الكثير من الزملاء، وكل مجهودي كان في الجمع والترتيب والتنسيق، أتمنى أن يكون في ميزان حسناتي يوم القيامة.

د/ خالد يوسف الزهري

مستشفى سوهاج التعليمي – سوهاج - مصر

<https://www.facebook.com/elzohryxp>

زملائي وأساتذتي والذين تعلمت واستفدت منهم كثيراً



د. بشير حلمي

د. رياض السيد
رياض
Riyadh
Shalabiد. Inas
Mohamed
Alassarد. بلاك هاوس
Black
Houseد. Ayman
Shahin

د. مجدي أحمد

د. Ahmed
Gabrد. Heba
Mohammedد. Âquã
Marijêد. Amira
Hefney

د. Reem Ali

د. Faisal
Hemedaد. Shiny
Moonد. Aburas
Ab

Reference ranges

Reference ranges vary according to individual labs.

All values are for adults unless otherwise stated

Full blood count

Haemoglobin Men: 13.5-18 g/dl

Women: 11.5-16 g/dl

Mean cell volume 82-100 fl

Platelets 150-400 x 10⁹/l

White blood cells 4-11 x 10⁹/l

Urea and electrolytes

Sodium 135-145 mmol/l

Potassium 3.5 - 5.0 mmol/l

Urea 2.0-7 mmol/l

Creatinine 55-120 umol/l

Bicarbonate 22-28 mmol/l

Liver function tests

Bilirubin 3-17 umol/l

Alanine transferase (ALT) 3-40 iu/l

Aspartate transaminase (AST) 3-30 iu/l

Alkaline phosphatase (ALP) 30-100 umol/l

Gamma glutamyl transferase (γGT) 8-60 u/l

Albumin 35-50 g/l

Total protein 60-80 g/l

Other haematology

Erythrocyte sedimentation rate (ESR)

Men: < (age / 2) mm/hr

Women: < ((age + 10) / 2) mm/hr

Prothrombin time (PT) 10-14 secs

Activated partial thromboplastin time (APTT)
25-35 secs

Ferritin 20-230 ng/ml

Vitamin B₁₂ 200-900 ng/l

Folate 3.0 nmol/l

Reticulocytes 0.5-1.5%

Other biochemistry

Calcium 2.1-2.6 mmol/l

Phosphate 0.8-1.4 mmol/l

CRP < 10 mg/l

Thyroid stimulating hormone (TSH) 0.5-5.5
mu/l

Free thyroxine (T4) 9-18 pmol/l

Total thyroxine (T4) 70-140 nmol/l

Amylase 70-300 u/l

Uric acid 0.18-0.48 mmol/l

Arterial blood gases

pH 7.35 - 7.45

pCO₂ 4.5 - 6.0 kPa

pO₂ 10 - 14 kPa

Lipids

Desirable lipid values depend on other risk factors for cardiovascular disease, below is just a guide:

Total cholesterol < 5 mmol/l

Triglycerides < 2 mmol/l

HDL cholesterol > 1 mmol/l

LDL cholesterol < 3 mmol/l

OnExamination

		<i>From Question number</i>	<i>Total Questions</i>	<i>Page</i>
	Cardiology	1 – 248		
	Basic Science	249 – 382		
	Emergency medicine	383 – 493		
	Endocrinology	494 – 764		
	Gastroenterology	765 – 882		
	Haematology	883 – 981		
	Infectious disease	982 – 1116		
	Nephrology	1117 – 1194		
	Clinical pharmacology	1195 – 1313		
	Respiratory	1314 – 1399		
	Rheumatology	1400 – 1463		

OnExamination 2012

		<i>From Question number</i>	<i>Total Questions</i>	<i>Page</i>
	Nephrology	1464 – 1655		
	Cardiology	1656 – 1912		
	Gastroenterology	1913 – 2114		
	Endocrinology	2115 – 2533		
	Haematology	2534 – 2793		
	Clinical pharmacology	2794 – 2891		
	Respiratory	2892 – 3182		
	Statistics	3183 – 3226		
	Rheumatology	3227 – 3428		
	Basic Science	3429 – 3605		
	Dermatology	3606 – 3734		
	Ethics and law	3735 – 3760		
	Psychiatry	3761 – 3826		
	Ophthalmology	3827 – 3862		
	Infectious disease	3863 – 4002		
	Neurology	4003 – 4341		
	Medicine	4342 – 4388		
	Misc	4389 – 4526		
	Emergency Medicine	4526 – 4584		
Total			3121	



[Q: 1] OnExamination - Cardiology

In the consideration of cardiac tamponade, which of the following statements is most true?

- 1- Bradycardia is common
- 2- Early diastolic descent (y descent) is exacerbated
- 3- Pulsus paradoxus is pathognomonic
- 4- Renal failure is a recognised complication
- 5- The apex beat is always absent

Answer & Comments

Answer: 4- Renal failure is a recognised complication

Tachycardia is common in the presentation of cardiac tamponade, and the apex beat is frequently palpable. The y descent is absent, though pulsus paradoxus may or may not be present.

Pulsus paradoxus is defined as an inspiratory systolic fall in arterial pressure of 10mmHg or more. Pulsus paradoxus may also be present in massive PE, haemorrhagic shock, COPD and severe hypotension. Renal failure is a recognised complication of tamponade.



[Q: 2] OnExamination - Cardiology

A 65-year-old male presents with arthralgia and sleep disturbance following the introduction of simvastatin. He has a history of hypertension and ischaemic heart disease for which he is receiving aspirin, atenolol and eprosartan together with simvastatin 40 mg od which has been introduced in the last one month. Previously, he had been taking atorvastatin but this was changed to simvastatin after he complained of arthralgia. Investigations reveal:

Creatine Phosphokinase (CPK) 156 iu/l (40-170)

Total Cholesterol 5.1 mmol/l (<5.2)

LDL-Cholesterol 3.1 mmol/l (<2.6)

Triglycerides 1.7 mmol/l (0.5-1.7)

HDL-Cholesterol 1.2 mmol/l (0.7-1.7)

Which is the most appropriate treatment for his lipid profile?

- 1- Ezetimibe
- 2- Fenofibrate
- 3- Nicotinic acid slow release
- 4- Omega-3 fatty acids
- 5- Rosuvastatin

Answer & Comments

Answer: 1- Ezetimibe

The primary treatment target in this case is a total cholesterol < 4 mmol/l and LDL - C < 2 mmol/l. Plasma triglyceride and HDL-C are already at the currently accepted target levels. This patient describes typical statin associated side effects which are generally a class effect and dose related. The most common adverse event with statin therapy is arthralgia or myopathy often with normal CPK levels. Myositis and rhabdomyolysis are rare statin associated myopathy side effects and are defined on the basis of CPK levels > 10X normal along with features of muscle pain and myoglobinuria (for rhabdomyolysis). Risk factors predisposing to statin myopathy include advanced age, trauma, thyroid dysfunction and concomitant medication that can raise statin bioavailability including amiodarone, verapamil and many other agents that are metabolised by the Cytochrome P450 enzyme system. Ezetimibe monotherapy produces reductions in TC and LDL-C of around 20% and since tolerability issues are likely to occur with another statin, ezetimibe is the best treatment option. Clinical trial data has demonstrated continuing event rate reduction to LDL-C levels below 2 mmol/l and a meta-analysis of lipid lowering trials has demonstrated a 1 mmol/l reduction in LDL-C is associated with a 23% RRR in CHD

events irrespective of baseline risk and the method of cholesterol reduction.



[Q: 3] OnExamination - Cardiology

A 68-year-old man has been very ill for months following the onset of chronic liver disease with hepatitis C infection. He experiences a sudden loss of consciousness and then exhibits hemiplegia on the right. A cerebral angiogram reveals lack of perfusion in the left middle cerebral artery distribution.

The most likely cardiac lesion to be associated with this finding is?

- 1- Acute rheumatic fever
- 2- Left atrial myxoma
- 3- Libman-Sacks endocarditis
- 4- Non-bacterial thrombotic endocarditis
- 5- Paradoxical thromboembolus

Answer & Comments

Answer: 4- Non-bacterial thrombotic endocarditis

Marantic endocarditis has platelet-fibrin thrombi that are prone to embolize. This form of non-infective endocarditis can be seen in persons who are very debilitated or who have a hypercoagulable state.



[Q: 4] OnExamination - Cardiology

A 67-year-old insulin dependent diabetic with a broad complex pulseless tachyarrhythmia (with a protected airway) has been defibrillated 3 times. He has just finished receiving 2 minutes of cardiopulmonary resuscitation and has received adrenaline.

Which of the following is the next step in the management of the arrest?

- 1- Adrenaline 1 mg
- 2- Amiodarone 300mg
- 3- DC shock
- 4- Lidocaine 100mg

- 5- Removal of oxygen and then DC shock

Answer & Comments

Answer: 2- Amiodarone 300mg

After 3 DC shocks and a further cycle of 2 mins of CPR the next step is Amiodarone 300mg intravenously and then a 4th shock. If amiodarone is not available lidocaine is a suitable alternative



[Q: 5] OnExamination - Cardiology

Which of the following statements concerning the treatment of acute myocardial infarction is correct?

- 1- A pansystolic murmur developing within the first 24 hours does not require further investigation.
- 2- Dipyridamole therapy reduces reinfarction within the first year.
- 3- Heparin is beneficial if given with streptokinase.
- 4- Prophylactic lidocaine given in the first 48 hours is effective in preventing ventricular fibrillation
- 5- Treatment with a dihydropyridine calcium antagonist is associated with increased cardiovascular mortality.

Answer & Comments

Answer: 5- Treatment with a dihydropyridine calcium antagonist is associated with increased cardiovascular mortality.

GISSI II revealed no survival advantage of heparin plus streptokinase in acute MI compared with strep alone. ISIS II revealed that dihydropyridine calcium antagonists were associated with increased cardiovascular risk after MI. Dipyridamole does not reduce risk. A newly discovered pansystolic murmur may signify acquired MR or VSD.



[Q: 6] OnExamination - Cardiology

Angina due to an imbalance between O_2 supply and demand without atherosclerosis would most likely be seen in which of the following circumstances?

- 1- aortic regurgitation
- 2- cardiac tamponade
- 3- pulmonary regurgitation
- 4- right heart failure
- 5- tricuspid regurgitation

Answer & Comments

Answer: 1- aortic regurgitation

Non-atherosclerotic angina would be associated with conditions such as thyrotoxicosis, aortic regurgitation, aortic stenosis, hypertrophic cardiomyopathy and anaemia to name but a few.



[Q: 7] OnExamination - Cardiology

A 57-year-old female school cleaner is undergoing investigation for breathlessness.

All the following would be in keeping with a diagnosis of constrictive pericarditis except

- 1- Elevated JVP with absent y descent
- 2- Peripheral oedema
- 3- Orthopnoea
- 4- Ascites
- 5- Previous cardiac surgery

Answer & Comments

Answer: 1- Elevated JVP with absent y descent

Constrictive pericarditis produces an elevated JVP, with prominent x and y descent. Pulsus paradoxus occurs less frequently than in tamponade. Other signs include oedema, ascites, hepatomegaly, orthopnoea and dyspnoea. Constriction can be a subtle cause of dyspnoea after cardiac surgery.



[Q: 8] OnExamination - Cardiology

A 62-year-old male is admitted with an inferior myocardial infarction and receives thrombolysis, aspirin, atenolol, simvastatin and lisinopril. His ECG shows good ST segment resolution. The following day he develops some pain in the legs and a dusky discolouration of the lower limbs. On closer examination there is a diffuse petechial rash over the lower legs particularly the feet but all peripheral pulses are palpable. Investigations reveal:

Haemoglobin	13.3 g/dl	(12-16)
Platelets	145 x 10^9 /L	(140-450)
White cell count	12.1 x 10^9 /L	(4-10)
Neutrophils	6.5 x 10^9 /L	(2-7)
Lymphocytes	3.5 x 10^9 /L	(1-3.5)
Eosinophils	1.2 x 10^9 /L	(0.3-0.6)
IgE antibody	3 mg/dl	(<2mg/dl)

Which of the following is the most likely cause for his current problems?

- 1- Allergic reaction to thrombolysis
- 2- Aspirin allergy
- 3- Cholesterol emboli
- 4- Peripheral vascular disease
- 5- Polyarteritis nodosa

Answer & Comments

Answer: 3- Cholesterol emboli

This patient is an arteriopath as suggested by the acute MI and one day after thrombolysis develops this petechial rash in the lower limbs with raised white cell count - marked eosinophilia and raised IgE. Rather than allergy, this suggests cholesterol embolisation syndrome. This case report provides all the information on cholesterol embolisation following treatment of IHD.



[Q: 9] OnExamination - Cardiology

A 29-year-old female presents with acute right sided weakness. She has one child aged 4 years and had two spontaneous abortions in the past. After the birth of her child she developed a DVT and required three months anticoagulation with warfarin. Examination revealed a right hemiparesis. A CT head scan showed a left middle cerebral artery territory infarct.

What is the most likely finding on echocardiography?

- 1- Atrial septal defect
- 2- Bicuspid aortic valve
- 3- Left atrial myxoma
- 4- Normal appearances
- 5- Ventricular septal defect

Answer & Comments

Answer: 4- Normal appearances

This patient has a prothrombotic tendency suggestive of the lupus anticoagulant with recurrent abortions, previous DVT and now she has developed a left hemiparesis. This has occurred off warfarin and it is highly unlikely to be due to any right to left transference of clot. It is more likely to be due to spontaneous infarct related to the thrombophilia and her heart is likely to be normal.



[Q: 10] OnExamination - Cardiology

A 59-year-old male has been discharged from hospital following an uncomplicated admission with myocardial infarction and treated with stenting. His therapy at discharge included aspirin 75 mg daily, ramipril 10mg daily, atenolol 50 mg daily and simvastatin 40 mg daily.

On subsequent review, 1 month after discharge he is well and unaware of any chest pain. His blood pressure is 134/78 mmHg and he has a resting heart rate is 66 bpm. There

are no abnormalities on auscultation of the heart or chest.

Investigations reveal:

Cholesterol	4.6 mmol/l
Triglyceride	0.8 mmol/l
Glucose	5.6 mmol/l
U+E	Normal

Which of the following therapies added to his current treatment regime would be expected to reduce mortality still further?

- 1- Amlodipine
- 2- Ezetimibe
- 3- Furosemide
- 4- Omega-3 fatty acids
- 5- Vitamin E

Answer & Comments

Answer: 4- Omega-3 fatty acids

Of the agents suggested, Omega-3 fatty acids (in essence fish oils) have been demonstrated in the GISSI-prevenzione study to reduce mortality in this particular group of patients with coronary artery disease on standard treatment by a further approximate 20% for all cause mortality and 40% reduction in sudden deaths vs controls. Whereas, vitamin E therapy was associated with no significant differences. It appears that Omega-3 Fish oils may have a benefit beside improving lipid profile with increases in HDL and reductions in triglyceride, as it has been suggested that they may confer some anti-arrhythmic effect. Short acting calcium antagonists early after MI possibly increase mortality and certainly have no beneficial effect. Similarly, Furosemide has no data to indicate improved outcome. Ezetimibe, which inhibits cholesterol reabsorption has no data to indicate a survival advantage.



[Q: 11] OnExamination - Cardiology

A 55-year-old man presents with gynaecomastia. He is receiving treatment for Heart failure and gastro-oesophageal reflux.

Which of the following drugs that he takes is most likely to be responsible for his gynaecomastia?

- 1- Amiloride
- 2- Carvedilol
- 3- Furosemide
- 4- Ranitidine
- 5- Ramipril

Answer & Comments

Answer: 4- Ranitidine

Like cimetidine, ranitidine is also associated with gynaecomastia. Omeprazole is associated with gynaecomastia although this is disputed. None of the other agents are associated. Other causes of gynaecomastia include spironolactone, digoxin, cimetidine, LHRH analogues and finasteride.



[Q: 12] OnExamination - Cardiology

A 60-year-old man had a myocardial infarction 6 weeks ago. He is taking aspirin 75 mg/day and metoprolol 50mg 2/day. During a routine follow-up Exercise Test he has a 20 beat run of non-sustained VT. He achieved stage 4 of the Bruce protocol and 92 % of his target heart rate. The non-sustained VT occurred halfway through Stage 2. ST segments were normal during the study.

What is the definitive investigation?

- 1- Coronary angiography.
- 2- Echocardiogram.
- 3- Electrophysiological study.
- 4- Thallium exercise scan.
- 5- 24 hour Holter monitor.

Answer & Comments

Answer: 3- Electrophysiological study.

Post MI VT is most commonly due to scar tissue. It may also be related to ischaemia but no signs of ischaemia were induced. The DEFINITIVE investigation would be EPS due to the fact that if this were scar related VT the site could be localised and even possibly ablated. If not then an ICD implantation may be warranted on MADIT criteria if LV dysfunction exists. Angio + Thallium may inform us of significant CAD but not offer us a solution to the problem. Echo would not be of much use apart from assessing LV function although in this patient one might assume that LV function is pretty good achieving stage IV of Bruce protocol, thus ECHO, although required would not be the definitive test and would be down on the selection list. There is no need for Holter as the VT has already been recorded.

The reference for MADIT is AmJCardiol 1997;79(suppl 6A):16-7. It was stopped early in 1996 by the steering committee due to extremely positive results in the ICD group. As a consequence it was only published in abstract form. However, MADIT-2 published in the NEJM (Ref: N Engl J Med 2002; 346:877-883, Mar 21, 2002) showed a 5.6% 20 month absolute survival benefit in patients with LV dysfunction (EF<30%) post MI treated prophylactically with an ICD.



[Q: 13] OnExamination - Cardiology

A 34-year-old man presented for an insurance medical. He was symptom free, but clinical examination suggested a small ventricular septal defect.

Which one of the following findings was most likely to have been present?

- 1- An early diastolic murmur
- 2- A short systolic murmur at the left sternal edge

- 3- A systolic murmur maximal at the apex
- 4- A systolic murmur with thrill at the left sternal edge
- 5- Fixed splitting of the second heart sound

Answer & Comments

Answer: 4- A systolic murmur with thrill at the left sternal edge

Typically, a small VSD generates a pansystolic murmur at the LSE accompanied by a thrill. The murmur may be heard at the apex but is usually loudest at the LSE. Very small defects may generate an early/late systolic murmur. Fixed splitting of the heart sounds usually accompanies atrial septal defects.



[Q: 14] OnExamination - Cardiology

A 75 year-old woman presents with a two month history of episodic loss of vision in her right eye. Her ECG was normal and carotid ultrasound reveal a 50% stenosis of the right internal carotid artery.

What is the most appropriate treatment for this patient?

- 1- Aspirin
- 2- Carotid endarterectomy
- 3- Dipyridamole
- 4- Prednisolone
- 5- Warfarin

Answer & Comments

Answer: 1- Aspirin

The patients experience TIA's of the form of amaurosis fugax due to carotid artery stenosis. Carotid endarterectomy is only indicated if the stenosis is 70-99%. Aspirin is the treatment of choice and good control of all vascular risk factors. Warfarin is not indicated unless the patient is in AF.



[Q: 15] OnExamination - Cardiology

A 74-year-old woman with longstanding hypertension and rheumatoid arthritis presented with dyspnoea. On examination she was in atrial fibrillation and was normotensive.

The jugular venous pressure was elevated. She had bilateral pitting lower limb oedema and ascites. Her echocardiogram showed normal left ventricular systolic function and bi-atrial enlargement.

What is the most likely diagnosis?

- 1- Constrictive pericarditis
- 2- Hypertensive heart disease
- 3- Hypothyroidism
- 4- Lymphatic obstruction
- 5- Pulmonary fibrosis

Answer & Comments

Answer: 1- Constrictive pericarditis

The combination of SOB, atrial fibrillation, lower limb oedema, ascites, raised JVP and bi-atrial enlargement with normal systolic ventricular function is typical of constrictive pericarditis. Hypertension is another cause of diastolic dysfunction but this lady is normotensive and hypertension would not create such dramatic clinical signs.

Further ECHO examination would reveal peak systolic and diastolic values decreasing with inspiration, and impaired diastolic function.

Constrictive pericarditis is associated with Rheumatoid Arthritis. Constrictive pericarditis can be a difficult clinical diagnosis. Read a case review of constrictive pericarditis.



[Q: 16] OnExamination - Cardiology

A 70-year-old female is reviewed in clinic after having had an anterior MI. Her echo reveals some left ventricular impairment. You are contemplating the

addition of a beta blocker to current therapy which consists of bendroflumethiazide, aspirin and simvastatin.

Which of the following Beta blockers should be avoided?

- 1- Bisoprolol
- 2- Carvedilol
- 3- Metoprolol
- 4- Propranolol
- 5- Sotalol

Answer & Comments

Answer: 5- Sotalol

Sotalol may prolong the QT interval and leads to a risk of ventricular arrhythmias. This can be a particular risk in individuals with hypokalaemia. The thiazide diuretic bendroflumethiazide predisposes to hypokalaemia due to its action on inhibiting potassium reabsorption in the distal tubules of the nephrons.



[Q: 17] OnExamination - Cardiology

A 75-year-old female is noted to have sustained hypertension with a blood pressure of 196/80 mmHg.

Which of the following is the most appropriate strategy for this patient?

- 1- ACE inhibitors would be contra-indicated in association with a creatinine above 150 micromols/l (50-100)
- 2- Antihypertensive therapy would be associated with only a minor reduction in risk of stroke in this age group
- 3- Beta blockers are less effective in this age group than in younger patients
- 4- Doxazosin would be the most appropriate initial treatment for this patient
- 5- The patient would only require a non-pharmacological approach as diastolic blood pressure is normal

Answer & Comments

Answer: 3- Beta blockers are less effective in this age group than in younger patients

This patient has isolated systolic hypertension with a persistent systolic BP over 140mmHg and diastolic BP below 90, this is associated with increased risk of stroke and coronary events in those over 60 years. This systolic hypertension should be lowered if persistent and is not responding to non-pharmacological measures, with calcium-channel blockers and thiazides as drugs of first choice. Elderly patients have a higher absolute cardiovascular risk than younger individuals and therefore benefit more from control of blood pressure. ACE inhibitors are not contraindicated when the serum creatinine is greater than 150umol/L but should be commenced under specialist supervision. There is evidence that beta blockers maybe less effective in elderly patients.



[Q: 18] OnExamination - Cardiology

A 51-year-old man with type 2 diabetes and no previous history of CHD presents at annual review. Currently he is taking metformin 500 mg bd, aspirin 75 mg od, perindopril 4 mg od and simvastatin 20 mg od. He has a blood pressure of 140/72 mm/Hg. On examination, his blood pressure is 140/72 mmHg, he has background diabetic retinopathy and has a peripheral sensory neuropathy to light touch in the feet. Investigations reveal:

HbA1c	7.1 %	(<6)
Total cholesterol	3.9 mmol/l	(<5.2)
Triglyceride	2.5 mmol/l	(0.5-1.7)
HDL-Cholesterol	0.8 mmol/l	(0.7-1.7)
LDL-Cholesterol	2.1 mmol/l	(<2.6)

Which is the most appropriate treatment for this man's dyslipidaemia?

- 1- Cholestyramine
- 2- Ezetimibe

- 3- Fenofibrate
- 4- No other treatment required
- 5- Rosuvastatin

Answer & Comments

Answer: 3- Fenofibrate

This patient's TC and LDL-C are at the currently advocated target levels. Current treatment targets advocate desirable HDL-C levels > 1 mmol/l and plasma TG < 1.7 mmol/l in subjects at risk of CVD. The FIELD study assessed the effects of fenofibrate therapy on CV mortality in patients with type 2 diabetes. Although the primary end-point of CV mortality was not achieved partly due to high use of non study lipid lowering therapies (statin use was much higher in placebo group 34% vs 18% in fenofibrate), although the composite endpoint of major CVD events was significantly reduced with fenofibrate. Furthermore, at any given LDL or TC level, reduced HDL-C is associated with an increased CHD risk. Fenofibrate increases HDL-C by 10 - 15% and reduces plasma TG by 15 - 20%. Concomitant fibrate-statin use is associated with an increased risk of myopathy so safety and tolerability evaluation of combination therapy is important. When evaluating a patient with hypertriglyceridaemia, secondary causes need to be considered these include hypothyroidism and poorly controlled diabetes as well as excess alcohol intake.



[Q: 19] OnExamination - Cardiology

A 69-year-old woman presented with an ulcer over the left ankle, which had developed over the previous 9 months. She had a history of right deep vein thrombosis five years previously. On examination she had a superficial slough-based ulcer, 6cms in diameter, over the medial malleolus with no evidence of cellulitis.

Which one of the following is the most appropriate next investigation?

- 1- ankle-brachial pressure index
- 2- bacteriological swab of the ulcer
- 3- bilateral lower limb arteriogram
- 4- right leg venogram
- 5- venous duplex ultrasound scan

Answer & Comments

Answer: 1- ankle-brachial pressure index

It has been reported that venous ulcerations are the most common type of ulcer affecting the lower extremities. The probable underlying cause of venous congestion, which may promote ulceration, is venous insufficiency. The treatment of venous ulceration is control of oedema, treating any infection, and compression. However, compressive dressings or devices should not be applied if the arterial circulation is impaired. It is thus important to identify any arterial disease, and ankle-brachial pressure index is a simple way of doing this. One may then progress to lower limb arteriogram if indicated. There is no clinical sign of infection, and although a bacterial swab would help to rule out pathogens within the ulcer, arterial insufficiency is the more important issue. If there is a clinical suspicion of DVT then duplex (or rarely a venogram) is indicated to decide on the indication for warfarin.



[Q: 20] OnExamination - Cardiology

A 62-year-old man suffered a myocardial infarction six weeks ago. He was taking soluble Aspirin 75mg daily and Metoprolol 50mg twice a day. During a follow up exercise test he had a 20 beat run of non-sustained ventricular tachycardia.

What is the next most appropriate investigation?

- 1- Coronary angiography
- 2- Echocardiography
- 3- Electrophysiological study

- 4- Thallium exercise scan
- 5- 24 hour Holter monitoring

Answer & Comments

Answer: 3- Electrophysiological study

The finding of NSVT puts this man at risk of sudden cardiac death. Structural heart disease would put him in a high risk group for sudden cardiac death, and in the clinical scenario described above, EPS is the most relevant next step. Holter monitoring would add little further information, prognostically at least. EPS would be required to assess whether the VT is inducible, which would have a bearing on therapy and potentially ablation could be used. ECHO adds little. Angiography would also be required to assess coronary circulation, given the likelihood of ischaemia-induced arrhythmia.



[Q: 21] OnExamination - Cardiology

Left atrial myxoma may be associated with all except-

- 1- Sudden death
- 2- A mid systolic click
- 3- Systemic emboli
- 4- Left atrial dilatation
- 5- Adrenal hyperplasia

Answer & Comments

Answer: 2- A mid systolic click

Atrial myxoma in the heart make up 50% of primary cardiac tumours. They are most common in the left atrium arising from a pedicle on the fossa ovalis. On third present with emboli, a third with systemic inflammation (ESR elevated in 1/3) and a third are asymptomatic when detected. The can intermittently flop through the mitral valve, and cause a mid-diastolic click (tumour plop) when they stop moving. Elevated left atrial pressures cause dilatation. Syncope can occur

due to obstruction. They are more common in women.

Carney complex is a familial multiple neoplasia and lentiginosis syndrome associated with primary adrenal hypercortisolism, lentigenes and naevi of the skin, various tumours including myxoma.



[Q: 22] OnExamination - Cardiology

A 25-year-old female who is 20 weeks pregnant with her first child is admitted with palpitations. The ECG reveals a Supraventricular tachycardia and this self terminates 20 minutes after admission. Subsequently she has further runs of symptomatic SVT.

What would be the most appropriate treatment for this patients paroxysmal supraventricular tachycardia?

- 1- Amiodarone
- 2- Disopyramide
- 3- Flecainide
- 4- Metoprolol
- 5- Verapamil

Answer & Comments

Answer: 4- Metoprolol

Tachyarrhythmias may increase during pregnancy although the causes are not entirely clear. Regarding the termination of acute SVT adenosine appears to be safe in pregnancy. In the case of the prevention of recurrent SVT then verapamil or beta blockers have data supporting their use. Current AHA/EHA criteria for the treatment of SVTs in pregnancy do suggest using metoprolol (level of evidence 1B) rather than Verapamil (C) although recommend avoiding the former in the first trimester.



[Q: 23] OnExamination - Cardiology

Which one of the following is a

recognised feature of abetalipoproteinaemia?

- 1- a high serum cholesterol
- 2- palmar xanthomas
- 3- advanced atherosclerotic vascular disease
- 4- abnormal red blood cell morphology
- 5- Severe mental retardation

Answer & Comments

Answer: 4- abnormal red blood cell morphology

Acanthocytes are seen in abetalipoproteinaemia.

Retinitis pigmentosa is seen in abetalipoproteinaemia. Neurodegenerative changes are seen such as ataxia but IQ is normal.

**[Q: 24] OnExamination - Cardiology**

A 14-year-old boy presents with hypertension.

Which of the following statements concerning hypertension in the young is true?

- 1- Sodium nitroprusside is useful for the long-term treatment of severe cases.
- 2- Headache is the usual presenting feature.
- 3- It is defined as systolic blood pressure above the 99th centile for age.
- 4- Abnormalities are frequently seen on DMSA scan.
- 5- Aortic coarctation is the commonest secondary cause.

Answer & Comments

Answer: 4- Abnormalities are frequently seen on DMSA scan.

D Sodium nitroprusside is useful only in the short term, as cyanide levels accumulate with time. Hypertension is usually diagnosed incidentally, and is defined as systolic blood pressure >95th centile for age. Secondary

causes are usually due to renal abnormalities, with reflux associated scarring being the commonest renal disease. This will cause abnormalities on DMSA scan. Coarctation of the aorta is the commonest non-renal cause, with pheochromocytoma/neuroblastoma, congenital adrenal hyperplasia, Cushing Syndrome and steroid therapy being rarer causes.

**[Q: 25] OnExamination - Cardiology**

A 35-year-old male presents with chest pain on exertion. On examination she has yellow discolouration of her palmar creases and a diagnosis of remnant Hyperlipidaemia (type III hyperlipidaemia) is made.

What is the cause of this hyperlipidaemia?

- 1- Apo CIII homozygosity
- 2- Apo E-2 homozygosity
- 3- LCAT deficiency
- 4- LDL receptor deficiency
- 5- Lipoprotein lipase deficiency

Answer & Comments

Answer: 2- Apo E-2 homozygosity

Remnant hyperlipidaemia is associated with hypercholesterolaemia,

hypertriglyceridaemia, palmar xanthomata and early onset of cardiovascular disease. The genotype of the condition is apo E-2/E-2 and occurs with a frequency of 1:100. LDL receptor deficiency is associated with familial hypercholesterolaemia. Lipoprotein lipase deficiency is rare and associated with marked hypertriglyceridaemia.

**[Q: 26] OnExamination - Cardiology**

A 43- year-old gentleman develops chest pain 7 minutes after fiberoptic bronchoscopy. The procedure had been performed without sedation following an

intratracheal injection of 5 ml 2.5% cocaine solution and xylocaine spray to the pharynx for topical anaesthesia. ECG showed an evolving anterior myocardial infarction.

Which of the following would you prefer for his management?

- 1- Beta blockers
- 2- Nitrates
- 3- Percutaneous transluminal coronary angioplasty
- 4- Thrombolysis with rt-PA
- 5- Thrombolysis with streptokinase

Answer & Comments

Answer: 2- Nitrates

The underlying mechanism here is vasoconstriction, not thrombosis. Cocaine is cardiotoxic and its use has been linked to coronary artery spasm, angina, myocardial infarction, arrhythmias, sudden cardiac death, and myocardial contraction bands, which might act as a substrate for arrhythmias. It is important to avoid β -blockers in treating cocaine induced chest pains or acute myocardial infarctions as this may result in unopposed α adrenergic action with worsening coronary spasm. Calcium channel antagonists or nitrates should be administered as early as possible.



[Q: 27] OnExamination - Cardiology

A 66-year-old man has developed chronic renal failure with a serum urea of 60 mmol/L and creatinine of 650 micromol/L. Auscultation of the chest reveals a friction rub over the cardiac apex.

He is most likely to have a pericarditis that is termed?

- 1- Constrictive
- 2- Fibrinous
- 3- Hemorrhagic

- 4- Purulent
- 5- Serous

Answer & Comments

Answer: 2- Fibrinous

The uraemia leads to exudation of fibrin onto the epicardial and pericardial surfaces. Haemorrhagic pericarditis is more typical of tuberculosis or metastatic tumour. Serous pericarditis is more typical of collagen vascular diseases.



[Q: 28] OnExamination - Cardiology

A 60-year-old man presents with an inferior MI and receives thrombolysis. 4 hours following initial presentation he becomes acutely breathless. His ECG demonstrates sinus tachycardia (rate 108bpm) with T wave inversion inferiorly. His ST segments are normal. On examination his JVP is elevated at 5 cm. Chest was clear to auscultation. Following 80 mg of Furosemide he deteriorates. His BP is now 80/60 and his urine output over the last 2 hours is 5 mls.

What is the best investigative measure?

- 1- Arterial Blood Gases
- 2- Central Venous Pressure Monitoring
- 3- Chest X-Ray
- 4- Echocardiography
- 5- Pulmonary Capillary Wedge Pressure Monitoring

Answer & Comments

Answer: 5- Pulmonary Capillary Wedge Pressure Monitoring

The scenario is that of a right ventricular MI. The treatment in this situation is fluid to increase LVEDP and not furosemide, which worsens the situation. The best way to determine if adequate fluid is being given is using a Swan Ganz catheter to monitor PCWP

(a surrogate for Left Atrial pressure). While CVP monitoring is also helpful, CVP is increased in LV failure due to infarct as well so would not help to monitor treatment. Echocardiography would show a small volume LV with a dilated RV.



[Q: 29] OnExamination - Cardiology

75 year-old man with a history of anterior MI is taking amiodarone 400mg/day for history of VT. He has a prolonged QT interval on his ECG.

What is the most appropriate management?

- 1- Admit to hospital for monitoring.
- 2- Atenolol.
- 3- Change amiodarone to flecainide.
- 4- Continue with amiodarone.
- 5- Discontinue amiodarone immediately.

Answer & Comments

Answer: 5- Discontinue amiodarone immediately.

In iatrogenic long QT which is what this is likely to be, it is safer to stop the offending drug rather than add further drugs on board (eg B-blockers even though Atenolol is used for long QT). Flecainide is clearly contraindicated in this situation (CAST study).



[Q: 30] OnExamination - Cardiology

A 62-year-old male who is being treated for stable angina presents with muscle aches and pains. He has been taking simvastatin 40 mg daily, atenolol 50 mg daily together with aspirin 75 mg daily for approximately two years. Recently he was admitted for an episode of acute coronary syndrome and a number of other therapies were added. You suspect a statin related myopathy and a CPK concentration is 820 iu/l (50-200).

Which of the following is most likely to be responsible for the precipitation of his statin related myopathy?

- 1- Bisoprolol
- 2- Clopidogrel
- 3- Diltiazem
- 4- Omega-3 fatty acids
- 5- Spironolactone

Answer & Comments

Answer: 3- Diltiazem

Statin associated myopathy occurs in up to 5% of those treated with statins and may be exacerbated by the co-prescription of other drugs such as Calcium channel blockers, macrolide antibiotics, fibrates, amiodarone and Grapefruit juice! Whilst patients may tolerate a statin extremely well, a myopathy or rhabdomyolysis can quite easily be precipitated by the addition of these agents.



[Q: 31] OnExamination - Cardiology

Which of the following concerning congenital heart disease is correct?

- 1- ASD is the commonest malformation at birth
- 2- congenital complete heart block is usually associated with Anti-Ro antibodies in the mother
- 3- Ebstein's anomaly is associated with maternal exposure to lithium carbonate
- 4- Hypoplastic left heart syndrome is characterised by a large, dilated left ventricle
- 5- Osteogenesis imperfecta is associated with aortic stenosis

Answer & Comments

Answer: 3- Ebstein's anomaly is associated with maternal exposure to lithium carbonate

A VSD is the commonest at 30%, ASD is 10%. Aortic regurgitation may be a feature of Osteogenesis imperfecta. Ebstein's anomaly is associated with maternal LiCO₃ use if exposed in the first trimester. In the vast majority of cases of neonates with complete heart block the cause is unknown but in the minority it may be caused by autoimmune disease, particularly Anti-Ro antibodies, in the mother. LV Hypoplasia occurs when the left sided chambers fail to develop and blood enters the systemic circulation from the right ventricle via the pulmonary artery and a patent ductus arteriosus.



[Q: 32] OnExamination - Cardiology

Which of the following may be responsible for a hypokalaemic hypertension

- 1- Non-classical congenital adrenal hyperplasia
- 2- Barter's syndrome
- 3- Diabetic nephropathy
- 4- Liddle's syndrome
- 5- Type IV renal tubular acidosis

Answer & Comments

Answer: 4- Liddle's syndrome

Liddle's syndrome is typically associated with hypokalaemic hypertension and low renin and aldosterone concentrations - the so called pseudo-hyperaldosteronism. Barter's syndrome is associated with hypokalaemia though hypertension is not a feature. In type IV RTA, there is a hyporeninaemic hypoaldosteronism, which may also be produced with diabetic nephropathy. Hence hyperkalaemia is more typical.



[Q: 33] OnExamination - Cardiology

A 27-year-old fit and healthy male has an ECG as part of his medical examination for employment as a pilot. The ECG reveals a

delta waves indicating Wolf Parkinson White Syndrome.

What is the most appropriate treatment for this patient?

- 1- Atenolol
- 2- Flecainide
- 3- Radio-frequency ablation
- 4- Reassurance
- 5- Verapamil

Answer & Comments

Answer: 4- Reassurance

WPW is a relatively common cardiological abnormality occurring in approx 0.1 to 3% of the population. It is due to an accessory pathway and although most subjects are asymptomatic, there is the small risk of sudden death from tachyarrhythmias (<0.6%). Treatment is based on risk stratification. One of the pointers is symptomatology and also electrophysiological studies. Generally, in an asymptomatic individual it is uncertain whether any intervention or indeed any EPS is required. Radiofrequency ablation is the treatment of choice in those identified to be at risk.



[Q: 34] OnExamination - Cardiology

A 51-year-old businessman complains of dyspnoea on exertion. He recently returned from a business trip to the USA. He has distant heart sounds on auscultation of the chest. A chest radiograph reveals that there is a thin rim of calcification surrounding the cardiac outline.

Which of the following conditions is most likely responsible for these findings?

- 1- Uraemia
- 2- Tuberculosis
- 3- Group B coxsackie virus
- 4- Sarcoidosis

5- Metastatic carcinoma

Answer & Comments

Answer: 2- Tuberculosis

The most likely diagnosis is a constrictive pericarditis. The most probable cause for this is previous tuberculous infection which may have occurred many years previously. Acute TB would usually cause a constrictive pericarditis secondary to a pericardial effusion, but is not normally associated with calcification. Uraemia can cause a constrictive pericarditis, as can a pericardial malignancy, and coxsackie virus (secondary to a pericarditis) but calcification would be unusual. Sarcoid can cause both pericardial as well as restrictive cardiomyopathy but calcification would be unusual.



[Q: 35] OnExamination - Cardiology

A 35-year-old shop worker presents with pain in her calves which develops after 50 yards of walking. The pain settles with rest. On examination she has yellow discolouration of her palmar creases. Her fasting lipid profile reveals:

Cholesterol 9.6 mmol/l (less than 5)

Triglycerides 7.3 mmol/l (less than 2)

What is the likely diagnosis?

- 1- Chylomicronaemia
- 2- Familial hyperlipidaemia
- 3- Hypoalphalipoproteinaemia
- 4- Type III hyperlipidaemia
- 5- Type IV hyperlipidaemia

Answer & Comments

Answer: 4- Type III hyperlipidaemia

Remnant hyperlipidaemia (Type III hyperlipidaemia) is associated with elevated fasting cholesterol (usually >7.8mmol/l) and triglyceride levels (usually >5.0mmol/l). It

presents with palmar xanthomata and early onset cardiovascular disease (CHD, PVD and CVA). Hypoalphalipoproteinaemia is a rare, familial condition and is associated with low HDL. Chylomicronaemia is associated particularly with hypertriglyceridaemia and not with large elevations in cholesterol. Familial hyperlipidaemia is due to LDL-receptor deficiency, and is not associated with elevated triglyceride levels.



[Q: 36] OnExamination - Cardiology

Which of the following findings is the most specific for a diagnosis of myocardial infarction?

- 1- an akinetic area of LV wall motion on ECHO
- 2- elevated cardiac enzymes
- 3- evolution of Q waves on ECG
- 4- history of severe chest pain
- 5- ST elevation on ECG

Answer & Comments

Answer: 3- evolution of Q waves on ECG

Cardiac enzymes may be elevated in PE, Renal failure and raised ST segments associated with pericarditis. Akinetic wall motion on the echo may occur with any regional disease process like amyloid etc. The evolution of Q waves is the most suggestive of an infarct.



[Q: 37] OnExamination - Cardiology

A 30-year-old intravenous drug abuser develops acute aortic regurgitation due to infective endocarditis.

Which of the following is not typical of acute aortic regurgitation?

- 1- normal cardiac output
- 2- decrescendo diastolic murmur
- 3- hypotension
- 4- mitral valve pre-closure
- 5- peripheral vasodilatation

Answer & Comments

Answer: 5- peripheral vasodilatation

Findings that would be typical include large pulse volume, increased pulse pressure, a decrescendo murmur and a low diastolic blood pressure. Vasoconstriction not dilatation is typically found.



[Q: 38] OnExamination - Cardiology

A 65-year-old female presents with a four hour history of fatigue and palpitations. On examination she is vomiting, and is noted to have a slight tremor, some lid lag and has an irregularly irregular pulse of 140 per minute, with some fine basal crackles. ECG confirms atrial fibrillation with a rate of approximately 130 per minute. Thyroid function tests show: Free T₄ 31.8 pmol/l (9-22) TSH 0.05 mu/l (0.5-4.5)

Which of the following is the most appropriate initial treatment for this patient?

- 1- Anticoagulation
- 2- DC cardioversion
- 3- IV amiodarone
- 4- IV digoxin
- 5- IV Metoprolol

Answer & Comments

Answer: 4- IV digoxin

Atrial fibrillation occurs in 5-15% of patients with thyrotoxicosis. The most appropriate immediate treatment for this patient with fast atrial fibrillation and a degree of failure would be digoxin either IV which acts within 30 minutes or oral. Although patients may be relatively resistant to digoxin the drug should still be used in association with failure. AF associated with Thyrotoxicosis often spontaneously reverts to sinus rhythm when euthyroidism is restored, hence cardioversion should be withheld until antithyroid medication has been successful. All patients

with atrial fibrillation associated with thyrotoxicosis should be anticoagulated due to the high risk of thromboembolism. However, in this case it is first important to control the fast AF. Beta blockers would probably not be the best option here in view of the heart failure. If this were absent beta blockers IV would be the best choice.



[Q: 39] OnExamination - Cardiology

Which ONE of the following statements is true about the Austin Flint murmur?

- 1- It is associated with a loud first heart sound.
- 2- It is an early sign of aortic regurgitation
- 3- It can be distinguished from the murmur of mitral stenosis by absence of presystolic accentuation
- 4- It is due to partial closure of the anterior leaflet of the mitral valve
- 5- It does not occur in aortic incompetence secondary to an aortitis

Answer & Comments

Answer: 4- It is due to partial closure of the anterior leaflet of the mitral valve

The Austin Flint murmur is a low frequency mid/late diastolic murmur which may show pre-systolic accentuation and is virtually indistinguishable from that of mitral stenosis. It is due to partial closure of the anterior leaflet of the mitral valve by the regurgitant jet. There is no correlation between presence of murmur and severity of AR, or aetiology. The first heart sound is normal but in severe cases, it may be absent.



[Q: 40] OnExamination - Cardiology

A 75-year-old lady presents with sudden breathlessness and palpitations. On examination, she was observed to have an irregular heart beat with rate of 140 bpm, BP 150/84 and normal heart sounds. On

auscultation of the chest, Fine basal crepitations are heard. An ECG confirms AF and an old inferior MI. She is anticoagulated with heparin and given diuretics. Her heart rate remains rapid.

What is the most appropriate management of the lady's AF?

- 1- DCCV
- 2- IV amiodarone
- 3- IV betablocker
- 4- IV digoxin
- 5- Oral quinidine therapy

Answer & Comments

Answer: 2- IV amiodarone

The key to this question is that the patient has clinical signs of pulmonary oedema with fast AF. In this age group AF is poorly tolerated and often leads to pulmonary oedema even in the presence of a relatively normal LV. NICE have published guidance on the treatment of AF. The primary aim here should be rate control which is best achieved with Amiodarone in this situation. Digoxin even when used IV is suggested to have too slow an onset of action to merit its use. Betablockers can also be used but due to the fact that they are negatively inotropic may complicate the acute pulmonary oedema. Emergency DCCV is not required as there is no haemodynamic compromise (BP) yet. Amiodarone allows DCCV to remain an option if haemodynamic compromise develops. It may be possible to cardiovert this patient in the long term depending on duration in AF, LA size, LVF, LVID etc. Check this reference out - M Bilal Iqbal, Anil K Taneja, Gregory Y H Lip, and Marcus Flather. Recent developments in atrial fibrillation BMJ, Jan 2005; 330: 238 - 243



[Q: 41] OnExamination - Cardiology

What is Troponin?

- 1- A component of thick filaments

- 2- A component of thin filaments
- 3- A myosin heavy chain
- 4- A myosin light chain
- 5- A substance produced by pulmonary vascular endothelium

Answer & Comments

Answer: 2- A component of thin filaments

Troponin is a component of thin filaments (along with actin and tropomyosin), and is the protein to which calcium binds to accomplish this regulation. Troponin has three subunits, TnC, TnI, and TnT. When calcium is bound to specific sites on TnC, the structure of the thin filament changes in such a manner that myosin (a molecular motor organized in muscle thick filaments) attaches to thin filaments and produces force and/or movement. In the absence of calcium, tropomyosin interferes with this action of myosin, and therefore muscles remain relaxed.



[Q: 42] OnExamination - Cardiology

In a normal heart, the oxygen saturation of a sample of blood taken from a catheter in the pulmonary capillary wedge position should be equal to a sample from which of the following?

- 1- coronary sinus
- 2- femoral artery
- 3- pulmonary artery
- 4- right atrium
- 5- right ventricle

Answer & Comments

Answer: 2- femoral artery

Pulmonary capillary wedge normal values reflect pressures and saturations of the left side of the heart. Consequently wedge pressures are between 6-12 mmHg and the

saturations of blood taken from the wedged source reflects blood in the pulmonary vein and hence high sats similar to that seen in the femoral artery.



[Q: 43] OnExamination - Cardiology

A 29-year-old female with Turner syndrome is referred by the GP concerned about her blood pressure which he has found to be persistently elevated at between 140-160/90 mmHg. On examination she is noted to have a blood pressure of 148/92 mmHg, with no radio-femoral delay and no murmur audible.

Which of the following is the most likely cause of her hypertension?

- 1- Coarctation of the aorta
- 2- Essential hypertension
- 3- Primary hyperaldosteronism
- 4- Renal artery stenosis
- 5- Single horseshoe kidney

Answer & Comments

Answer: 2- Essential hypertension

Hypertension is quite common in Turner syndrome (10%) and is typically idiopathic - essential. In a small proportion causes can include coarctation of the aorta and renal dysfunction due to horseshoe kidney. In this case, essential hypertension is the most likely cause but in the absence of specific features of coarctation this would again be the most appropriate option.



[Q: 44] OnExamination - Cardiology

A 29-year-old male is admitted with a one hour history of severe central chest pain associated with vomiting. It transpires that he used cocaine three hours ago. His Blood pressure is 142/74 mmHg and a pulse of 110 beats per minute regular. His ECG reveals 3 mm ST segment elevation in leads V2-5.

Which of the following is the most appropriate treatment for this patient?

- 1- Abciximab
- 2- Angiography +/- PTCA
- 3- Isoket infusion
- 4- Low molecular weight heparin
- 5- Tissue plasminogen activator (rtPA)

Answer & Comments

Answer: 2- Angiography +/- PTCA

Cocaine is a drug of widespread abuse and remains one of the commonest causes of acute myocardial infarction in men below 35 years of age. The aetiology of cocaine induced MI is speculated to be related to coronary artery spasm as many patients do not have overt coronary artery disease. Consequently guidelines recommend angiography with PTCA where appropriate in these patients.



[Q: 45] OnExamination - Cardiology

A 60-year-old female presents with a 4 week history of low grade fever, dyspnoea and fatigue. Two months ago she received a prosthetic valve replacement for mitral regurgitation. On examination she has a temperature of 37.7°C. At trans-oesophageal echocardiography vegetations are seen.

A clinical diagnosis of prosthetic valve endocarditis is made.

Which of the following is the most likely causative organism?

- 1- Actinomyces
- 2- Candida albicans
- 3- Enterococci
- 4- Staphylococcus aureus
- 5- Streptococcus viridans

Answer & Comments

Answer: 4- Staphylococcus aureus

Generally there are two identifiable modes of prosthetic valve endocarditis. The first occurs within the first year after surgery affecting 0.7-3% of cases and is often due to staphylococci. Late endocarditis observed after two years post surgery is found in 0.5 - 1% of cases and is typically due to streptococci- typically group A haemolytic otherwise known as strep viridans.



[Q: 46] OnExamination - Cardiology

A 55-year-old male with ischaemic heart disease is seen for review. He reports that he has developed some muscle aches and pains and you attribute this to a myalgia associated with simvastatin. His Creatinine kinase is within the normal range. However, his dyslipidaemia is still sub-optimal and you wish to add in a further agent.

Which of the following agents would not be an appropriate additional therapy for this patient in view of his presentation?

- 1- Cholestyramine
- 2- Ezetimibe
- 3- Gemfibrozil
- 4- Nicotinic acid
- 5- Omega-3 fatty acids

Answer & Comments

Answer: 3- Gemfibrozil

This patient presents with a probable statin induced myalgia which often improves with time. Sometimes stopping therapy briefly or re-introducing a different statin may resolve the myalgia. Statin induced myositis is relatively uncommon occurring in approximately 0.1-0.2%. But, the risk of myositis and the potentially fatal rhabdomyolysis is increased with Gemfibrozil, in prone subjects in combination with a statin and as such should be avoided. Additional agents could include Omega-3 fatty acids and Ezetimibe. Nicotinic acid is less used due to

problems with flushing though can be useful particularly in hypertriglyceridaemia. Cholestyramine can also be used.



[Q: 47] OnExamination - Cardiology

Which of the following statements regarding B-type natriuretic peptide (BNP), is correct?

- 1- BNP is synthesised predominantly in the cerebrovascular circulation
- 2- The stimulus for BNP release is increased ventricular pressure load
- 3- BNP synthesis is decreased by thyroid hormone
- 4- BNP causes arterial and venous smooth muscle vasodilatation
- 5- BNP augments sodium reabsorption in the kidney

Answer & Comments

Answer: 4- BNP causes arterial and venous smooth muscle vasodilatation

The ventricular myocardium is the primary site of BNP synthesis. The stimulus for BNP release is myocyte stretch, rather than transmural pressure load. BNP synthesis is increased by thyroid hormones as well as glucocorticoids, endothelin-1, angiotensin-II and tachycardia, independent of the haemodynamic effects of these factors. In the kidney, BNP causes increased GFR and inhibition of sodium reabsorption leading to natriuresis and diuresis. BNP leads to reduced blood pressure, and reduced pre-load due to relaxing effects on vascular smooth muscle. For an informative review refer to Lancet 2003;362:316-22.



[Q: 48] OnExamination - Cardiology

A 60-year-old man takes atenolol for hypertension.

Which of the following side effects is he most likely to be aware of two hours after taking atenolol?

- 1- Fatigue
- 2- Hesitancy of micturition
- 3- Nausea
- 4- Orthostatic hypotension
- 5- Somnolence

Answer & Comments

Answer: 1- Fatigue

Atenolol is a water soluble beta blocker, taken once daily and is not associated with drowsiness/sleep disturbance like the lipid-soluble β -blockers. It is not associated with nausea or hesitancy of micturition and would be unlikely to produce significant postural hypotension in a hypertensive subject. However, fatigue is a frequent side effect which typically is felt two hours and beyond after taking the drug.



[Q: 49] OnExamination - Cardiology

A 70-year-old male with a 5 year history of type II diabetes mellitus presents for annual review with a blood pressure of 188/88 mmHg. Clinical examination was normal. An ECG reveals evidence of left ventricular hypertrophy.

Which one of the following drugs is the most appropriate treatment for this patient's hypertension?

- 1- Atenolol
- 2- Amlodipine
- 3- Bendroflumethiazide
- 4- Doxazosin
- 5- Valsartan

Answer & Comments

Answer: 5- Valsartan

Regarding the British Hypertensive Society guidelines and NICE guidelines on the treatment of BP in T2D, this elderly male diabetic has isolated systolic hypertension associated with LVH (LVH being defined as a complication of hypertension). Evidence would support the use of a calcium channel blocker and/or ACEi as first line (see ab-cd rule in BMJ 2004;328:634-40). In a diabetic patient with evidence of nephropathy or any patient with LVH there is compelling evidence to suggest that ACEi or angiotensin II receptor blockers should be first line treatment for hypertension.



[Q: 50] OnExamination - Cardiology

An 87-year-old woman was referred to clinic with a two-month history of alternating constipation and diarrhea, night sweats and fatigue. The patient was not sure if she had lost any weight.

On examination she appeared thin and pale. Pulse 80/minute and regular. A systolic murmur was audible at the apex, radiating to the axilla. No diastolic murmurs were heard.

Investigations

Blood cultures: positive

Transthoracic echocardiogram revealed a vegetation on the mitral valve

What is the most likely causative organism in this case?

- 1- Coagulase-negative Staphylococcus
- 2- Staphylococcus aureus
- 3- Streptococcus bovis
- 4- Streptococcus mitis
- 5- Streptococcus viridans

Answer & Comments

Answer: 3- Streptococcus bovis

This patient clearly has endocarditis! In addition to the symptoms that might be attributed to endocarditis (fatigue, night

sweats), she also has a history of altered bowel habit that is very suggestive of an underlying malignancy. *Streptococcus bovis* is a normal commensal of the GI tract. However, *S. bovis* bacteraemia and endocarditis has a strong association with GI malignancy.

Coagulase-negative staphylococcal endocarditis is exceptionally rare in native valve endocarditis, though is the commonest cause of prosthetic valve endocarditis in the postoperative period. *Staphylococcus aureus* endocarditis is typically the result of a focus of *Staphylococcal* infection (e.g skin abscess). *Streptococcus mitis* endocarditis. Viridans streptococci (which include *S. mitis*) are normal commensals of the oropharynx and GI tract; endocarditis is usually associated with poor dental hygiene; overall, *Streptococcus viridans* accounts for ~40% of cases of endocarditis.



[Q: 51] OnExamination - Cardiology

A paper describes a new diagnostic test for myocardial infarction. You want to know what proportion of patients who are classified as not having had a myocardial infarction by the test will actually not have had a myocardial infarction.

Which one of the following measurements would indicate this?

- 1- accuracy
- 2- negative predictive value
- 3- positive predictive value
- 4- sensitivity
- 5- specificity

Answer & Comments

Answer: 2- negative predictive value

The proportion of 'true negatives' not having had a MI correctly identified by this test is called the Negative predictive value and refers to the number accurately identified to not have MI by the new test over the number

without MI identified by the test + those wrongly identified as not having had an MI. specificity is the number without MI accurately predicted. Sensitivity refers to the number correctly identified with MI by the new test. A positive predictive value refers to the number accurately identified with MI by the test over the number accurately identified with MI + those wrongly identified with MI.



[Q: 52] OnExamination - Cardiology

A 40-year-old man received an orthotopic cardiac transplant 7 years ago to treat a dilated cardiomyopathy. Since that time he has been healthy, with no episodes of rejection or infection. Over the next year, however, he develops fatigue with exercise. He has worsening pedal edema and orthopnea. On physical examination, his vital signs are Temperature 36.3°C, Pulse 78, Respiratory rate 16, and BP 130/70 mm Hg. There are no murmurs, rubs, or gallops audible. Bibasilar crackles in the lungs are audible.

Which of the following conditions is most likely to account for these findings?

- 1- Angiosarcoma
- 2- Coronary arteriopathy
- 3- Mitral valvular stenosis
- 4- Myocarditis
- 5- Pulmonary hypertension

Answer & Comments

Answer: 2- Coronary arteriopathy

By 5 years following cardiac transplantation, nearly all patients have some degree of small coronary vascular narrowing. Myocarditis is unlikely to be present in the absence of rejection or infection.



[Q: 53] OnExamination - Cardiology

A 17-year-old female presents after

taking an overdose of her grandmother's medication.

Investigations revealed:

Serum potassium 6 mmol/L (3.5-4.9)

Which one of the following drugs is the most likely cause of this abnormality?

- 1- Aspirin
- 2- Digoxin
- 3- Fluoxetine
- 4- Omeprazole
- 5- Propranolol

Answer & Comments

Answer: 5- Propranolol

Betablockers, particularly propranolol, in overdose can cause hyperkalaemia by transmembrane shifts. It is useful to think of the opposite - beta-agonists such as salbutamol are far more widely known to cause hypokalaemia.

Overdose of digoxin therapy most commonly manifests as rhythm disturbance, and may be exacerbated by hyper- or hypokalaemia. Salicylate overdose causes metabolic acidosis and respiratory alkalosis.



[Q: 54] OnExamination - Cardiology

A 65-year-old was advised to start oral digoxin at a dose of 250 µg daily. His physician explained that the full effect of this treatment would not be apparent for at least a week.

Which one of the following pharmacokinetic variables did the physician use to give this explanation?

- 1- bioavailability
- 2- half-life
- 3- plasma protein binding
- 4- renal clearance
- 5- volume of distribution

Answer & Comments

Answer: 2- half-life

Digoxin follows first order kinetics and has a half life of 1.6 days in a patient with normal renal function. 65% of the drug absorbed remain in the system after one day. Subsequent doses gradually accumulate until a steady state is achieved after 4 to 5 days.



[Q: 55] OnExamination - Cardiology

Which of the following is first to rise following myocardial infarction?

- 1- Creatine Phosphokinase
- 2- CK-MB
- 3- Lactate dehydrogenase
- 4- Myoglobin
- 5- Troponin I

Answer & Comments

Answer: 4- Myoglobin

Myoglobin, is a sensitive indicator of muscle injury and is first to rise following MI within 2 hrs but is non specific. Troponin and CK-MB both begin to rise approximately 3 hrs after MI. Both are far more specific of Myocardial injury. LDH begins to rise approximately 12 hrs after MI.



[Q: 56] OnExamination - Cardiology

A 55-year-old man with Type 2 Diabetes Mellitus and Ischaemic Heart Disease has been researching the Internet! He asks your opinion on Laser Transmyocardial Revascularisation.

Which of the following statements about this technique is true?

- 1- avoids the need for major surgery
- 2- damages the endocardium
- 3- involves destruction of coronary stenoses

- 4- is of particular use in severe proximal coronary artery disease
- 5- stimulates collateral vessel formation

Answer & Comments

Answer: 2- damages the endocardium

Open chest surgery is undertaken during which laser holes are punched from the epicardial surface into areas of suspected ischaemic or hibernating ventricular muscle. The process is not fully understood. The epicardial end of the hole heals up leaving artificial channels communicating with the ventricular chamber and effectively forming new coronary vessels.

Laser transmyocardial revascularisation has potential in distal disease such as in Diabetes - Angioplasty and CABG are useful in proximal disease.



[Q: 57] OnExamination - Cardiology

Which of the following antiarrhythmic drugs may be used in the treatment of long QT syndrome?

- 1- Amiodarone
- 2- Atenolol
- 3- Flecainide
- 4- Propofanone
- 5- Sotalol

Answer & Comments

Answer: 2- Atenolol

Beta blockers are the mainstay of treatment in long QT syndrome. The most commonly used drugs are propranolol and nadolol but metoprolol and atenolol are also used. Implantable Cardioverter-Defibrillators are the most effective treatment in high risk cases. The others drugs may produce a prolongation of the QT interval exacerbating risk of polymorphic VT and Torsades de pointes. For

a list of drugs see QTdrugs.org. For an example of long QT syndrome



[Q: 58] OnExamination - Cardiology

Elevation of the jugular venous pressure during inspiration is most likely to be found in which of the following situations?

- 1- a normal physical exam
- 2- cardiac tamponade
- 3- constrictive pericarditis
- 4- dilated cardiomyopathy
- 5- myocarditis

Answer & Comments

Answer: 3- constrictive pericarditis

Kussmaul's sign (a rise in jugular venous pressure on inspiration - the opposite to normal) is seen in both Constrictive Pericarditis and Pericardial Tamponade but it is more likely to be present in the former. However, neither of these are the commonest cause ... can anyone name that



[Q: 59] OnExamination - Cardiology

A 27-year-old woman presented with a history of sudden onset right-sided weakness and dysphasia lasting 8 hours. She had returned to the UK from Australia 2 days previously. There was no significant past medical history and physical examination was normal. Chest X-ray, ECG and a CT head scan were all normal.

Which one of the following investigations is most likely to reveal the underlying cause of this episode?

- 1- Carotid doppler ultrasonography
- 2- Cerebral angiography
- 3- MRI of head
- 4- Transoesophageal echocardiography
- 5- Transthoracic echocardiography

Answer & Comments

Answer: 4- Transoesophageal echocardiography

The history here suggests a lower limb deep vein thrombosis with peripheral embolus through a patent foramen ovale, leading to a left sided cerebrovascular event. This is termed the paradoxical embolus - so-called because a thromboembolus arising from the venous circulation can end up in the systemic circulation.

Transoesophageal echocardiography is the investigation of choice to investigate for a patent foramen ovale, although transthoracic echocardiography with contrast may be an alternative.



[Q: 60] OnExamination - Cardiology

A 45-year-old HIV-seropositive man attended the outpatient clinic for the results of a fasting serum lipid test. He had been diagnosed with HIV disease two years previously and was started on highly active antiretroviral therapy. One year after commencing antiretrovirals, his CD4 count had risen from 10 cells/mm³ to 120 cells/mm³ with an undetectable viral load. His current medications consisted of zidovudine, lamivudine lopinavir, aciclovir, fluconazole and co-trimoxazole.

Fasting lipid profile revealed:

Serum cholesterol 4.1 mmol/L (<5.2)

Serum triglyceride 18.2 mmol/L (0.5 - 1.7)

Which of the following medications is most likely to be responsible for these results?

- 1- Co-trimoxazole
- 2- Fluconazole
- 3- Lamivudine
- 4- Lopinavir
- 5- Zidovudine

Answer & Comments

Answer: 4- Lopinavir

Lipodystrophy, lipoatrophy and alterations in serum lipid values have been observed in patients with HIV disease taking highly active antiretroviral therapy. Elevated serum lipid levels have been associated with premature coronary artery disease. Hypertriglyceridemia is also thought to contribute to central fat deposition, and insulin resistance that is also seen in these patients.

Abnormalities of serum lipid levels are likely to be multifactorial in patients with HIV disease, but appear much commoner in patients taking protease inhibitors. Isolated hypertriglyceridemia can occur in HIV disease in the absence of protease inhibitors, but extremely high serum triglycerides have been documented in some patients treated with these drugs.

If the elevation in lipid levels is modest, measures such as dietary modification and exercise may be tried first. Omega-3 fish oils may also be beneficial in reducing modestly-elevated serum triglycerides. In refractory cases, or where there is extreme isolated hypertriglyceridemia, a fibrate should be used. In addition, patients with HIV disease may also have elevated serum lipid levels due to familial hyperlipidaemia.



[Q: 61] OnExamination - Cardiology

A 65-year-old is investigated for dyspnoea and is shown to have an ejection fraction of 45% on echocardiography.

How is left ventricular ejection fraction calculated?

- 1- Cardiac output/stroke volume
- 2- End systolic volume/end diastolic volume
- 3- End diastolic volume/end systolic volume
- 4- End diastolic volume/stroke volume
- 5- Stroke volume/end diastolic volume

Answer & Comments

Answer: 5- Stroke volume/end diastolic volume

The left ventricle pumps only a fraction of the blood it contains. The ejection fraction is the amount of blood pumped (stroke volume=end diastolic volume - end systolic volume) divided by the amount of blood the ventricle contains (end diastolic volume). A normal ejection fraction is more than 55% of the blood volume.



[Q: 62] OnExamination - Cardiology

A 45-year-old man is admitted with central crushing chest pain, sweating and vomiting of 1 hour duration. He is conscious with a pulse rate of 100bpm and a blood pressure of 200/125mmHg. An ECG shows > 2mm ST elevation in leads I, II, aVL and V2-6. CBC: normal, U & E: normal. Troponin T: 100ng/ml. Apart from the presence of xanthelasma (+) there are no other positive findings on clinical examination. He is given oxygen, aspirin, morphine and intravenous 5mg atenolol.

What will you do next?

- 1- CABG
- 2- Nitroprusside infusion
- 3- PTCA
- 4- Thrombolysis with rt-PA
- 5- Thrombolysis with streptokinase

Answer & Comments

Answer: 3- PTCA

It is a case of acute myocardial infarction. Typically thrombolysis should be carried out in the absence of any contraindications. BP > 200/120 is one of the contraindication. So the next appropriate management in this case is urgent angioplasty for extensive anterolateral infarction. BP control should follow suit.



[Q: 63] OnExamination - Cardiology

A 74-year-old man presented with intermittent chest pain at rest.

Which one of the following would most strongly suggest that the pain was due to myocardial ischaemia?

- 1- Associated dyspnoea
- 2- Coexistent claudication
- 3- Past history of cigarette smoking
- 4- Radiation of pain to the jaw
- 5- Relief of pain by sublingual nitrate

Answer & Comments

Answer: 4- Radiation of pain to the jaw

Nitrates may relieve the pain of oesophageal spasm, as well as that of myocardial ischaemia. Associated dyspnoea may be due to anxiety.

Coexistent claudication suggests the presence of peripheral vascular disease. A past history of cigarette smoking is a risk factor for the development of cardiovascular disease.

However, the most specific feature of the given options which suggests that the pain is myocardial ischaemia, is the radiation to the jaw, which is relatively specific for pain of myocardial ischaemia.



[Q: 64] OnExamination - Cardiology

Which ONE of the following is associated with Marfan's syndrome?

- 1- Autosomal recessive inheritance
- 2- increased upper : lower body ratio
- 3- Mental retardation
- 4- Pulmonary stenosis
- 5- Retinal detachment

Answer & Comments

Answer: 5- Retinal detachment

Marfan's syndrome is an autosomal dominant condition associated with ocular abnormalities such as upwards lens dislocation and retinal detachment. Aortic regurgitation may be a finding and aneurysmal dilatation is a feature. Upper to lower body ratio (head to symphysis pubis : Symphysis pubis to toes) is decreased in Marfan Syndrome.



[Q: 65] OnExamination - Cardiology

A randomised double-blind placebo controlled study of a cholesterol-lowering drug for the primary prevention of coronary heart disease was conducted. It had a five-year follow up period.

The results showed an absolute risk of myocardial infarction in the group-receiving placebo during was 10 per cent. The relative risk reduction of those given the cholesterol lowering medication was 0.8.

Approximately what number of patients will need to be treated with the drug for five years to prevent one myocardial infarction?

- 1- 10
- 2- 13
- 3- 15
- 4- 20
- 5- 23

Answer & Comments

Answer: 2- 13

This is a question concerning Number Needed to Treat (NNT). The calculation involves a little arithmetic. The absolute risk of MI in the group is a pretty high 10% i.e of 1000 patients on placebo 100 will have MI over 5 years. The relative risk reduction is stated as 0.8 i.e 80%. Therefore, if you treat 1000 patients for 5 years with the cholesterol lowering agent you'll get only 20 MIs. Thus, for 1000 patients treated you'll get 80 fewer MIs. Thus Number Needed to Treat to get 1 fewer MI is 1000/80

= 12.5. Or, if you're any good at remembering formulae you can remember the following: -
 1. Relative risk reduction (RRR) = Absolute risk reduction (ARR) / Control event rate (CER)
 2. Numbers needed to treat (NNT) = 1 / Absolute risk reduction (ARR)
 You can then just insert the figures into these formulae. The control (or placebo) event rate (CER) is 10% or 0.10. The relative risk reduction is 0.80. Inserting these figures into the above formulae....
 $RRR = ARR / CER$
 $0.80 = ARR / 0.10$
 $ARR = 0.80 * 0.10 = 0.08$
 Then the NNT can be calculated by
 $NNT = 1 / ARR = 1 / 0.08 = 12.5$.
 However, if algebra isn't your thing you could try working with real numbers. Imagine a group of 100 patients (it makes the maths easier) In the control (or placebo group) 10% (or 10 patients) suffered an MI. The relative risk reduction is 0.8 or 80%. Therefore, in the treatment group, there would be a reduction in events by 80% (of 10 patients) = 8 patients. The number of patients suffering an MI in the treatment would therefore be 10 - 8 = 2 patients. It can therefore be said that treating 100 patients with the new drug would result in 8 fewer MIs. The number needed to treat to prevent one MI would be 100/8 = 12.5 patients.



[Q: 66] OnExamination - Cardiology

Which of the following infections is least likely to cause myocarditis?

- 1- Coxsackie virus
- 2- Diphtheria
- 3- Chagas Disease
- 4- Syphilis
- 5- Toxoplasmosis

Answer & Comments

Answer: 4- Syphilis

Quaternary syphilis involves the cardiovascular system commonly in form of ascending aortic aneurysm and aortic regurgitation. Diphtheria, coxsackie virus,

Chagas disease and toxoplasmosis are all associated with myocarditis.



[Q: 67] OnExamination - Cardiology

In Down syndrome, which is the commonest congenital heart defect?

- 1- Atrial septal defect
- 2- Atrioventricular septal defect
- 3- Patent ductus arteriosus
- 4- Tetralogy of Fallot
- 5- Ventricular septal defect

Answer & Comments

Answer: 2- Atrioventricular septal defect

50% of Down syndrome births have congenital heart disease. Defects in order of decreasing frequency are: B, E, C, D and A.



[Q: 68] OnExamination - Cardiology

A 21-year-old man with Hypertrophic Cardiomyopathy presents in clinic with dizzy spells but has not had any syncopal episodes.

Which of the following, if present, would be indicate an increased risk of sudden cardiac death?

- 1- Asymmetric septal hypertrophy with maximum wall thickness of 2.1 cm
- 2- Blood Pressure drop of 20mmHg during peak exercise tolerance testing
- 3- Left Ventricular Outflow Tract Gradient of 80 mmHg
- 4- Systolic Anterior Movement of the mitral valve on echocardiography
- 5- Worsening exertional angina

Answer & Comments

Answer: 2- Blood Pressure drop of 20mmHg during peak exercise tolerance testing

Patients with Hypertrophic Cardiomyopathy (HCM) are at increased risk of sudden cardiac death due to VF/VT. The five poor prognostic markers which are predictive of sudden cardiac death are:

1. Syncope
2. Family History of HCM and sudden cardiac death
3. Maximum Left Ventricular Wall Thickness >3cm
4. BP drop during peak exercise on stress testing
5. Documented runs of Non-Sustained VT on 24 hour tape.

LVOT obstruction causes symptoms and can lead to deterioration of LV function but does not predict sudden cardiac death. Asymmetric Septal Hypertrophy is a feature of HCM, in order to assess the risk for sudden cardiac death a detailed echocardiogram with measurements of the maximum left ventricular wall thickness is required. Systolic anterior movement of the mitral valve is often seen on echocardiogram and is thought to be the mechanism behind the left ventricular outflow tract obstruction.



[Q: 69] OnExamination - Cardiology

Which of the following compounds has a vasodilating effect?

- 1- Antidiuretic hormone
- 2- Calcitonin
- 3- Endothelin
- 4- Renin
- 5- Somatostatin

Answer & Comments

Answer: 2- Calcitonin

ADH acts on the Vasopressor receptors to cause vasoconstriction. Endothelin is also a

vasoconstrictor as is renin. Somatostatin is also recognised to produce vasoconstriction of the splanchnic system.



[Q: 70] OnExamination - Cardiology

A 70-year-old woman is referred with hypertension. Despite lifestyle advice, her GP notes blood pressure recordings averaging 170/100 mmHg. She was commenced on an antihypertensive but one month later complains of symptoms suggestive of postural hypotension.

Which one of the following is most likely to be responsible for this side effect?

- 1- amlodipine
- 2- atenolol
- 3- bendroflumethiazide
- 4- doxazosin
- 5- lisinopril

Answer & Comments

Answer: 2- atenolol

Odd question as all the agents can cause postural hypotension but one might think that the causative agent would be an α -blocker. However, the evidence suggests the contrary as amongst all the classes a β -blocker is most associated with postural hypotension in the elderly. So, the correct answer is a β -blocker yet it's a lottery to determine if the RCP would have this down as their right answer. Other agents particularly associated with postural hypotension include the centrally acting agents like alpha Methyl Dopa and reserpine.



[Q: 71] OnExamination - Cardiology

You are asked to see a patient in the Intensive Care Unit who is short of breath and tachycardic to rule out a cardiac cause of her symptoms. A right heart catheter reveals that the mixed venous O_2 saturation is 70%; the pulmonary capillary wedge O_2 saturation is

97%. The haemoglobin is normal and the patient is afebrile.

Which of the following is the most appropriate statement that could be applied to her features?

- 1- her cardiac output is decreased
- 2- her cardiac output is normal
- 3- her heart is normal
- 4- she has high-output failure
- 5- she is in shock due to a non-cardiac cause

Answer & Comments

Answer: 2- her cardiac output is normal

The right heart and wedge catheters show normal sats, the latter suggesting that she has good pulmonary oxygenation and so these features would argue against any failure - decreased or high output failure and would certainly argue against shock of any sort. Therefore, one cannot go as far as to say that she has a normal heart, so the best response (by a process of elimination) is that she has a normal output.



[Q: 72] OnExamination - Cardiology

A 78-year-old female is referred by her GP with high blood pressure. Over the last three months her blood pressure is noted to be around 180/80 mmHg. She has a body mass index of 25.5 kg/m², is a non-smoker.

There are no features to suggest a secondary cause for her hypertension.

Which of the following is the most appropriate treatment for her blood pressure?

- 1- Alpha-Blocker
- 2- Angiotensin Converting Enzyme (ACE) Inhibitor
- 3- Angiotensin Blocker
- 4- Beta-blocker
- 5- Calcium channel blocker

Answer & Comments

Answer: 5- Calcium channel blocker

This patient has isolated systolic hypertension (systolic BP >160 and diastolic BP <90) which is the typical hypertension in the elderly population and is associated with a greater risk than combined systolic/diastolic hypertension. Based upon studies such as SHEP and Syst-Eur, guidelines suggest treatment with either Calcium antagonists or diuretics.



[Q: 73] OnExamination - Cardiology

A 23-year-old male presents with a deep vein thrombosis. He has no past medical history but his mother has suffered from deep vein thromboses.

Which of the following is likely to be found on haematological assessment?

- 1- Factor V Leiden mutation
- 2- Protein S deficiency
- 3- Protein C deficiency
- 4- Antithrombin deficiency
- 5- Lupus anticoagulant

Answer & Comments

Answer: 4- Antithrombin deficiency

Antithrombin deficiency is an autosomal dominant condition present in 0.02 - 1.1% of the population and is found in 4% of subjects that present with a thromboembolism.

Factor V Leiden is a possibility although seems less likely as the inheritance pattern seems more likely to be AD. Similarly as the son had a DVT this would be far less likely with FVLeiden than ATIII as thrombosis is more often precipitated in females on the OCP.

See (Simioni P, Sanson BJ, Prandoni P, et al. Thromb Haemost 1999 Feb;81(2):198-202) who show that "The annual incidences of total and spontaneous venous thromboembolic

events in carriers of AT, PC or PS defects (n=181) were 1.01% and 0.40%, respectively, as compared to 0.10% and 0.04% in non-carriers, respectively (relative risks both 10.6). In carriers of Factor V Leiden (n= 224), the annual incidences of total and spontaneous venous thromboembolism were 0.28% and 0.11%, respectively, as compared to 0.09% and 0.04% in non-carriers, respectively (relative risks 2.8 and 2.5)."

See also "Risk of a first venous thrombotic event in carriers of a familial thrombophilic defect. The European Prospective Cohort on Thrombophilia (EPCOT)."



[Q: 74] OnExamination - Cardiology

A post-marketing surveillance study of a new heart failure therapy to the market was carried out on 10,000 subjects who had completed clinical trials.

Which one of the following most accurately reflects the information generated from such a study?

- 1- Adverse events profile
- 2- Cost benefit analysis
- 3- Cost effectiveness
- 4- Comparative therapeutic efficacy
- 5- Drug potency

Answer & Comments

Answer: 1- Adverse events profile

Post-marketing surveillance/observational studies (phase IV studies) generally are designed to assess the potential side effects of new drugs but under everyday conditions and with a minimum of intervention. In contrast to the randomized controlled trials, PMS typically include patients from more extreme age groups, patients with comorbidity or other risk factors. In order to cover a wide spectrum of patients and to observe rare events with sufficiently high probability, PMS enroll a large number of patients, typically several

thousands. Comparative efficacy has already been undertaken in Phase III studies (RCTs) but can also be undertaken as part of specific RCT studies later in the drugs development and potency usually in phase I and II studies.



[Q: 75] OnExamination - Cardiology

A 60-year-old man's echocardiogram shows a dilated left ventricular cavity with the remainder of the other chamber sizes normal.

The most likely diagnosis is which of the following?

- 1- aortic regurgitation
- 2- aortic stenosis
- 3- hypertensive heart disease
- 4- mitral regurgitation
- 5- mitral stenosis

Answer & Comments

Answer: 1- aortic regurgitation

No echocardiographic data are provided regarding the valves but a volume overload as with AR would result in dilatation of the left ventricle. MR, AS, and hypertension would have the effect of causing hypertrophy and a smaller LV cavity. MS would have little effect on LV dimensions.



[Q: 76] OnExamination - Cardiology

Which of the following is true regarding the coronary circulation?

- 1- Adenosine is an important mediator of metabolic vasodilation.
- 2- Coronary blood flow is independent of myocardial oxygen consumption due to autoregulation.
- 3- Coronary blood flow within a normal range of blood pressure is primarily determined by perfusion pressure.
- 4- Increased myocardial O₂ demand is met primarily by increasing O₂ extraction.

- 5- The vasodilatory reserve of the epicardium and endocardium is equivalent under normal physiologic conditions.

Answer & Comments

Answer: 1- Adenosine is an important mediator of metabolic vasodilation.

Adenosine has a particularly short half-life, acts on specific adenosine cell surface receptors (A₁ and A₂) and is inactivated by adenosine deaminase. It results in coronary vasodilatation and depression of sinus node automaticity and AVN conduction.

Coronary blood flow is dependent on myocardial oxygen consumption and is pretty independently maintained throughout the ranges of blood pressure. Increasing O₂ demands are met by increased blood supply facilitated by vasodilatation brought about by adenosine production.



[Q: 77] OnExamination - Cardiology

A 24-year-old woman develops infective endocarditis involving the aortic valve. She receives a porcine bioprosthesis because of her desire to have children and not to take anticoagulant medication. After ten years, she must have this prosthetic valve replaced.

Which of the following pathologic findings in the bioprosthesis has most likely led to the need for replacement?

- 1- Calcification with stenosis
- 2- Dehiscence
- 3- Infective endocarditis
- 4- Strut failure
- 5- Thrombosis

Answer & Comments

Answer: 1- Calcification with stenosis

The bioprosthesis has the advantage of not requiring anticoagulation, but it does not wear well with time, and typically must be replaced within 5 to 10 years.



[Q: 78] OnExamination - Cardiology

A 74-year-old patient with a history of ischaemic heart disease presents with shortness of breath. He is finding difficulty mobilising any further than around his home. An ECHO demonstrates an ejection fraction of approximately 20%. He is on maximal drug therapy for heart failure, and is not thought to have an infective chest exacerbation. The ECG demonstrates sinus rhythm, with a rate of 75/min and widened QRS complexes.

What is the most appropriate treatment option?

- 1- Addition of Perhexiline therapy
- 2- Palliation as an inpatient with PRN morphine
- 3- Referral for implantable defibrillator
- 4- Referral for biventricular pacing
- 5- Referral for cardiac transplant

Answer & Comments

Answer: 4- Referral for biventricular pacing

This patient by definition has NYHA III heart failure. The CARE-HF study of heart failure patients has shown a 37% reduction in the primary endpoint of death and cardiovascular hospitalization and a reduction of 36% in all-cause mortality compared with control. Control patients were treated with maximal medical therapy only, and follow-up was a mean of 29 months. Examination of the COMPANION study demonstrates a 40% reduction in the risk of death or hospitalization from HF, and a 36% reduction in death from any cause, after implantation of biventricular pacing wires with a defibrillator. It may be that in the very near future we will be implanting biventricular pacing devices,

with defibrillator actions, in those patients to the subject groups included in these studies. The indications for implantation devices in these studies were low ejection fraction, dyssynchrony on the ECG (widened QRS), and NYHA III/IV. Perhexiline therapy may become standard therapy in this patient subgroup in the future, but as yet there is no mortality or morbidity evidence to support its widespread use.



[Q: 79] OnExamination - Cardiology

A 73-year-old male is referred with palpitations. On 24 hr ambulatory ECG monitoring he is shown to have paroxysmal atrial fibrillation and is treated with amiodarone.

Through blockade of which of the following receptors is the antiarrhythmic effect of amiodarone most attributed?

- 1- Alpha receptors
- 2- Beta receptors
- 3- Calcium channels
- 4- Potassium channels
- 5- Sodium channels

Answer & Comments

Answer: 4- Potassium channels

Amiodarone is a class III antiarrhythmic and as such is used in many supra and ventricular arrhythmias. Its antiarrhythmic effects are due mostly to the inhibition of the rapid component of the delayed potassium rectifier IKr channel (as with sotalol) but also an effect on the slow component. However, it is also recognised to have a mild alpha blocking effects, beta-blocking effects and calcium channel blocking effects although these are less responsible for the antiarrhythmic effects.



[Q: 80] OnExamination - Cardiology

A 35-year-old woman presents with

fever, rigors, malaise and weight loss. She had undergone prosthetic valve replacement 1 month before. C3 level was reduced and echocardiography showed small vegetations.

Which microorganism is most likely to be responsible for this?

- 1- Candida
- 2- Coxiella burnetii
- 3- Staphylococcus aureus
- 4- Staphylococcus epidermidis
- 5- Streptococcus viridans

Answer & Comments

Answer: 4- Staphylococcus epidermidis

Prosthetic valve endocarditis arising within 2 months of valve surgery is generally the result of intraoperative contamination of the prosthesis or a bacteraemia postoperative complication. The nosocomial nature of these infections is reflected in their primary microbial causes: coagulase-negative staphylococci (Staphylococcus epidermidis), S. aureus, facultative gram-negative bacilli, diphtheroids, and fungi. The oral cavity, skin, and upper respiratory tract are the respective primary portals for the viridans streptococci, staphylococci, and HACEK organisms (Haemophilus, Actinobacillus, Cardiobacterium, Eikenella, and Kingella) causing community-acquired native valve endocarditis. Streptococcus bovis originates from the gastrointestinal tract, where it is associated with polyps and colonic tumors, and enterococci enter the bloodstream from the genitourinary tract.



[Q: 81] OnExamination - Cardiology

A 70-year-old male is referred by his GP for management of recently diagnosed congestive heart failure. The patient has a history of poorly controlled hypertension. Over the last three months he has been aware of deteriorating shortness of breath, fatigue,

and orthopnea. Over the last month he had been commenced on Digoxin (62.5 micrograms daily), Furosemide (80 mg daily), and amiloride 10 mg.

On examination he has a pulse of 96 bpm regular, a blood pressure of 132/88 mmHg. His JVP was not raised, he had some scattered bibasal crackles on auscultation with a displaced apex beat in the anterior axillary line, 6th intercostal space. Auscultation of the heart revealed no murmurs and he had peripheral oedema to the mid tibia.

Investigations showed:

Serum sodium 144 mmol/L

Serum potassium 3.5 mmol/L

Serum urea 17 mmol/L

Serum creatinine 175 umol/L

Serum digoxin 0.7 ng/mL (therapeutic range 1.0-2.0)

One month previously his urea had been 11 mmol/L and creatinine 110 micromol/L. An ECG reveals left ventricular hypertrophy and Chest X-ray shows cardiomegaly and calcified aorta.

What is the most appropriate next step in management?

- 1- Add an ACE inhibitor to the current regimen
- 2- Add atenolol at a dose of 25mg daily
- 3- Increase digoxin to 0.25 mg daily
- 4- Increase furosemide to 80 mg twice daily
- 5- Maintain on current therapy.

Answer & Comments

Answer: 1- Add an ACE inhibitor to the current regimen

This patient would be classified as probably NYHA grade III heart failure (dyspnoeic at rest). With the persisting symptoms despite 80mg of furosemide, guidelines would initially suggest the addition of an ACE inhibitor. Although there has been a mild decline in his

U+Es since the introduction of therapy this would not be a contra-indication to the use of ACEis. There is no evidence that increasing a dose of digoxin above 62.5 micrograms in a patient in sinus rhythm would have any added benefit. Although β -blockers would be of further benefit in this patient, it is important first to establish him on ACEi and then introduce β -blockers like carvedilol, metoprolol or bisoprolol in a small dose and gradually increase.



[Q: 82] OnExamination - Cardiology

A 75-year-old male is admitted with chest pain and dyspnoea. His troponin T is 0.5 (NR <0.02 ng/ml). His pain subsides and he is generally well, although dyspnoea restricts his mobilisation. He is unable to manage the stairs, but can mobilise solely around the ward. Whilst being monitored his telemetry demonstrates short runs of non sustained ventricular tachycardia, associated with light-headedness.

What is the next most appropriate investigation for this patient?

- 1- 24hr tape
- 2- Coronary angiography
- 3- Echocardiography
- 4- Electrophysiological studies
- 5- Outpatient Cardiology referral

Answer & Comments

Answer: 3- Echocardiography

This question is a nod to the recent evidence suggesting that patients with reduced LV function and asymptomatic VT may benefit from implantation of an implantable cardiac defibrillator (eg the MADIT study). You need to know the patients cardiac function, and we feel that an ECHO would be the next most appropriate study in this patient, followed by coronary angiography and inpatient cardiology referral.



[Q: 83] OnExamination - Cardiology

A 60-year-old male with a 8 year history of type 2 diabetes is being treated with Metformin 1g bd and gliclazide 80 mg daily. He is obese, has gained weight over the last year and his HbA1c has deteriorated from 7.5 to 7.9%. His GP wishes to stop the gliclazide and treat him with Rosiglitazone. The patient wants to know the side effects of Rosiglitazone.

Which of the following would be regarded as a typical side effect of Rosiglitazone therapy?

- 1- Acanthosis nigricans
- 2- Fluid retention
- 3- Lactic acidosis
- 4- Myositis
- 5- Photosensitivity rash

Answer & Comments

Answer: 2- Fluid retention

Rosiglitazone like other PPAR gamma agonists such as Pioglitazone may cause fluid retention (about 10%) and this can be minimized by avoiding agents that may exacerbate fluid retention such as calcium antagonists. Other side effects include mild GI upset, dyspepsia, flatulence and initial weight gain (often related to fluid retention. Due to this effect, it should be avoided in patients with cardiac failure. Lactic acidosis is a recognised effect of metformin, sulphonylureas may cause a photosensitivity rash, acarbose causes GI upset and statins/fibrates are associated with myositis.



[Q: 84] OnExamination - Cardiology

A 17-year-old girl was found collapsed and drowsy. Her 12-lead ECG showed a sinus tachycardia of 120 beats per minute with a corrected QT interval of 500 ms (normal <470).

Which of the following drugs is the most likely cause of her presentation?

- 1- Amphetamine
- 2- Diphenhydramine
- 3- Glue sniffing
- 4- Methadone
- 5- Methanol

Answer & Comments

Answer: 2- Diphenhydramine

You are given here the option of choosing between two drugs that can possibly cause prolongation of QT - diphenhydramine and methadone. However, bearing in mind that she has collapsed and drowsy with a tachycardia, the most likely option is diphenhydramine as the tachycardia is more typical. Many drugs can cause a prolonged QT interval.



[Q: 85] OnExamination - Cardiology

A 19-year-old woman presents to the clinic having had 5 blackouts over the last year, all while she is standing up. She gets warnings of blurred vision, nausea, feeling hot. She had been witnessed twice to have jerking of all limbs while she is unconscious. The attacks last 30-60 seconds. She recovers quickly after the attacks. She has never bitten her tongue or sustained any injuries. Physical examination and an ECG are normal. Her grandmother and sister suffer from epilepsy.

Which of the following investigations is the most appropriate?

- 1- EEG
- 2- 24 hour ECG recording
- 3- CT brain
- 4- ECHO
- 5- Tilt table test

Answer & Comments

Answer: 5- Tilt table test

The most likely diagnosis is vasovagal syncope. The gradual onset of the attack is typical. It is common for patients with syncope to have jerking of their limbs while they are unconscious. Warning symptoms of darkening/blurring of vision, dizziness, feeling hot, is characteristic in syncope. Patients usually recover very quickly after the event. Tilt table test is a useful test to support the diagnosis of vasovagal syncope.



[Q: 86] OnExamination - Cardiology

A 66-year-old insulin dependent diabetic with a treated potassium of 5.4 mmol/l (3.5-5) and palpitations develops pulseless ventricular tachycardia. The anaesthetist is supporting Airway and Breathing.

Which of the following is the next step in his management?

- 1- Adrenaline 1mg
- 2- Amiodarone 300mg
- 3- Cardiopulmonary resuscitation 15:2 for 2 mins
- 4- Defibrillation at 150J biphasic
- 5- Praecordial thump

Answer & Comments

Answer: 4- Defibrillation at 150J biphasic

In the case of ventricular tachycardia and ventricular fibrillation immediate defibrillation is the treatment of choice. The other options come further down the algorithm and CPR is now recommended at 30:2. A praecordial thump can be administered immediately following a witnessed cardiac arrest.



[Q: 87] OnExamination - Cardiology

A 55-year-old female who had a long

history of alcohol abuse presents with diarrhoea and back pain one month after having a pacemaker inserted. On examination she had a fever of 39°C and her abdomen was soft and non-tender.

What is the most likely diagnosis?

- 1- Diverticulitis
- 2- Ischaemic colitis
- 3- Pancreatitis
- 4- Pseudomembranous colitis
- 5- Staphylococcal discitis

Answer & Comments

Answer: 5- Staphylococcal discitis

All patients with alcohol dependence have an increased risk of pancreatitis, but this is less likely without any abdominal signs. Ischaemic colitis classically presents with bloody diarrhoea. The prophylactic antibiotics given 4 weeks previously for his pacemaker insertion would not really have predisposed her to pseudomembranous colitis. Staphylococci are skin organisms most commonly introduced during pacemaker insertion and such a discitis would present with back pain.



[Q: 88] OnExamination - Cardiology

On auscultation of the heart of a 30-year-old female a loud first heart sound is heard.

Which of the following may be responsible for this auscultatory feature?

- 1- a long preceding diastolic interval
- 2- Atrial premature beat
- 3- increased pulmonary arterial pressure
- 4- increased systemic arterial pressure
- 5- rupture of a papillary muscle

Answer & Comments

Answer: 2- Atrial premature beat

A loud first heart sound is due to abrupt closure of the mitral valve against a high left atrial pressure and may occur with shortened diastole, mitral stenosis or left-right shunts. It can also be heard with atrial premature beats. MR occurs with papillary muscle rupture and thereby 1st heart sound is soft. A2 and P2 are loud in systemic HT and pulmonary hypertension respectively.



[Q: 89] OnExamination - Cardiology

A 35-year-old healthy woman has a faint systolic murmur on physical examination. An echocardiogram is performed, and she is found to have a bicuspid aortic valve.

In explaining the meaning of this finding to her, the most appropriate statement is that?

- 1- An aortic valve replacement is eventually likely to be required.
- 2- Other family members are likely to have the same condition
- 3- She should be treated with a cholesterol-lowering agent
- 4- The problem resulted from past injection drug usage
- 5- This is one manifestation of an underlying autoimmune disease process

Answer & Comments

Answer: 1- An aortic valve replacement is eventually likely to be required.

Bicuspid aortic valve is perhaps the most common form of congenital heart disease in adults (1-2% of population). Bicuspid valves have a propensity to wear out and calcify with aging. Bicuspid aortic valve tends to be a sporadic although there is a reported familial incidence of approx 9%. From a review of several sources in the literature, the Aeromedical Consultation Service (ACS) at Brooks AFB calculated a 1.2% per year incidence of aortic valve surgery in individuals

with BAV, although the vast majority occur in the 5th and 6th decades of life.



[Q: 90] OnExamination - Cardiology

A 72-year-old man presents with an episode of collapse. He has had two similar episodes recently, each lasting about one minute. Four years ago he suffered an anterior myocardial infarction.

On examination he was orientated and symptom-free with a regular pulse rate of 80 bpm, BP 140/80 mmHg and the apex beat was displaced to the left. There was an apical systolic murmur. There were no signs of trauma. ECG showed sinus rhythm, Q waves and ST segment elevation anteriorly without reciprocal depression.

What is the diagnosis?

- 1- acute anterior myocardial infarction
- 2- cerebrovascular accident
- 3- epileptic seizure
- 4- pulmonary embolism
- 5- ventricular tachycardia

Answer & Comments

Answer: 5- ventricular tachycardia

The ECG is suggestive of a left ventricular aneurysm, which has a tendency for both an malignant arrhythmogenic focus and also for left ventricular thrombus. The brief episode of loss of consciousness with no residual neurology makes the diagnosis for cerebral embolism unlikely. The story is more suggestive of a ventricular tachycardia and would suggest further investigations. Prolonged heart rhythm monitoring and an echo are recommended. If VT is proven then he should be on amiodarone and the indication for an automated implantable cardioverter/defibrillator strongly considered if the overall LV function is reduced.



[Q: 91] OnExamination - Cardiology

A 50-year-old politician presented with a strange fluttering sensation in his chest, but no chest pain. The symptoms had lasted 24 hours. An ECG revealed atrial fibrillation with a ventricular rate of 130 beats per minute.

Which one of the following drugs is most likely to restore sinus rhythm?

- 1- Adenosine
- 2- Bisoprolol
- 3- Digoxin
- 4- Flecainide
- 5- Verapamil

Answer & Comments

Answer: 4- Flecainide

Flecainide is the drug most likely to restore sinus rhythm in atrial fibrillation. Care is required in patients who may have LV dysfunction, although this is unlikely in a previously fit, relatively young patient. Adenosine is used to cardiovert supraventricular tachycardia (SVT). Digoxin and Bisoprolol are indicated for rate control and are not normally associated with the restoration of sinus rhythm. Verapamil can be used for rate control in atrial fibrillation, and may be used in the treatment of SVT.



[Q: 92] OnExamination - Cardiology

Which ONE of the following is true regarding acute pulmonary embolism?

- 1- a normal ECG excludes the diagnosis
- 2- embolectomy is more effective than thrombolysis in improving survival
- 3- Heparin is as effective as thrombolytic therapy
- 4- the presence of hypoxaemia is an indication for thrombolysis

- 5- thrombolysis administered through a peripheral vein is as effective as through a pulmonary artery catheter

Answer & Comments

Answer: 5- thrombolysis administered through a peripheral vein is as effective as through a pulmonary artery catheter

Embolectomies are rarely done nowadays due to the excellent results with thrombolysis. Thrombolytic therapy is reserved for those with severely compromised circulation (equally effective through peripheral vein or via catheter in pulmonary artery). Heparin reduces risk of further embolism (anticoagulant) and reduces pulmonary vasoconstriction.



[Q: 93] OnExamination - Cardiology

A 55-year-old male presents with dysphagia, retrosternal discomfort and weight loss. Studies reveal achalasia.

Which of the following is most likely to provide symptomatic relief?

- 1- Buscopan
- 2- Diazepam
- 3- Omeprazole
- 4- Nifedipine
- 5- Surgical cardiomyotomy

Answer & Comments

Answer: 5- Surgical cardiomyotomy

75% cure may be expected by cardiomyotomy in Achalasia. Nitrates and hydralazine can help in the short term. None of other choices help the symptoms.

Oesophageal dilatation is usually attempted before laparoscopic surgical myotomy.



[Q: 94] OnExamination - Cardiology

A 60-year-old man has a three month history of worsening dyspnoea. He has been healthy all his life with no major illnesses. His blood pressure is 118/92 mmHg, he has a murmur and has audible crackles at both bases. His serum glucose is 5.6 mmol/L. His total serum cholesterol is 4.8 mmol/L. The serum creatine kinase is not elevated.

The most likely explanation for these findings is?

- 1- Alcoholic cardiomyopathy
- 2- Aortic dissection
- 3- Calcified bicuspid aortic valve
- 4- Mitral valve annulus calcification
- 5- Tricuspid valve endocarditis

Answer & Comments

Answer: 3- Calcified bicuspid aortic valve

The clinical signs point to a left-sided heart failure which would discount alcoholic cardiomyopathy as it would be biventricular and tricuspid valve endocarditis which would be right sided. There are no acute symptoms and the history is not sudden to suggest aortic dissection. Mitral valve calcification is an incidental finding at ECHO. This leaves a calcified bicuspid aortic valve leading to aortic stenosis as the likely explanation.



[Q: 95] OnExamination - Cardiology

A 45-year-old male type 1 diabetic with a number of complex diabetic gastrointestinal complications is noted to have a PR interval of 0.18s, a QRS duration of 0.1s and a QT interval of 0.48s on routine ECG.

Which of the following drugs may be responsible?

- 1- Co-trimoxazole
- 2- Cimetidine
- 3- Domperidone

4- Erythromycin

5- Octreotide

Answer & Comments

Answer: 4- Erythromycin

Erythromycin has been associated with prolonged QT interval and torsades de pointe and is used in diabetic gastropathy although its benefits in the condition are not entirely understood. Prolonged QT is defined as greater than 0.45s. Other agents include amitriptyline and phenothiazines yet metoclopramide and domperidone are not associated.



[Q: 96] OnExamination - Cardiology

A 44-year-old man has had no major medical problems throughout his life, except for arthritis pain involving all extremities for the past couple of years. He has had worsening orthopnoea and ankle oedema in the past six months. He is afebrile. There is no chest pain. A chest X-ray shows cardiomegaly with both enlarged left and right heart borders, along with pulmonary oedema. Laboratory test findings include sodium 139 mmol/L, potassium 4.3 mmol/L, urea 7 mmol/L creatinine 95 µmol/L, and glucose 8.6 mmol/L.

Which of the following additional laboratory test findings is he most likely to have?

- 1- Anti-centromere antibody titer of 1:320
- 2- Erythrocyte sedimentation rate of 79 mm/Hr
- 3- Haemoglobin of 10.7 g/dL with MCV of 72 fL
- 4- Serum ferritin of 3400 pmol/L
- 5- Spherocytes in his peripheral blood smear

Answer & Comments

Answer: 4- Serum ferritin of 3400 pmol/L

He has findings of a cardiomyopathy with right and left heart failure. Hereditary haemochromatosis (HHC) is suspected with a serum ferritin > 1000 and confirmed by genetic testing.

Hereditary haemochromatosis is characterised by diabetes, CCF, pseudogout and slate-grey skin.

"HHC is an autosomal recessive condition and in 90% of cases in the United Kingdom (UK) the condition is owing to homozygosity for the C282Y mutation in the HFE gene. A second mutation in the HFE gene, H63D, can cause the disease when in the presence of a single C282Y mutation (the so-called 'compound heterozygote' state). These mutations are common in people of Northern European origin with a carrier frequency of the C282Y mutation of one in 10-17, in the UK, suggesting a prevalence of people homozygous for the C282Y mutation of between one in 100 and one in 280. If HHC becomes symptomatic by mid-life, a general practitioner (GP) with a list size of 2000 patients should have approximately four cases. In our experience most GPs claim to have never seen a case. Herein lies the conundrum: is HHC far more common than is currently recorded in clinical records and death registers because it is not being diagnosed, or does significant disease not develop in a large proportion of C282Y homozygotes and compound heterozygotes



[Q: 97] OnExamination - Cardiology

A 51-year-old woman has had several syncopal episodes over the past year. Each episode is characterized by sudden but brief loss of consciousness. She has no chest pain. She has no ankle edema. On brain MRI there is a 1.5 cm cystic area in the left parietal cortex. A chest X-ray shows no cardiac enlargement, and her lung fields are normal. Her serum total cholesterol is 6.5 mmol/L.

Which of the following cardiac lesions is she most likely to have?

- 1- Cardiac amyloidosis
- 2- Ischemic cardiomyopathy
- 3- Left atrial myxoma
- 4- Mitral valve prolapse
- 5- Tuberculous pericarditis

Answer & Comments

Answer: 3- Left atrial myxoma

Atrial myxomas are more often on the left. Though benign, they can occlude the mitral valve and produce sudden loss of cardiac output. They may embolize small portions of themselves or thrombus formed over their surface.



[Q: 98] OnExamination - Cardiology

A 17-year-old boy whose brother had hypertrophic cardiomyopathy was referred for a cardiological assessment. His echocardiogram confirmed the condition.

Which one of the following echocardiographic features is the most important risk factor for sudden cardiac death?

- 1- A gradient of 10 mmHg across the left ventricular outflow tract
- 2- Significant thickening of the intraventricular septum
- 3- An enlarged left atrium
- 4- Systolic anterior motion of the mitral valve
- 5- The presence of mitral regurgitation

Answer & Comments

Answer: 2- Significant thickening of the intraventricular septum

Patients die of hypertrophic obstructive cardiomyopathy by obstructing the left ventricular outflow tract (LVOT), usually during exercise. The greater the thickness of

the septum, the more likely it is to obstruct the LVOT.



[Q: 99] OnExamination - Cardiology

Which of the following concerning the use of intravenous bicarbonate in cardiorespiratory arrest is correct?

- 1- exacerbates intracellular acidosis
- 2- has a positive inotropic effect on ischaemic myocardium
- 3- improves oxygen release to the tissues
- 4- increases cerebral blood flow
- 5- reduces pre-existent hyperkalemia

Answer & Comments

Answer: 1- exacerbates intracellular acidosis

Bicarbonate therapy can increase extracellular pH only if the CO₂ produced can be removed by adequate ventilation. Indeed if hypercapnia occurs then as CO₂ crosses cell membranes easily, intracellular pH may decrease even further with further deterioration of cellular function. Has negative inotropic effect, reducing cerebral blood flow, shifts oxygen dissociation curve to the left inhibiting oxygen release to tissues.



[Q: 100] OnExamination - Cardiology

A 72-year-old man presented following three episodes of transient loss of consciousness not associated with chest pain. There was a previous history of an anterior myocardial infarction. On examination his blood pressure was 140/80 mmHg and the apex beat was diffuse in character and displaced to the left. There were no neurological signs.

The ECG showed sinus rhythm with occasional ventricular extrasystoles, deep anterior Q waves and ST segment elevation in leads V2 - V6, without reciprocal depression.

Which one of the following would be the most appropriate initial course of action?

- 1- Administer tissue plasminogen activator
- 2- Arrange an electroencephalogram
- 3- Arrange immediate CT brain scan
- 4- Observe in the coronary care unit
- 5- Proceed to coronary arteriography

Answer & Comments

Answer: 4- Observe in the coronary care unit

This gentleman has persistent ST elevation, in the anterior leads, with a previous history of anterior myocardial infarction which suggests LV aneurysm. The loss of consciousness is likely to be due to recurrent arrhythmic episodes or vertebrobasilar TIAs, as a result of embolization of an LV thrombus. The most important investigation for this patient who you suspect has arrhythmic episodes would be telemetry/24 hr monitoring and hence observation on CCU is appropriate.



[Q: 101] OnExamination - Cardiology

A 68-year-old woman was admitted to hospital with severe acute dyspnoea. She denied having any chest pain but said that she had become progressively breathless over the past three months.

On examination her pulse was 120 beats per minute and regular. Her blood pressure was 95/55 mmHg and her jugular venous pressure was elevated to the angle of the jaw. Her heart sounds were normal. Auscultation of her chest revealed bilateral fine inspiratory crackles to the mid zones. She had haemorrhages in both fundi.

Investigations revealed:

Haemoglobin 5.6 g/dL (NR 11.5 - 16.5)
 Haematocrit 0.19 (NR 0.36 - 0.47)
 MCV 118 fL (NR 80 - 96)

MCH 33.0 pg (NR 28 - 32)

White cell count $3.4 \times 10^9/L$ (NR 4 - 11)

Platelets $95 \times 10^9/L$ (NR 150 - 400)

Serum Vitamin B₁₂ Result pending

Serum folate Result pending

The ECG showed left bundle branch block, which had been documented previously

She is given 80mg of intravenous furosemide which results in an excellent diuresis

What is the next most appropriate immediate step in her management?

- 1- Blood transfusion
- 2- Bone marrow aspiration
- 3- Start intramuscular Vitamin B₁₂ and oral folic acid
- 4- Start oral ferrous sulphate
- 5- Thrombolyse with t-PA

Answer & Comments

Answer: 1- Blood transfusion

The clinical picture represents severe megaloblastic anaemia with cardiac failure.

The questions asks about immediate management. Although the anaemia has been developing slowly, she has become acutely haemodynamically compromised. In such circumstances it would be most appropriate to transfuse the patient. This would need to be done very cautiously with diuretic cover.

She will clearly need to start an intensive course of intramuscular vitamin B₁₂ and oral folic acid as well, but this is less important in the hyperacute situation where there is a risk of the patient dying from anaemia.

Giving oral folic acid without vitamin B₁₂ would be hazardous and could precipitate subacute combined degeneration of the spinal cord. Transfusion may also be hazardous in a patient with severe CCF



[Q: 102] OnExamination -
Cardiology

A 57-year-old male is admitted with acute dyspnoea and chest pain. A PE is confirmed.

Which of the following is a recognised feature of a significant pulmonary embolism?

- 1- reduced plasma lactate levels
- 2- an increase in serum troponin levels
- 3- an arterial pH less than 7.2
- 4- blood gases show increased pCO₂ on air
- 5- normal D-dimer levels

Answer & Comments

Answer: 2- an increase in serum troponin levels

Cardiac troponins are reliable markers of myocardial injury that are being used increasingly in patients presenting with undifferentiated chest pain or dyspnea to diagnose an acute coronary syndrome. If elevated cardiac troponin levels also occur in patients with pulmonary embolism because of right ventricular dilation and myocardial injury, such patients could be misdiagnosed. We performed a prospective cohort study to determine the prevalence of elevated cardiac troponin I (cTnI) levels in patients with submassive pulmonary embolism. METHODS: Consecutive patients with objectively confirmed submassive pulmonary embolism and no previous history of ischemic heart disease, other cardiac disease, or renal insufficiency were included. Creatine kinase and cTnI levels were measured within 24 hours of clinical presentation on 2 occasions 8 to 12 hours apart. RESULTS: Of 24 patients with submassive pulmonary embolism, 5 (20.8%) had elevated cTnI levels of 0.4 microg/L or higher (95% confidence interval, 7.1-42.2%). One of these patients had a cTnI level higher than 2.3 microg/L that was suggestive of myocardial infarction. CONCLUSION: Pulmonary embolism should be

considered in the differential diagnosis of patients presenting with undifferentiated chest pain or dyspnea and an elevated cardiac troponin level. (Arch Intern Med, 162(1): 79-81 2002)

Hypoxemia and hypocapnoea are common after major pulmonary embolism and may also be found after more minor events. Absence of these phenomena, on the other hand, by no means excludes embolism and their presence is non-specific. In suspected minor embolism this investigation is, at best, only of marginal value. The precise stimulus to hyperventilation is unknown and there is also difficulty in understanding the reasons for hypoxaemia when it is present.



[Q: 103] OnExamination -
Cardiology

A 14-year-old boy presents with fever.

Which of the following might contribute to a diagnosis of rheumatic fever?

- 1- The finding of target lesions on the hands.
- 2- The finding of tender nodules in the fingertips.
- 3- A prolonged PR interval on ECG.
- 4- A CRP of 10.
- 5- Positive Romberg's sign.

Answer & Comments

Answer: 3- A prolonged PR interval on ECG.

The modified Jones Criteria include: Finding of preceeding streptococcal infection (recent scarlett fever, raised ASOT or other streptococcal antibodies, positive throat swab for Group A Strep). Plus:

a) MAJOR CRITERIA:

- o Carditis
- o Polyarthritis
- o Chorea

- o Subcutaneous nodules
- o Erythema marginatum.

b) MINOR CRITERIA:

- o Fever
- o Arthralgia
- o Previous history of rheumatic fever
- o Elevated acute phase reactions
- o Prolonged PR interval.

Erythema marginatum involves red circular lesions which gradually enlarge with central clearing. Sydenham's chorea consists of choreoathetoid movements with increased clumsiness, e.g. deteriorating handwriting. This is often associated with emotional lability. Target lesions suggest erythema multiforme. A CRP of 10 is not elevated much beyond the normal range. Erythema marginatum initially manifests as non-specific pink macules seen over the trunk, with later blanching in the middle of the lesions and sometimes fusing of the borders resulting in a serpiginous (serpent-like) looking lesion. The rash is worsened with heat, but is characteristically evanescent. It does not itch, and can be mistaken for the rash of Lyme disease. Sub-cutaneous nodules are pea-sized, firm and non-tender. There is no associated inflammation and they are characteristically seen on the extensor surfaces of joints such as knees and elbows and also over the spine.



[Q: 104] OnExamination - Cardiology

A 66-year-old insulin dependent diabetic given ibuprofen for a knee injury is admitted with palpitations. His electrocardiogram shows a rate of 105 beats per min, with absent P waves and tall T waves. His Urea and Electrolytes show:

Sodium	132 mmol/l	(133-144)
Potassium	6.4 mmol/l	(3.5-5)

Urea	11 mmol/l	(3-8)
------	-----------	-------

Creatinine	180 micromol/l	(50-100)
------------	----------------	----------

In this scenario, which of the following is the most appropriate immediate management?

- 1- Calcium Chloride 10mmol IV
- 2- Calcium Resonium orally
- 3- Dextrose 50mls 50% with 10 units insulin
- 4- Dialysis
- 5- Furosemide 1mg/kg IV

Answer & Comments

Answer: 1- Calcium Chloride 10mmol IV

The ECG suggests cardiotoxicity related to hyperkalaemia and the history of palpitations is suggestive of arrhythmias. Therefore cardio protection with Calcium Chloride or gluconate should be first priority and lowering potassium levels immediately thereafter.



[Q: 105] OnExamination - Cardiology

A 16-year-old boy is admitted after a blackout at the dentist. His mother describes how he blacked out as the dentists began performing a filling and that he jerked his arms a few times and was then incontinent. He awoke after a minute or so and was oriented but nauseous. There were no similar episodes in the past and he is totally unaware of what happened.

Examination was normal and his ECG was normal.

Which one of the following is the most likely diagnosis?

- 1- Complex partial seizure
- 2- Pseudoseizure
- 3- Stokes-Adams attack
- 4- Tonic-clonic seizure
- 5- Vasovagal syncope

Answer & Comments

Answer: 5- Vasovagal syncope

Vasovagal syncope is common during dental procedures, mainly induced by pain (as the dentist started drilling). The fact that he recovered very quickly supports the diagnosis of syncope. It is common to have jerking of limbs due to brain hypoxia. ECG is always normal. Incontinence of urine can occur but not biting of the tongue.



[Q: 106] OnExamination -
Cardiology

A 58-year-old male presents with acute dyspnoea following a convulsion. On examination his blood pressure was 240/120 mmHg and fundal examination reveals pailloedema with haemorrhages and cotton wool spots. His urea, electrolytes and creatinine are normal but chest X-ray reveals pulmonary oedema and cardiomegaly.

Which one of the following is the most appropriate immediate treatment?

- 1- atenolol 50 mg orally
- 2- intravenous labetalol
- 3- intravenous sodium nitroprusside
- 4- nifedipine 5 mg sublingually
- 5- nifedipine LA 30 mg orally

Answer & Comments

Answer: 3- intravenous sodium nitroprusside

This patient has malignant hypertension with papilloedema, convulsions and pulmonary oedema (thus excluding the use of a β -blocker in the acute setting). This constitutes a medical emergency with Nitroprusside being the treatment of choice.



[Q: 107] OnExamination -
Cardiology

A 59-year-old man is admitted with chest pain

of 8 hours duration and has ST elevation in the inferior leads on his admission ECG. An electrocardiogram from a previous clinic visit shows sinus rhythm two months ago. He has insulin dependent diabetes mellitus and chronic renal failure.

Investigations reveal:

Fasting plasma glucose 7.4 mmol/l (3.5-6)

Sodium 137 mmol/l (134-144)

Potassium 4.4 mmol/l (3.5-5)>

Urea 10 mmol/l (3-8)

Creatinine 200 micromol/l (50-100)

Which of the following which represent an absolute contraindication to the use of thrombolysis?

- 1- Allergy to penicillin.
- 2- Gastro intestinal bleeding in last 3 months.
- 3- History of haemorrhagic stroke.
- 4- Ischaemic stroke 12 months ago
- 5- On warfarin therapy

Answer & Comments

Answer: 3- History of haemorrhagic stroke.

Absolute contraindications to thrombolysis include:

Previous haemorrhagic stroke

Ischaemic stroke in last 6 months

Central nervous system damage or neoplasm

Within 3 weeks of major surgery, head injury or major trauma

Active internal bleeding (menses excluded) or gastro-intestinal bleeding within the past month.

Known or suspected aortic dissection

Known bleeding disorder

Proliferative diabetic retinopathy

Allergy and oral anticoagulants are relative contraindications.



[Q: 108] OnExamination -
Cardiology

Which one of the following is the most likely mechanism by which Aspirin exerts its beneficial effects in patients with coronary artery disease?

- 1- anti-inflammatory action
- 2- cyclo-oxygenase inhibition
- 3- glycoprotein IIB/IIIA receptor inhibition
- 4- inhibition of binding of adenosine diphosphate to its platelet receptor
- 5- structural changes in platelets

Answer & Comments

Answer: 2- cyclo-oxygenase inhibition

It inhibits platelet aggregation through inhibition on both COX I and II. Clopidogrel inhibits ADP binding to platelet receptors.



[Q: 109] OnExamination -
Cardiology

A 65-year-old male attends clinic complaining of breathlessness. He has endstage cardiac failure due to dilated cardiomyopathy. Currently he takes Furosemide, Lisinopril and Cardvedilol.

Which one of the following drugs should be added to his current therapy?

- 1- Diltiazem
- 2- Digoxin
- 3- Isosorbide Mononitrate
- 4- Nicorandil
- 5- Vitamin C

Answer & Comments

Answer: 2- Digoxin

Digoxin has a positive inotropic effect, it can be used in patients with heart failure who are in sinus rhythm but remain symptomatic despite therapy with an ACE inhibitor diuretic and beta blocker.



[Q: 110] OnExamination -
Cardiology

A 52-year-old male presents with a 3 week history of fevers, deteriorating breathlessness and fatigue. Two years ago he underwent prosthetic valve replacement for a calcified bicuspid aortic valve. On examination he has a temperature of 37.7°C and four nailfold infarcts. Vegetations are demonstrated through trans-oesophageal echocardiography.

Which of the following is the most likely causative organism?

- 1- Candida spp.
- 2- Enterococcus
- 3- Staphylococcus aureus
- 4- Staphylococcus epidermidis
- 5- Streptococcus viridans

Answer & Comments

Answer: 5- Streptococcus viridans

Generally there are two identifiable modes of prosthetic valve endocarditis. The first occurs within the first year after surgery affecting 0.7-3% of cases and is often due to staphylococci. Late endocarditis observed after two years post surgery is found in 0.5-1% of cases and is typically due to streptococci - typically group A haemolytic otherwise known as strep viridans.



[Q: 111] OnExamination -
Cardiology

A 35-year-old woman presented with a history of intermittent light-headedness. Clinical examination and 12-lead ECG were normal.

Which of the following, if present on a 24 hour Holter ECG tracing, would be the most clinically important?

- 1- Atrial premature beats.
- 2- Profound sleep-associated bradycardia.
- 3- Supraventricular tachycardia.
- 4- Transient Mobitz type 1 atrioventricular block.
- 5- Ventricular premature beats.

Answer & Comments

Answer: 3- Supraventricular tachycardia.

SVT commonly presents with palpitations but occasionally is associated with light-headedness. I really struggled with this question. I think it is what examiners refer to as a discriminatory question or basically one with no right answer. The problem is that intuitively SVT is the most common arrhythmia in this age group and can be associated with light-headedness but as you know significant SVT commonly presents with palpitations; however, There is no mention of palpitations. The word "profound", preceding sleep-associated bradycardia is confusing; are they alluding to the fact that this woman has sick sinus and significant bradycardia has only manifested itself in her sleep? Is this more than just normal sleep associated bradycardia? I don't think that is the right answer though. Then there is D, Wenkebach is almost always asymptomatic but what is a 35-year-old doing with Mobitz type I (it is commonly seen in athletes - Dean Jenkins)? We had a straw poll here at cardiology and decided in the end the right answer is C, which I agree with.



[Q: 112] OnExamination - Cardiology

A 65-year-old African man with a known history of hypertension presents with ankle oedema after taking an antihypertensive

prescribed by his General Practitioner. He is now found to have a Blood Pressure of 160/100 mmHg.

Which of the following would be the preferred drug for this patient?

- 1- Amlodipine
- 2- Atenolol
- 3- Bendroflumethiazide
- 4- Ramipril
- 5- Verapamil

Answer & Comments

Answer: 3- Bendroflumethiazide

The patient has ankle oedema which is usually due to vasodilatation by calcium channel blockers. The preferred initial antihypertensive therapy for the elderly African patient will be bendroflumethiazide according to BHS guideline, 2004. ACE inhibitors are preferred for those patients with heart failure or Diabetic nephropathy. β -Blockers are preferred for post-myocardial infarction and ischemic heart disease.



[Q: 113] OnExamination - Cardiology

A 30-year-old man presents with a history of transient loss of consciousness and palpitations. His ECG shows ventricular tachycardia.

Which of the following treatments should be avoided?

- 1- adenosine
- 2- amiodarone
- 3- DC cardioversion
- 4- flecainide
- 5- verapamil

Answer & Comments

Answer: 5- verapamil

If there were 'killer' questions (questions that if a candidate got wrong they would certainly fail the exam) in the MRCP exam then this would be one of them. Verapamil should be avoided in cases of VT because it can cause a catastrophic fall in blood pressure. Adenosine is useful diagnostically when the diagnosis of regular wide complex tachycardia is in doubt. Amiodarone is a useful antiarrhythmic agent though its use acutely is limited by its irritant nature on veins. DC Cardioversion is probably the treatment of choice in this case. Flecainide is a good antiarrhythmic and would be indicated in patients without LV failure (it is associated with an increased risk of death in such cases). Flecainide is widely used for atrial fibrillation.



[Q: 114] OnExamination - Cardiology

A 45-year-old female presents with a two day history of fever and joint pains. She has a past history of hypertension for which she is receiving anti-hypertensives. On examination she has a temperature of 38°C, a facial rash and slight swelling with tenderness of the wrist and ankle joints.

Which of the following anti-hypertensives is most likely to be responsible for her presentation?

- 1- Alpha-methyldopa
- 2- Bendroflumethiazide
- 3- Hydralazine
- 4- Minoxidil
- 5- Phenoxybenzamine

Answer & Comments

Answer: 3- Hydralazine

The presence of fever, facial rash and arthralgia suggest a diagnosis of drug-induced SLE, with hydralazine being a well recognised cause. Gout may be precipitated by bendroflumethiazide and it also causes a

photosensitivity rash but the two diagnoses together with a fever would be remote.



[Q: 115] OnExamination - Cardiology

A 34-year-old male presents with episodes of breathlessness on exertion. Examination reveals a loud P2 and fixed splitting of the second sound.

Which of the following may be responsible for these signs?

- 1- Excess maternal alcohol consumption
- 2- Homocystinuria
- 3- 47 XXY karyotype
- 4- Maternal chicken pox infection
- 5- Maternal thalidomide therapy

Answer & Comments

Answer: 1- Excess maternal alcohol consumption

Fetal alcohol syndrome, Down's syndrome and Congenital rubella syndrome are associated with an ASD as described in this case with a loud second sound plus fixed splitting.



[Q: 116] OnExamination - Cardiology

A 70-year-old man is admitted with an acute Q-wave inferior Myocardial Infarction. On day 5, he suddenly develops pulmonary oedema and a loud systolic murmur.

Which of the following would be the most useful in establishing a diagnosis?

- 1- chest X-ray
- 2- coronary arteriography
- 3- ECG
- 4- right heart catheterisation and oximetry
- 5- serum cardiac enzymes

Answer & Comments

Answer: 4- right heart catheterisation and oximetry

This patient has developed acute LVF 5 days after an inferior MI. Things to think about include MV prolapse, VSD or acute pericardial effusion/haemorrhage. Right heart studies would provide information on LA pressures and suggestive information on the most likely diagnosis - MV prolapse.



[Q: 117] OnExamination - Cardiology

A 40-year-old male attends for a consultation after discovering that his brother has been diagnosed with a familial hypertrophic obstructive cardiomyopathy.

Which screening method should he be offered?

- 1- Coronary Angiograms
- 2- Exercise ECG
- 3- Genetic testing
- 4- Transthoracic Echocardiogram
- 5- Transoesophageal Echocardiogram

Answer & Comments

Answer: 4- Transthoracic Echocardiogram

Current guidelines suggest that a resting ECG and TTE (transthoracic ECHO) are the most effective screening strategy for relatives of patients with HOCM. Genetic testing is not recommended as a first line screening tool given varying rates of penetrance.



[Q: 118] OnExamination - Cardiology

A 58 year-old male is admitted with a blood pressure of 210/120 and episodic runs of ventricular tachycardia. Investigations confirm the presence of a right adrenal pheochromocytoma.

Which one of the following would be the most appropriate initial therapy?

- 1- Amiodarone
- 2- Atenolol
- 3- Lidocaine
- 4- Phenoxybenzamine
- 5- Propofenone

Answer & Comments

Answer: 4- Phenoxybenzamine

This patient has catecholamine-induced severe hypertension and associated paroxysmal ventricular tachycardia. The patient should initially be alpha-blocked with phenoxybenzamine and then β -blockers introduced. This should control the runs of VT but for sustained VT lidocaine can be acutely used.



[Q: 119] OnExamination - Cardiology

Which of the following statements are true of coronary artery anatomy?

- 1- Right bundle branch block in acute anterior myocardial infarction suggests obstruction prior to the first septal branch of the left anterior descending coronary artery
- 2- the posterior descending artery is usually a branch of the circumflex artery
- 3- The sinus node is supplied by a branch of the right coronary in over 90% of subjects.
- 4- The AV node is supplied by the left anterior descending coronary artery.
- 5- The left main stem is about 4 cm long

Answer & Comments

Answer: 1- Right bundle branch block in acute anterior myocardial infarction suggests obstruction prior to the first septal branch of the left anterior descending coronary artery

It is sometimes said that questions longer than 2 lines are usually false ... but not in this case.

The posterior descending artery is most often (85%) a branch of the right coronary artery. The sinus node artery is a branch of the right coronary artery in 60% of cases. The AV node is supplied from the posterior descending coronary artery. The left main stem is much shorter than 4 cm!



[Q: 120] OnExamination - Cardiology

Left axis deviation is seen on the ECG in which of the following conditions?

- 1- atrioventricular canal defects.
- 2- Ebstein's anomaly.
- 3- large ventricular septal defect.
- 4- patent ductus arteriosus.
- 5- tetralogy of Fallot.

Answer & Comments

Answer: 1- atrioventricular canal defects.

Left axis deviation is also seen in tricuspid atresia.



[Q: 121] OnExamination - Cardiology

A 72-year-old man is admitted with fast atrial fibrillation but is receiving treatment with digoxin. An inadequate dose is suspected. A sample of blood is drawn six hours after the last dose of digoxin and a plasma concentration is requested.

Which of the following factors explains the six hour wait before measuring the digoxin concentration?

- 1- enterohepatic circulation
- 2- the rate of absorption
- 3- the rate of clearance
- 4- the rate of distribution

- 5- the rate of elimination

Answer & Comments

Answer: 4- the rate of distribution

A blood sample needs to be drawn at least six hours after administration of digoxin to ensure adequate distribution.



[Q: 122] OnExamination - Cardiology

A 26-year-old man is noted to have cyanosis of the lower limbs and clubbing of the toes but not the fingers.

Which of the following statements is true?

- 1- He has Eisenmenger's syndrome.
- 2- He has coarctation of the aorta.
- 3- He is likely to have a loud continuous 'machinery' murmur below the left clavicle.
- 4- He is likely to need urgent surgery.
- 5- He has had a Blalock shunt operation.

Answer & Comments

Answer: 1- He has Eisenmenger's syndrome.

This is the differential cyanosis of a reversed patent ductus arteriosus (PDA). There is a right-left shunt from the pulmonary artery to the aorta just distal to the left subclavian artery.

Coarctation causes radiofemoral delay. It may be associated with PDA but there is no suggestion in this patient.

Continuous machinery murmur is the classic murmur of PDA but when the shunt reverses (as in patients with a large PDA and/or pulmonary disease) the murmur becomes softer and shorter.

When Eisenmenger's syndrome has developed surgery is associated with a very high mortality.

A Blalock shunt (anastomosis of subclavian artery to pulmonary artery) used to be performed for Fallot's tetralogy and leads to a weak left radial pulse.



[Q: 123] OnExamination - Cardiology

A publication reports the outcome of a new statin therapy in a placebo controlled primary prevention of ischaemic heart disease in a diabetic population. 1000 patients were randomised to receive the new therapy and 1000 allocated to placebo. The study was completed over a five year period. In the placebo group there were 150 myocardial infarcts and in the group treated with the new statin there were 100 myocardial infarcts.

What is the number needed to treat to prevent one MI over the course of this study?

- 1- 10
- 2- 20
- 3- 30
- 4- 40
- 5- 50

Answer & Comments

Answer: 2- 20

You treat 1000 patients for 5 years with the new statin and prevent 50 MIs. Thus the Number Needed to Treat (NNT) to prevent 1 MI is 20 (1000/50). Again, this statistical figure provides us with a lot of information regarding the efficacy of a treatment rather than purely statistically significant data. As it stands, you may expect to prevent an infarct by treating as few as 20 patients over 5 years from this data. Furthermore, cost economic data can be calculated from such results by factoring in how much the drug costs against all the costs of treating and rehabilitating a patient with an MI.



[Q: 124] OnExamination - Cardiology

A publication reports the outcome of a new statin therapy in a placebo controlled primary prevention of ischaemic heart disease in a diabetic population. 1000 patients were randomised to receive the new therapy and 1000 allocated to placebo. The study was completed over a five year period. In the placebo group there were 150 Myocardial infarcts and in the group treated with the new statin there were 100 infarcts.

What is the relative risk reduction of MI afforded by statin therapy?

- 1- 15%
- 2- 25%
- 3- 33%
- 4- 40%
- 5- 50%

Answer & Comments

Answer: 3- 33%

There are 50 fewer MIs in the treated group than the placebo treated group, hence $50/150=33\%$. The relative risk reduction provides information regarding the efficacy of a therapy and what reduction in risk may be expected when treating subjects rather than just having data relating to the significance of the data.



[Q: 125] OnExamination - Cardiology

A 62-year-old man has experienced substernal chest pain upon exertion with increasing frequency over the past 1 year. An electrocardiogram shows T wave inversion in the anterolateral leads at rest. He has a total serum cholesterol of 7.0 mmol/l. On angiography, he has an 85% narrowing of the left anterior descending artery.

Which of the following events is most likely to occur in this patient?

- 1- A systemic artery embolus from thrombosis in a peripheral vein.
- 2- A systemic artery embolus from a left atrial mural thrombus.
- 3- Pulmonary embolism from a left ventricular mural thrombus
- 4- A systemic artery embolus from a left ventricular mural thrombus.
- 5- Pulmonary embolism from thrombosis in a peripheral vein.

Answer & Comments

Answer: 4- A systemic artery embolus from a left ventricular mural thrombus.

The suggestion here is that this man has coronary artery disease with an impending myocardial infarction. Infarction of the LAD would cause necrosis of the left ventricle. Thrombus may form on an area of dyskinetic ventricle. Therefore he is most at risk of embolus of thrombus from the LV.



[Q: 126] OnExamination - Cardiology

In a trial of a new drug the following results were obtained:

	improved	not improved
treatment group	44	16
placebo group	36	26

Which of the following statements regarding the statistical analysis or interpretation of the trial is true?

- 1- A Student t-test could be used.
- 2- Pearson's coefficient of linear regression would be an appropriate significance test.
- 3- The data could be evaluated using the Chi-squared test.
- 4- The numbers are too small to draw any conclusions.

- 5- The results so obviously show the benefit of treatment that statistical analysis is not required.

Answer & Comments

Answer: 3- The data could be evaluated using the Chi-squared test.

This data would be ideal for a Chi-squared test. It is a 2 x 2 contingency table for which there is a special Chi-squared formula that gives a value that can be looked up in a table giving the p value.

Nothing is ever so obvious that no statistical analysis is needed surely? Pearson's coefficient cannot be calculated as there is no linear regression to plot. The Student t-test cannot be used as we are comparing proportions not means.



[Q: 127] OnExamination - Cardiology

With regard to cardiac troponins, which ONE of the following statements is correct?

- 1- Elevated plasma troponin concentrations are specific markers of ischaemic heart disease
- 2- Plasma troponin concentrations are typically elevated three weeks after an acute myocardial infarction
- 3- Plasma troponin concentrations are typically reduced in subjects with atrial fibrillation
- 4- The specificity of troponins for myocardial injury is similar to that of creatine kinase-MB
- 5- The clinical role of troponins is to rule out acute myocardial infarction in patients presenting with chest pain

Answer & Comments

Answer: 5- The clinical role of troponins is to rule out acute myocardial infarction in patients presenting with chest pain

Elevated troponin concentrations are highly specific for cardiac injury/infarction and are usually normal in patients with ischaemic heart disease/angina but may also be elevated in patients with pulmonary embolism or renal failure (reduced excretion). Concentrations typically peak 12-24 hrs after myocardial injury and remain elevated for 7-14 days. Studies reveal that raised troponins are far more specific than CK-MB.



[Q: 128] OnExamination - Cardiology

A 64-year-old man is admitted with a right femoral neck fracture following a fall. Also seen in the radiograph of the pelvis are several prominent calcified vessels.

What is the most appropriate next step in management of this finding?

- 1- Anticoagulate with heparin
- 2- Ignore it
- 3- Order a pulmonary ventilation-perfusion scan
- 4- Request a serum troponin test
- 5- Start the patient on a nitrate infusion

Answer & Comments

Answer: 2- Ignore it

This finding is typical for Monckeberg's calcific medial sclerosis, a benign condition involving muscular arteries of older persons.



[Q: 129] OnExamination - Cardiology

Whilst attending the cardiology clinic, the staff nurse measures the blood pressure of a 61-year-old man, and finds that it is 183/100

mmHg sitting and 190/105 standing. He has a heart rate of 81/minute, with an irregularly irregular rhythm. On auscultation of the heart, there are no murmurs, but he has bibasilar crackles on chest examination.

Which of the following pathological findings is most likely to be present?

- 1- Left ventricular hypertrophy
- 2- Left atrial myxoma
- 3- Occlusive coronary atherosclerosis
- 4- Cor pulmonale
- 5- Mitral regurgitation

Answer & Comments

Answer: 1- Left ventricular hypertrophy

This gentleman is likely to have a hypertensive cardiomyopathy with a left ventricle hypertrophy. The LVH is secondary to increased afterload, as a result of chronic hypertension. The AF, suggested by an irregularly irregular pulse is an indicator of diastolic dysfunction and poor ventricular filling. This in turn the pulmonary congestion, as evidenced by the bibasal crackles. There is no murmur or plop to suggest atrial myxoma.



[Q: 130] OnExamination - Cardiology

Which of the following lipid abnormalities are most likely to be detected in a diabetic patient?

- 1- Elevated HDL concentrations
- 2- Elevated LDL concentrations
- 3- Large buoyant LDL molecules
- 4- Reduced triglycerides concentrations
- 5- Small dense LDL molecules

Answer & Comments

Answer: 5- Small dense LDL molecules

In type 2 diabetes increased CETP activity results in the transfer of triglycerides from VLDL to HDL and LDL. This results in small dense LDL which is more atherogenic being able to be oxidised more readily and penetrate endothelium and macrophages. LDL is not typically elevated in type 2 diabetes, although there are qualitative changes as indicated above. HDL is typically low in the type 2 diabetic patient.



[Q: 131] OnExamination - Cardiology

A 72-year-old man noted to have a systolic murmur undergoes an echocardiogram which demonstrates aortic stenosis.

Which of the following is associated with a poor prognosis in this patient?

- 1- Aortic regurgitation
- 2- Cardiomegaly on chest X-ray
- 3- Clinical features of left ventricular failure
- 4- ECG evidence of left ventricular hypertrophy
- 5- severe valvular calcification on echocardiogram

Answer & Comments

Answer: 3- Clinical features of left ventricular failure

Aortic stenosis is associated with a worse prognosis when accompanied by left ventricular dysfunction. Other predictors of a poorer prognosis include increasing gradient across the valve (above 70 mmHg), age of patient and symptomatology. Although the severity of valvular calcification is prognostically important in an asymptomatic patient the most important predictor is LV function.



[Q: 132] OnExamination - Cardiology

A 68 year-old woman with atrial fibrillation is admitted for DC cardioversion. The procedure resulted in successful restoration of sinus rhythm.

Which one of the following drugs would be most likely to maintain sinus rhythm following this procedure?

- 1- amiodarone
- 2- digoxin
- 3- diltiazem
- 4- sotalol
- 5- verapamil

Answer & Comments

Answer: 1- amiodarone

Amiodarone has been shown to be superior in maintaining sinus rhythm following "DC cardioversion" of AF. However, it is associated with more toxic side effects than the other agents mentioned. Neither verapamil, diltiazem nor digoxin would be expected to maintain sinus rhythm to any significant extent. Sotalol may be considered as a possible therapy but is less effective than amiodarone.



[Q: 133] OnExamination - Cardiology

A 25-year-old previously healthy woman has worsening fatigue with dyspnoea, palpitations, and fever over the past one week. Her vital signs on admission to the hospital show Temperature 38.9°C Respiratory rate 30/min Pulse 105 bpm and BP 95/65 mmHg. Her heart rate is irregular. An ECG shows diffuse ST-T segment changes. A Chest X-ray shows mild cardiomegaly. An echocardiogram shows slight mitral and tricuspid regurgitation but no valvular vegetations. Her troponin I is 12 ng/mL

(NR<0.04). She recovers over the next two weeks with no apparent sequelae.

Which of the following laboratory test findings best explains the underlying etiology for these events?

- 1- ANCA titer of 1:80
- 2- Anti-streptolysin O titer of 1:512
- 3- Blood culture positive for Streptococcus, viridans group
- 4- Coxsackie B serologic titer of 1:160
- 5- Total serum cholesterol of 9.6 mmol/l

Answer & Comments

Answer: 4- Coxsackie B serologic titer of 1:160

She has findings that suggest myocarditis, and is supported by the temperature, echo findings and markedly raised troponin. Myocarditis can have features similar to cardiomyopathy and the mild valvular disease is quite compatible. One of the most likely organisms is Coxsackie B virus.



[Q: 134] OnExamination - Cardiology

An 80 year-old male presented with palpitations of 5 hours duration. One month previously he suffered weakness of the right arm and problems with his speech which resolved within 4 hours. He was taking no medication. On examination, he was stable with a pulse of 135 beats per minute which was confirmed to be atrial fibrillation on ECG. He had a blood pressure of 112/80 mmHg, appeared clinically euthyroid. Within one hour he reverted to sinus rhythm spontaneously. Echocardiogram was normal but a 24 hour ECG revealed three episodes of atrial fibrillation each lasting around ten minutes.

Which one of the following is the most appropriate initial treatment for this patient?

- 1- Amiodarone
- 2- Aspirin

- 3- atenolol
- 4- digoxin
- 5- warfarin

Answer & Comments

Answer: 5- warfarin

The most appropriate initial therapy for this patient who has a high risk of thrombo-embolic stroke is anticoagulation with warfarin maintaining an INR between 2-2.5. This should be the initial priority as he has already had one episode of TIA. The maintenance of sinus rhythm would be the next step and amiodarone or sotalol are options.



[Q: 135] OnExamination - Cardiology

A 70-year-old man with dilated cardiomyopathy remains symptomatic in NYHA class 2 due to chronic heart failure. On examination his pulse is 90 regular, BP 140/90, heart sounds normal, chest auscultation did not reveal any abnormalities. He is currently taking Lisinopril 30 mg OD and Furosemide 80 mg OD.

What is the best treatment option?

- 1- Amiodarone
- 2- Carvedilol
- 3- Digoxin
- 4- Spironolactone
- 5- Valsartan

Answer & Comments

Answer: 2- Carvedilol

Beta blockers improve mortality and quality of life in chronic heart failure (COPERNICUS, MERIT, CIBIS trials). They should be initiated once patients are stable and can be used in all classes of heart failure though they can cause an acute deterioration in patients who have

very severe symptoms. They should be avoided in the acute setting. Spironolactone improves outcome and symptoms in severe (Class 3-4) chronic heart failure (RALES). Valsartan does not affect outcome as add on treatment (VALHEFT). Digoxin may reduce hospitalisation and improves QOL but has a neutral benefit to mortality (DIG study). Amiodarone in the absence of arrhythmias does not affect outcome.



[Q: 136] OnExamination - Cardiology

A previously well 60-year-old lady is admitted with an Acute Anterior Myocardial Infarction. A random blood glucose concentration was found to be 12.1 mmol/L (<6.7).

What is the optimal management of her blood sugar?

- 1- Diet
- 2- Gliclazide
- 3- Intravenous insulin plus dextrose
- 4- Metformin
- 5- Subcutaneous insulin

Answer & Comments

Answer: 3- Intravenous insulin plus dextrose

The DIGAMI study has demonstrated that there is a survival advantage in initially treating such patients with elevated glucose concentrations with sliding scale insulin for 24 hours post-infarct and then switching to three months subcutaneous insulin. (Almbrand B, Johannesson M, Sjostrand B, Malmberg K, Ryden L. Cost Effectiveness of Intense Insulin Treatment after Acute Myocardial Infarction in Patients with Diabetes Mellitus.

Results from the DIGAMI study Eur Heart J 2000; 21: 733-39)



[Q: 137] OnExamination - Cardiology

Which of the following regarding the anatomy of the heart is true?

- 1- The aortic valve is tricuspid.
- 2- The ascending aorta is entirely outside the pericardial sac.
- 3- The left atrial appendage is identified readily by transthoracic echocardiography.
- 4- The pulmonary trunk lies anterior to the ascending aorta.
- 5- The right atrium is posterior to the left atrium.

Answer & Comments

Answer: 1- The aortic valve is tricuspid.

The pulmonary trunk lies posterior to the aorta. The ascending aorta lies completely within the pericardium as does the pulmonary trunk. The left atrium is the most posterior chamber of the heart, the right atrium is just anterior and to the right of the left atrium. The left atrial appendage is not readily seen on transthoracic echocardiography and requires transoesophageal echocardiography.



[Q: 138] OnExamination - Cardiology

A 41 year male on routine risk factor screening is noted to have a blood pressure of 146/86 mm/Hg.

His investigations reveal:

Fasting plasma glucose 5.8 mmol/l 3.5-6
 Total cholesterol 6.2 mmol/l <5.2
 Triglyceride 12.8 mmol/l 0.5-1.7
 HDL-Cholesterol 0.8 mmol/l 0.7-1.7

Which is the most appropriate treatment for his lipid profile?

- 1- Ezetimibe
- 2- Fenofibrate

- 3- Nicotinic acid slow release
- 4- Rosuvastatin
- 5- Simvastatin

Answer & Comments

Answer: 3- Nicotinic acid slow release

This patient is likely to have type V hyperlipoproteinaemia characterised by an excess of triglyceride containing lipoproteins and an increased risk of pancreatitis. Nicotinic acid primarily reduces plasma TG levels via inhibition of hepatic TG synthesis suppressing FFA supply to the liver. It is currently the most effective TG reducing pharmacotherapy producing reductions of up to 30% in plasma TG at a dose of 2 g a day. Its use is limited by side effects mainly flushing and an exacerbation of insulin resistance. The flushing may be diminished by gradual dose escalation, consumption following a low fat snack and concomitant aspirin use. Alternative therapies in the event of intolerance to nicotinic acid include fenofibrate as a good second choice or alternatively, Omega-3 fatty acids.



[Q: 139] OnExamination - Cardiology

A 70-year-old male with a history of syncope and hypertension is found to have runs of non-sustained ventricular tachycardia during telemetry.

Investigations show a serum magnesium of 0.4 mmol/l (0.75-1).

Which one of the following is most likely to be responsible for this biochemical abnormality?

- 1- Chronic renal failure
- 2- Diuretic therapy
- 3- Elevated PTH concentrations
- 4- Hyperphosphataemia
- 5- Treatment with antacids

Answer & Comments

Answer: 2- Diuretic therapy

Diuretic therapy is a common cause of hypomagnesaemia due to increased renal excretion. It is not seen in hyperparathyroidism. Chronic renal failure and antacid therapy are both causes of hypermagnesaemia. Hypophosphatemia is seen in association with hypomagnesaemia.



[Q: 140] OnExamination - Cardiology

Cyanosis is a typical feature of which of the following conditions:

- 1- Patent ductus arteriosus.
- 2- Ventricular septal defect.
- 3- Total anomalous pulmonary venous drainage.
- 4- Atrial septal defect
- 5- Mitral atresia.

Answer & Comments

Answer: 3- Total anomalous pulmonary venous drainage.

TAPVD is associated with cyanosis in the newborn. Total anomalous pulmonary venous connection (TAPVC) consists of an abnormality of blood flow in which all 4 pulmonary veins drain into systemic veins or the right atrium with or without pulmonary venous obstruction. Systemic and pulmonary venous blood mix in the right atrium. PDA, ASD and VSD are left to right shunts. Tricuspid atresia is typically associated with cyanosis rather than Mitral.



[Q: 141] OnExamination - Cardiology

A 65-year-old male is admitted with a two hour history of central chest pain associated with sweating and nausea. A myocardial infarction is suspected.

Which of the following is an indication for thrombolytic therapy?

- 1- 1mm ST elevation in leads V2-4
- 2- 1mm ST elevation in leads II, III and aVF.
- 3- 2mm ST depression in leads V2-4
- 4- T wave inversion in lead V3-5
- 5- Q waves in leads V2-4

Answer & Comments

Answer: 2- 1mm ST elevation in leads II, III and aVF.

There are two ECG criteria for initiating thrombolysis in a patient with suspected Myocardial Infarction. The first is the presence of ST elevation of at least 1mm in the limb leads or 2mm in the chest leads on the ECG and the second is new onset of left bundle branch block (LBBB.) Also, there must also be no compelling contraindications to thrombolysis.



[Q: 142] OnExamination - Cardiology

A 73-year-old male with type 2 diabetes requires improved glycaemic control. He also suffers from heart failure which is controlled with diuretic and ACEis.

Which of the following hypoglycaemic agents is contraindicated in this patient?

- 1- Acarbose
- 2- Glipazide
- 3- Netaglinide
- 4- Repaglinide
- 5- Rosiglitazone

Answer & Comments

Answer: 5- Rosiglitazone

Rosiglitazone can result in fluid retention of unknown aetiology which may cause a mild dilutional anaemia (haemoglobin typically falls

by 1 to 2 g/dl) and ankle oedema. It is contraindicated in hepatic dysfunction and congestive heart failure. Sulphonylureas are contraindicated in renal failure: all should be stopped and insulin started if serum creatinine exceeds 250 µmol/l. The recent United Kingdom Prospective Diabetes Study found no evidence that patients treated with sulphonylureas suffered cardiovascular events more often than those treated with insulin. Contraindications of Metformin include all the major organ failures- renal, hepatic, cardiac, and respiratory. It should not be used when serum creatinine concentration exceeds 150 µmol/l. Side-effects of Acarbose are due to carbohydrate malabsorption (flatus, abdominal bloating, gassy diarrhoea).



[Q: 143] OnExamination - Cardiology

In a patient presenting with aortic stenosis, which of the following findings would be most helpful in establishing a diagnosis of congenital bicuspid valve as the etiology?

- 1- age
- 2- calcified leaflets
- 3- commissural fusion on ECHO
- 4- negative history for rheumatic fever
- 5- systolic ejection click

Answer & Comments

Answer: 5- systolic ejection click

Age and calcified aortic root suggest calcific aortic valvular disease. Rheumatic AS results from fibrosis of the leaflets and fusion of the commissures. An ejection click or ejection sound, best heard at the apex, implies that the site of the stenosis is mostly valvular and of congenital origin i.e. bicuspid valvular disease.



[Q: 144] OnExamination -
Cardiology

A 32-year-old female who is 14 weeks pregnant in her third pregnancy is found to have a blood pressure of 152/88 mmHg. There are no other abnormalities of note on examination. She has a BMI of 33.3 kg/m² and urinalysis is otherwise normal. An ECG reveals left ventricular hypertrophy.

What is the most likely aetiology of her elevated blood pressure?

- 1- Essential Hypertension
- 2- Pre-eclampsia
- 3- Pregnancy induced hypertension
- 4- Secondary hypertension
- 5- White coat (Factitious) hypertension

Answer & Comments

Answer: 1- Essential Hypertension

This woman has hypertension which is discovered in her pregnancy but has evidence of LVH on her ECG suggesting that this is longstanding. Often, it takes at least two years of sustained hypertension to develop LVH and although her pregnancy may have contributed to any deterioration, the LVH suggests that it was pre-existent. The cause for her hypertension may be secondary but her high BMI is suggestive of it being essential.



[Q: 145] OnExamination -
Cardiology

A randomised, double-blind, placebo controlled trial of a cholesterol lowering drug in the primary prevention of coronary heart disease is reported.

1000 subjects are treated with the active drug, and 1000 are given placebo. They are followed up over a five year period and 100 individuals in the placebo group and 80 in the treatment group suffer a myocardial infarction.

What is the annual percentage risk of myocardial infarction in the group treated with placebo?

- 1- 0.5%
- 2- 2%
- 3- 5%
- 4- 8%
- 5- 10%

Answer & Comments

Answer: 2- 2%

Why this question is in the MRCP exam is anyone's guess! This is more of a mathematics exam.

In the 5 years 100 patients in the placebo group develop an MI. Assuming this is spread evenly across the years this means that 20 patients (out of 1000) suffer an MI each year. The annual risk is therefore 20/1000 = 0.02 which, expressed as a percentage is 2.



[Q: 146] OnExamination -
Cardiology

A 78-year-old diabetic female presented with a two day history of melena and dizziness. She had taken an unknown analgesic four days previously. On examination she was pale with a pulse of 90 beats per minute, a blood pressure of 100/65 mmHg and a lower midline scar from an operation for intermittent claudication three months previously. Investigations revealed:

haemoglobin 8 g/dL (13.0-18.0)
faecal occult blood strongly positive
upper gastrointestinal tract endoscopy:
normal

What is the most likely cause of her upper gastrointestinal haemorrhage?

- 1- aorto-enteric fistula
- 2- gastric erosions

- 3- gastric ulcer
- 4- Mallory-Weiss syndrome
- 5- Oesophageal varices

Answer & Comments

Answer: 1- aorto-enteric fistula

The upper GI endoscopy is normal, therefore GU, gastric erosions, varices and Mallory-Weiss syndrome are unlikely. The strongly positive FOB suggest significant GI haemorrhage. Aortoenteric fistulae (AEF) are now known to occur following endovascular repair of abdominal aortic aneurysms (AAA), and secondary to aortic grafting of any kind, presumably because of mechanical forces of dislodged or migrating devices. This patient may well have had an aorto-bifemoral graft, as treatment for peripheral vascular disease.



[Q: 147] OnExamination - Cardiology

A 38-year-old woman with a 10 year history of type 1 diabetes attends for annual review. She has background diabetic retinopathy, microalbuminuria with a urine Albumin:Creatinine ratio of 4.8 mg/dl (<3 mg/dl). Currently, she takes basal bolus insulin four times daily and lisinopril. She is a non-smoker, has a BMI of 30 kg/m² and a blood pressure of 124/70 mm/hg.

Investigations reveal:

Hba1c	7.3%	<6
Total Cholesterol	5.2 mmol/l	<5.2
Triglyceride	1.9 mmol/l	0.5-1.7
LDL-Cholesterol	3.3 mmol/l	<2.6
HDL-Cholesterol	1.3 mmol/l	0.7-1.7

Which would be the most appropriate treatment for this patient's lipid profile?

- 1- Ezetimibe
- 2- Fenofibrate
- 3- No treatment required

- 4- Omega-3 fatty acids
- 5- Simvastatin

Answer & Comments

Answer: 5- Simvastatin

Type 1 diabetes after a duration of 10 years is associated with a 2% annual CHD event rate, while the risk of cardiovascular events is increased in people with type 1 diabetes by factors such as co-existing microvascular complications, in particular nephropathy. Furthermore female gender is associated with an approximate 2 fold increase in relative CVD risk in type 1 diabetes, while other factors associated with increased CVD risk in type 1 diabetes include degree of glycaemia, duration of diabetes, as well as classically recognised factors such as hypertension and dyslipidaemia. The most recent CVD treatment guidelines JBS-2 advocate that treatment targets for LDL-C and TC of < 2 and < 4 mmol/l in all people with diabetes over the age of 40 years and in those under 40 where there are co-existing risk factors, i.e. poor glycaemic control (Hba1c > 9%), co-existing microvascular complications, presence of another CVD risk factor or features of the metabolic syndrome (NCEP ATP III). Therefore in this case simvastatin would be the most appropriate treatment choice aiming for a treatment TC < 4 mmol/l. Statins are however not licensed for use in pregnancy and women of child bearing age need to be counselled regarding pregnancy issues when initiating statin therapy. Repeat lipid profile is recommended 8 weeks following initiation of therapy to enable any therapeutic adjustments to be made.



[Q: 148] OnExamination - Cardiology

Which of the following is true regarding the action of Clopidogrel?

- 1- It inhibits cyclo-oxygenase

- 2- It is an ADP receptor antagonist
- 3- It is a glycoprotein IIb/IIIa inhibitor
- 4- It is a selective factor Xa inhibitor
- 5- It is Hydroxymethyl Coenzyme A inhibitor

Answer & Comments

Answer: 2- It is an ADP receptor antagonist

Clopidogrel prevents platelet aggregation through antagonism of the ADP receptor. It has been shown to reduce mortality from stroke and IHD in primary prevention studies.



[Q: 149] OnExamination - Cardiology

An 18-year-old man had repeated episodes of breathlessness and palpitations, lasting about 20 minutes and resolving gradually. There were no abnormal physical signs.

What is the most likely cause of these features?

- 1- Drug abuse
- 2- Panic disorder
- 3- Paroxysmal supraventricular tachycardia
- 4- Personality disorder
- 5- Thyrotoxicosis

Answer & Comments

Answer: 2- Panic disorder

Drug abuse is unlikely since the symptoms are quite short lived. We would expect other symptoms such as GI disturbance, headaches or hypertension to accompany a variety of drug abuse causes. Paroxysmal SVT would start and stop suddenly, not gradually. Personality disorder and thyrotoxicosis would both be expected to lead to symptoms of longer duration with other associated symptoms. This leaves 'panic disorder' as the most likely diagnosis.



[Q: 150] OnExamination - Cardiology

A 65-year-old woman is diagnosed as having subacute bacterial endocarditis and appropriate antibiotic therapy started.

Which of the following investigation is the most useful in order to monitor her response to antibiotics?

- 1- Serum bactericidal activity
- 2- Serial blood cultures
- 3- Serum C-reactive protein concentration
- 4- Serial full blood count, monitoring the white cell count
- 5- Serial transthoracic echocardiography

Answer & Comments

Answer: 3- Serum C-reactive protein concentration

CRP is a member of the pentraxin protein family, and levels are greatly elevated during acute inflammation. CRP augments the immune response to certain antigens, activates complement, and increases the monocytic production of certain tissue factors. CRP binds to bacterial surfaces, acting as an opsonin. CRP concentrations are elevated in almost all inflammatory, infectious, and malignant diseases. Serial measurements of CRP concentrations provide a simple, effective, non-invasive means of measuring response to antibiotic therapy.



[Q: 151] OnExamination - Cardiology

A 28-year-old man who is known to have Hypertrophic Cardiomyopathy has an out of hospital cardiac arrest and is successfully resuscitated.

What is the most appropriate mode of treatment?

- 1- Alcohol Septal Ablation
- 2- Amiodarone

- 3- Beta Blocker
- 4- Implantable Defibrillator
- 5- Myomectomy

Answer & Comments

Answer: 4- Implantable Defibrillator

Patients with HCM are at increased risk of sudden cardiac death due to VF/VT. Implantable Cardio Defibrillators (ICD) are superior to Amiodarone or Beta Blockers for preventing this. Reducing outflow tract obstruction with myomectomy or Alcohol Septal Ablation does not reduce the risk of SCD.

Other indications for ICD implantation include

1. Cardiac arrest due to VF/VT
2. Sustained VT causing haemodynamic compromise
3. Chronic Heart Failure, LVEF<40% and associated syncopal episodes due to Non Sustained VTPost-MI Non Sustained VT with LVEF<40%
4. Arrhythmogenic right ventricular cardiomyopathy causing cardiac arrest
5. Congenital Long QT with family history of sudden cardiac death at young age.

For European Society of Cardiology guidelines on ICD implantation visit:

<http://medc.uni-muenster.de/medc/dienstleistungen/public/PDF/icd-esc-guidelines-2001.pdf>



[Q: 152] OnExamination - Cardiology

A 17-year-old female is found to have a cardiac murmur characterized by a mid-systolic click. An echocardiogram reveals mitral insufficiency with upward displacement of one leaflet. There is also aortic root dilation to 4 cm. She has a dislocated right ocular

crystalline lens. She dies suddenly and unexpectedly. The medical examiner finds a prolapsed mitral valve with elongation, thinning, and rupture of chordae tendineae.

A mutation involving which of the following genes is most likely have be present in this patient?

- 1- Beta-myosin
- 2- CFTR
- 3- FGFR
- 4- Fibrillin
- 5- Spectrin

Answer & Comments

Answer: 4- Fibrillin

Marfan syndrome is a connective tissue disorder that is associated with floppy mitral valve and also with cystic medial necrosis that predisposes to aortic dissection. Abnormalities of the beta-myosin gene may be associated with some forms of dilated cardiomyopathy. The CFTR gene is associated with cystic fibrosis. The obstructive lung disease from widespread bronchiectasis that results from cystic fibrosis involving the lung can lead to pulmonary hypertension with cor pulmonale. The fibroblast growth factor receptor (FGFR) gene mutations can be associated with skeletal dysplasias. The spectrin gene mutation can be associated with red cell membrane abnormalities associated with hereditary spherocytosis. Anemias in adults with this condition are not typically severe, though anemias in general can increase cardiac stress.



[Q: 153] OnExamination - Cardiology

Which of the following is true regarding mitral stenosis?

- 1- it is tolerated well in pregnancy

- 2- there is characteristically a low wedge pressure
- 3- in AF, the opening snap disappears
- 4- The opening snap is not heard when the mitral valve is heavily calcified
- 5- Doppler U/S is usually inaccurate in determining severity

Answer & Comments

Answer: 4- The opening snap is not heard when the mitral valve is heavily calcified

Mitral stenosis is typically a consequence of childhood rheumatic fever but congenital disease is well recognised. It is associated with a tapping apex beat, a loud S1, Opening snap and Mid diastolic rumble with pre-systolic accentuation in those in sinus rhythm. The opening snap is characteristically lost with heavy valvular calcification. In particular Mitral stenosis is poorly tolerated in pregnancy due to volume overload. It is well characterised by doppler echocardiography.



[Q: 154] OnExamination - Cardiology

A middle aged woman presents with new onset palpitations. She also commented that she had lost weight recently despite an increased appetite. Examination reveals a goitre and a degree of exophthalmos. During physical examination, she fell unconscious. Blood pressure was 70/40 mmHg. Electrocardiogram revealed atrial fibrillation with rapid ventricular response.

What is the appropriate immediate management?

- 1- Anticoagulation
- 2- Carbimazole
- 3- DC cardioversion
- 4- Intravenous amiodarone
- 5- Intravenous propranolol

Answer & Comments

Answer: 3- DC cardioversion

The patient is haemodynamically compromised due to AF. The emergency management is DC cardioversion 200J → 360J → 360J. Adverse signs necessitating DC cardioversion are BP ? 90mmHg, chest pain, heart failure, impaired consciousness and heart rate ? 200bpm.



[Q: 155] OnExamination - Cardiology

A 67-year-old man presents with sudden onset atrial fibrillation (ventricular rate of 150/minute). His serum creatinine concentration was 250 umol/L (70-110).

What is the main factor that determines the choice of loading dose of digoxin in this patient?

- 1- Absorption
- 2- Apparent volume of distribution
- 3- Lipid solubility
- 4- Plasma half-life
- 5- Renal clearance

Answer & Comments

Answer: 5- Renal clearance

The pharmacokinetics of digoxin are complex and best explained by a two compartment model. The loading dose is mainly dependent on the Volume of Distribution of a drug but this patient has moderate renal failure. The loading dose is calculated (using various models) by taking into account age, creatinine clearance, body surface area etc. Volume of distribution becomes important particularly when body weight is 40kg or less. On balance it is the renal failure that is the most important factor in this patient in determining the loading dose.

Digoxin is cleared by the kidneys so the maintenance dose would require adjustment in renal failure.



[Q: 156] OnExamination -
Cardiology

A 65-year-old man is referred with abnormal liver function and undergoes a liver biopsy.

Which of the following count against hepatic cirrhosis?

- 1- Fibrous septa formation
- 2- Granuloma formation
- 3- Liver cell necrosis
- 4- Nodular regeneration
- 5- Subendothelial fibrosis

Answer & Comments

Answer: 2- Granuloma formation

Granuloma formation is not classically seen in cirrhosis, which can be micro or macronodular in type. In the micronodular form, the nodules are less than 3mm across with uniform liver involvement - seen in alcohol or biliary disease. In the macronodular form, there are larger nodules, classically seen in chronic viral hepatitis.)

See some examples

<http://www.meddean.luc.edu/lumen/MedEd/orfpath/cirrhosis.htm>

<http://www.pathology.vcu.edu/education/gi/lab3.h.html>

<http://radiology.uchc.edu/eAtlas/GI/578.htm>



[Q: 157] OnExamination -
Cardiology

In the consideration of cardiac tamponade, which of the following statements is most true?

- 1- Bradycardia is common

- 2- Early diastolic descent (y descent) is exacerbated
- 3- Pulsus paradoxus is pathognomonic
- 4- Renal failure is a recognised complication
- 5- The apex beat is always absent

Answer & Comments

Answer: 4- Renal failure is a recognised complication

Tachycardia is common in the presentation of cardiac tamponade, and the apex beat is frequently palpable. The y descent is absent, though pulsus paradoxus may or may not be present.

Pulsus paradoxus is defined as an inspiratory systolic fall in arterial pressure of 10mmHg or more. Pulsus paradoxus may also be present in massive PE, haemorrhagic shock, COPD and severe hypotension. Renal failure is a recognised complication of tamponade.



[Q: 158] OnExamination -
Cardiology

A 55-year old man presented with angina pectoris. His pain was relieved by Buccal Glyceryl Trinitrate 5mg. His discharge medication was Isosorbide Mononitrate 20mg bd.

Which factor accounts for the dose difference between these two formulations?

- 1- Absorption
- 2- First pass metabolism
- 3- Lipid solubility
- 4- Phase II (conjugation) metabolism
- 5- Plasma clearance

Answer & Comments

Answer: 1- Absorption

Buccal GTN is quickly converted to di- and mono-nitrates which have half-lives of 2

hours. Its effective duration of action is 30 minutes. It is metabolized by the liver to inorganic nitrite. ISMN is not subject to first pass metabolism in the liver. The overall half-life of isosorbide mononitrate is about 5 hours and that of GTN is two hours. Thus, this would result in a reduced dose of ISMN being required if related to plasma clearance. The sublingual route (which avoids first pass effect and the need for GI absorption) is the preferred route for achieving therapeutic effect quickly as GTN is absorbed efficiently by this route. However, the total dose administered by this route must be limited to avoid excessive effects. When a much longer duration is needed, oral preparations can be given that contain a sufficient amount of drug to result in sustained systemic blood levels.



[Q: 159] OnExamination -
Cardiology

A 60-year-old woman with a two year history of diet controlled type 2 diabetes was admitted with an acute myocardial infarction. She received thrombolysis together with an insulin infusion. Investigations revealed a fasting glucose of 12 mmol/l together with a cholesterol of 6.6 mmol/l.

Which of the following is the most appropriate treatment for her subsequent glycaemic control?

- 1- diet and exercise
- 2- Gliclazide
- 3- Metformin
- 4- Rosiglitazone
- 5- subcutaneous insulin

Answer & Comments

Answer: 5- subcutaneous insulin

The most appropriate treatment for her ongoing hyperglycaemia is a further three months of subcutaneous insulin as suggested by the DIGAMI study. This study revealed

significant reductions in mortality associated with the introduction of sliding scale insulin followed by three months of subcutaneous insulin in type 2 diabetics compared with traditional therapy consisting of their usual oral hypoglycaemic agents.



[Q: 160] OnExamination -
Cardiology

A 16-year-old female attends casualty 15 hours after ingesting approximately 30g of Paracetamol and 2g of Dihydrocodeine.

On examination, she is drowsy with a Glasgow Coma Scale of 15. Her pulse is 100 beats per minute, blood pressure is 110/66 mmHg and she has pinpoint pupils, with saturations of 96% on air.

What is the most appropriate treatment for this patient?

- 1- 10% Dextrose infusion
- 2- Activated charcoal by mouth
- 3- Gastric lavage
- 4- N-Acetylcysteine intravenously
- 5- Naloxone intravenously

Answer & Comments

Answer: 4- N-Acetylcysteine intravenously

This patient has taken a significant overdose of Paracetamol, and is presenting late at 15 hours. She is at risk of hepatocellular damage and needs to be commenced on an infusion of IV N-Acetylcysteine immediately. It is continued for 30 hours and sometimes beyond this, depending on results of Prothrombin time, Liver Function Tests, Urea and electrolytes, and glucose.

Activated charcoal is given to patients presenting within 1 hour of overdose. Flumazenil is reserved for reversal of benzodiazepine induced respiratory depression. Naloxone is used for opiate-induced respiratory depression.



[Q: 161] OnExamination -
Cardiology

A 15-year-old female presents following a sore throat with chest pain, fever, and a skin rash. Examination reveals a diastolic murmur. Her ASO titre is elevated.

Which of the following is a major criterion for the diagnosis of Rheumatic fever?

- 1- Fever
- 2- Raised ESR
- 3- Polyarthrititis
- 4- Migratory erythema
- 5- Prolonged PR interval

Answer & Comments

Answer: 3- Polyarthrititis

Polyarthrititis together with erythema marginatum, Sydenham's chorea, carditis and subcutaneous nodules constitute the major criteria associated with Rheumatic fever. Minor criteria include raised ESR, Arthralgia, pyrexia and a prolonged PR interval. Migratory erythema is associated with a glucagonoma.



[Q: 162] OnExamination -
Cardiology

A 52-year-old sales representative is admitted with an inferior myocardial infarction. He receives thrombolysis and makes an uneventful recovery. He is discharged on atenolol, aspirin and atorvastatin.

He enquires how long after his MI must he wait before he is able to drive?

- 1- One week
- 2- Two weeks
- 3- Four weeks
- 4- Three months
- 5- Six months

Answer & Comments

Answer: 3- Four weeks

The DVLA are quite clear on this issue. He must wait at least 4 weeks after his MI before he is able to drive. Similarly patients undergoing surgical revascularisation must also wait 4 weeks. If he was admitted with angina and underwent PTCA then he should wait one week.



[Q: 163] OnExamination -
Cardiology

A 58-year-old man has had an enlarging abdomen for several months. He has experienced no abdominal or chest pain. On physical examination he has a non-tender abdomen with no masses palpable, but there is a fluid thrill. An abdominal Ultrasound Scan shows a large abdominal fluid collection with a small cirrhotic liver. A chest X-ray shows a globally enlarged heart.

Which of the following conditions is most likely to be present?

- 1- Dilated cardiomyopathy
- 2- Lymphocytic myocarditis
- 3- Myocardial amyloid deposition
- 4- Nonbacterial thrombotic endocarditis
- 5- Severe occlusive coronary atherosclerosis

Answer & Comments

Answer: 1- Dilated cardiomyopathy

This man has alcoholic liver cirrhosis with ascites. The cardiomyopathy of alcoholism is a dilated or congestive form.



[Q: 164] OnExamination -
Cardiology

A previously well 27-year-old woman presents with a history of transient ischaemic attack affecting her right side and speech. She had returned to the United Kingdom from a

holiday in New Zealand two days previously. On examination there was nothing abnormal to find. An ECG, chest X-ray, CT brain scan and routine haematology and biochemistry were all normal.

What is the most likely underlying abnormality?

- 1- atrial myxoma
- 2- carotid artery stenosis
- 3- embolus from paroxysmal atrial fibrillation
- 4- patent foramen ovale
- 5- subarachnoid haemorrhage

Answer & Comments

Answer: 4- patent foramen ovale

This is a typical cause of stroke in a young person due to prolonged immobility. Deep vein thrombosis with patent foramen ovale will cause paradoxical embolism and stroke.



[Q: 165] OnExamination - Cardiology

A 69-year-old man is treated for chest infection. He has been on a stable dose of warfarin for the last six months as a treatment for atrial fibrillation, with INR recordings between 2-2.5. However, his most recent INR was 5.

Which one of the following drugs that has recently been started is likely to be responsible for the increased INR.

- 1- Clarithromycin
- 2- Co-dydramol
- 3- Digoxin
- 4- Rifampicin
- 5- Temazepam

Answer & Comments

Answer: 1- Clarithromycin

Clarithromycin induces the anticoagulant effect of warfarin whereas, rifampicin would reduce the anticoagulant effect. Ciprofloxacin and sulphonamides will also increase the anticoagulant effect of warfarin. Temazepam, digoxin and codeine have no appreciable effect.



[Q: 166] OnExamination - Cardiology

A 69-year-old woman admitted for a surgical procedure is noted to have a soft systolic murmur at the left sternal edge. Her ECG and chest X-ray were normal and transthoracic echocardiography revealed a small posterior pericardial effusion with normal valves.

Which of the following would be the most appropriate next step in this patient's management?

- 1- A diagnostic Pericardial aspiration
- 2- mammography
- 3- purified Protein derivative test for tuberculosis
- 4- reassurance
- 5- right heart catheterisation

Answer & Comments

Answer: 4- reassurance

The presence of a small pericardial effusion on echo is quite common and in this patient who otherwise appears well, no further action is required.



[Q: 167] OnExamination - Cardiology

A publication reports the outcome of a new statin therapy in a placebo controlled primary prevention study of ischaemic heart disease in a diabetic population. 1000 patients were randomised to receive the new therapy and 1000 allocated to placebo. The study was completed over a five year period. In the

placebo group there were 150 Myocardial infarcts and in the group treated with the new statin there were 100 infarcts.

What is the annual percentage of myocardial infarction in the diabetic population treated with placebo?

- 1- 1%
- 2- 3%
- 3- 5%
- 4- 7%
- 5- 10%

Answer & Comments

Answer: 2- 3%

This study shows that there are 150 MIs in 1000 diabetic patients treated over a five year period in the placebo group. Hence the rate of infarction in this group is $150/1000=15\%$, divided by 5 years to give the annual MI rate of 3%.



[Q: 168] OnExamination - Cardiology

A study reports on the results of a large study of the primary prevention of stroke in a diabetic population using a new antiplatelet agent versus aspirin. The results of the study reveal that over a 5 year period the incidence of stroke in the aspirin treated group is 3% compared to a rate of 1.5% in the group treated with the new antiplatelet agent ($p<0.001$).

What is the relative risk reduction in stroke associated with the new drug?

- 1- 1.5%
- 2- 15%
- 3- 30%
- 4- 40%
- 5- 50%

Answer & Comments

Answer: 5- 50%

The relative risk reduction is another calculation important for the interpretation of publications. In this case there is an absolute risk reduction of 1.5% ($3 - 1.5\%$) in stroke afforded by the new agent compared with aspirin yet the relative risk reduction is $1.5/3=50\%$. That is 50% fewer strokes may be prevented by the use of the newer agent compared with aspirin, although this would be the equivalent of 15 per 1000 patients treated (30 strokes expected/1000 patients treated with aspirin but only 15 with the new drug).



[Q: 169] OnExamination - Cardiology

A 30-year-old man presented with a history of transient loss of consciousness and palpitation. His ECG showed ventricular tachycardia.

Which one of the following treatments should be avoided?

- 1- Adenosine
- 2- Amiodarone
- 3- DC cardioversion
- 4- Flecainide
- 5- Verapamil

Answer & Comments

Answer: 5- Verapamil

Verapamil may cause fatal hypotension in VT (due to negative inotropic and peripheral vasodilatory effects). Flecaïnide should be used with caution because it may produce an incessant form of VT, which is difficult to control. Adenosine is used to differentiate SVT with right (or left), bundle branch block from VT.



[Q: 170] OnExamination -
Cardiology

A 40-year-old female with mitral stenosis consults for advice regarding operative procedures.

In which of the following circumstances would antibiotic prophylaxis of infective endocarditis be required?

- 1- Cardiac catheterisation
- 2- Caesarian section
- 3- Dental scaling
- 4- Removal of a lipoma
- 5- Termination of pregnancy

Answer & Comments

Answer: 3- Dental scaling

Dental scaling is regarded as a high risk procedure and should be covered by antibiotic prophylaxis.



[Q: 171] OnExamination -
Cardiology

A 27-year-old woman complained of palpitations, breathlessness and chest pain, radiating to the left arm. These symptoms had developed six weeks previously, after she had witnessed her father dying from a myocardial infarction. In the past 10 years she had been investigated for abdominal pain, headaches, joint pains, and dyspareunia, without serious cause being found for these symptoms.

What is the most likely diagnosis?

- 1- Depressive episode
- 2- Factitious disorder
- 3- Generalized anxiety disorder
- 4- Obsessive compulsive disorder
- 5- Somatization disorder

Answer & Comments

Answer: 5- Somatization disorder

Although the brief scenario does not have quite enough criteria to fulfill a diagnosis there is enough to make somatization disorder the most likely answer. Somatization disorder is characterized by multiple recurring pains and gastrointestinal, sexual, and pseudo-neurologic symptoms that occur over a period of years. To meet the diagnostic criteria for somatization disorder, the patients' physical complaints must not be intentionally induced and must result in medical attention or significant impairment in social, occupational, or other important areas of functioning. By definition, the first symptoms appear in adolescence and the full criteria are met by 30 years of age. Of all the other disorders "factitious disorder" would seem the least likely. The other three are possible explanations but not as likely as somatization.



[Q: 172] OnExamination -
Cardiology

A 16-year-old male presents with acute severe asthma. On examination his peripheral pulse volume fell during inspiration.

Which one of the following is the most likely explanation for this clinical sign?

- 1- The cardiac effect of high dose beta agonist bronchodilator drugs
- 2- A falling heart rate on inspiration
- 3- Myocardial depression due to hypoxia
- 4- Peripheral vasodilatation
- 5- Reduced left atrial filling pressure on inspiration

Answer & Comments

Answer: 5- Reduced left atrial filling pressure on inspiration

This patient is demonstrating pulsus paradoxus. The right heart responds directly to changes in intrathoracic pressure, while the filling of the left heart depends on the

pulmonary vascular volume. At high respiratory rates, with severe air flow limitation (eg acute asthma) there is an increased and sudden negative intrathoracic pressure on inspiration and this will enhance the normal fall in blood pressure.



[Q: 173] OnExamination - Cardiology

A 70-year-old woman with established aortic stenosis attends for annual review.

Which one of the following factors is the most important in deciding the timing of surgery?

- 1- Aortic valve gradient of 50 mmHg
- 2- Left ventricular hypertrophy
- 3- Valvular calcification
- 4- The Patient's symptomatology
- 5- The intensity of the murmur

Answer & Comments

Answer: 4- The Patient's symptomatology

The patient's symptomatology is probably the most important determinant in terms of the decision to operate. Dyspnoea, chest pain and syncope are all features of aortic stenosis and when present suggest a poor prognosis if left. A gradient of 50mmHg would be regarded as moderate - severe aortic stenosis but if asymptomatic nothing would be done. LVH is a common feature of AS and does not influence the decision for surgery. Calcific aortic disease is not of itself important and the gradient should be considered.



[Q: 174] OnExamination - Cardiology

A 54-year-old man presents with central crushing chest pain. Examination is normal. 12-lead ECG shows ST segment elevation in leads II, III, aVF and ST depression in V1, V2 and V3.

Which coronary artery is occluded?

- 1- Circumflex
- 2- Left Anterior Descending
- 3- Left Main Stem
- 4- Obtuse Marginal
- 5- Right Coronary Artery

Answer & Comments

Answer: 5- Right Coronary Artery

The ECG describes an infero-posterior MI. This territory is supplied by a dominant Right Coronary Artery. The concept of coronary dominance refers to which coronary artery supplies the posterior descending coronary artery. In the case of approximately 85% of patients this is the right coronary artery with about 15% of patients having a dominant left circumflex. The territories supplied by the arteries are as follows:

" Circumflex: Lateral

" Left Anterior Descending: Anterior and septum

" Left Main Stem: Branches into the Left Anterior Descending artery and Circumflex and supplies most of the left ventricle. Complete Left Main Stem occlusion is invariably fatal.

" Obtuse Marginal: One of the branches of the circumflex and supplies the 'high lateral' region of the left ventricle (ECG leads I and aVR).

Basic understanding of coronary anatomy is important, as this is predictive of problems following MI. For example, the right coronary artery supplies the AV node, so heart block following inferior MI is common. However, heart block following anterior MI is a grave prognostic marker as this indicates a large anterior wall infarct. The right coronary system also supplies the right ventricle, hence problems relating to a right ventricular infarct are commonly associated with an inferior MI.



[Q: 175] OnExamination -
Cardiology

Which of the following anti-microbials is associated with prolongation of the QT interval?

- 1- Co-amoxiclav
- 2- Gentamicin
- 3- Cefuroxime
- 4- Erythromycin
- 5- Isoniazid

Answer & Comments

Answer: 4- Erythromycin

The macrolides are associated with a prolongation of the QT interval. Other antimicrobials associated with prolonged QT include quinine, levofloxacin.



[Q: 176] OnExamination -
Cardiology

A 57-year-old man develops deep venous thrombosis during a hospitalization for prostatectomy. He exhibits decreased mental status with right hemiplegia, and a CT scan of the head suggests an acute cerebral infarction in the distribution of the left middle cerebral artery. A chest X-ray reveals cardiac enlargement and prominence of the main pulmonary arteries that suggests pulmonary hypertension. His serum troponin I is <0.4 ng/mL.

Which of the following lesions is most likely to be present on echocardiography?

- 1- Coarctation of the aorta
- 2- Dextrocardia
- 3- Pulmonary stenosis
- 4- Tetralogy of Fallot
- 5- Ventricular septal defect

Answer & Comments

Answer: 5- Ventricular septal defect

This is 'paradoxical embolus' from right to left. This can only happen if there is a defect that allows passage from right-to left. This can happen across a patent foramen ovale. In this case, the pulmonary hypertension suggests that there may have been a shunt persistent for a long time - Eisenmenger complex. An atrial or a ventricular septal defect can provide the shunt.



[Q: 177] OnExamination -
Cardiology

During auscultation of the heart you discover a wide fixed splitting of the second heart sound.

In which of the following conditions does this occur?

- 1- an uncomplicated ASD
- 2- Fallot's tetralogy
- 3- aortic stenosis
- 4- Right Bundle Branch Block
- 5- constrictive pericarditis

Answer & Comments

Answer: 1- an uncomplicated ASD

There is a single sound in Fallot's because of an absent P2. Aortic stenosis leads to reversed splitting (also seen with LBBB and ventricular pacemaker). In RBBB there is wide splitting of S2 but it is not fixed.



[Q: 178] OnExamination -
Cardiology

A 65-year-old male with left ventricular systolic dysfunction was dyspnoeic on climbing stairs but not at rest. The patient was commenced on Ramipril and Furosemide.

Which one of the following drugs would improve the patient's prognosis further?

- 1- Amiodarone
- 2- Digoxin
- 3- Diltiazem
- 4- Metoprolol
- 5- Isosorbide Mononitrate

Answer & Comments

Answer: 4- Metoprolol

This patient has NYHA grade II heart failure and is already receiving ACE-Inhibitors and diuretics. Studies such as CIBIS, MERIT HF and COPENICUS clearly demonstrate the advantage of beta blockers even with severe heart failure.



[Q: 179] OnExamination - Cardiology

A 17-year-old girl is short in stature for her age. She has not shown any changes of puberty. She has a webbed neck. Her vital signs include Temperature 36.6° Respiratory rate 18/min Pulse 75 bpm and BP 165/85 mmHg. On physical examination, she has a continuous murmur heard over both the front of the chest as well as her back. Her lower extremities are cool with poor capillary filling. A chest radiograph reveals a prominent left heart border, no oedema or effusions, and rib notching.

Which of the following pathologic lesions best explains these findings?

- 1- Constriction of the aorta past the ductus arteriosus
- 2- Lack of development of the spiral septum and partial absence of conus musculature
- 3- Shortening and thickening of chordae tendineae of the mitral valve
- 4- Single large atrioventricular valve
- 5- Supravalvular narrowing in the aortic root

Answer & Comments

Answer: 1- Constriction of the aorta past the ductus arteriosus

She has coarctation of the aorta, and the constriction is postductal, allowing prolonged survival. Her physical characteristics also suggest Turner syndrome (monosomy X).



[Q: 180] OnExamination - Cardiology

A 65-year-old man has longstanding stable heart failure treated with furosemide and enalapril. He complains of swelling in his left knee and his GP treats him with Celecoxib, a cyclo-oxygenase-2 (COX-2) inhibitor. Two weeks later the patient has increasing breathlessness and ankle oedema.

Which one of the following effects of celecoxib is the most likely to explain his symptoms?

- 1- decreased absorption of furosemide from the gut
- 2- decreased myocardial contractility
- 3- reduced effective action of enalapril
- 4- the onset of anaemia
- 5- the onset of fluid retention

Answer & Comments

Answer: 5- the onset of fluid retention

Celecoxib (rofecoxib has been withdrawn) acts by inhibiting prostaglandin synthesis via inhibition of cyclooxygenase-2 (COX-2). It causes fluid retention and can worsen an already pre-existing heart failure as in this case. The CSM reminds prescribers that celecoxib is contraindicated in patients with severe congestive heart failure, active peptic ulceration or GI bleeding.



[Q: 181] OnExamination - Cardiology

A 50-year-old male is admitted with a 3 hour

history of central chest pain sweating and nausea. He has no relevant past medical history although his father died of an MI at the age of 48 and he is a smoker of 5 cigarettes per day. He currently takes no medication. He is seen in the morning on the consultant ward round 12 hours after admission and his pain has now settled. Examination reveals no specific abnormality and his ECG is normal.

Which of the following investigations would be most appropriate for this patient?

- 1- Coronary Angiography
- 2- Echocardiography
- 3- Endoscopy
- 4- Exercise ECG
- 5- Troponin T

Answer & Comments

Answer: 5- Troponin T

This smoker has a good history of angina and a strong family history of IHD. The most appropriate investigation would be a troponin T concentration would be highly specific and sensitive for IHD if elevated. An exercise test is relevant only after an acute coronary event has been excluded (by troponin T). If positive then angiography should be performed.



[Q: 182] OnExamination - Cardiology

Concerning complete atrioventricular septal defects which of the following statements is true?

- 1- are seen frequently in patients with trisomy 21
- 2- frequently have aortic valve insufficiency
- 3- have a normal mitral valve structure
- 4- include a coronary sinus atrial septal defect
- 5- include a perimembranous ventricular septal defect

Answer & Comments

Answer: 1- are seen frequently in patients with trisomy 21

Partial AV canal defect or ostium primum ASD

Complete AV septal defect Large deficiency in the atrial and ventricular septa. Commonly AV valve orifice and the commonest defect associated with Down's syndrome.



[Q: 183] OnExamination - Cardiology

A 60-year-old male diabetic presents to clinic for advice on prevention of a further heart attack after having sustained a myocardial infarction five years previously. He takes metformin 500 mg tds, bendroflumethiazide 2.5 mg daily and aspirin 150 mg daily. His body mass index was 33.5 kg/m², with a pulse of 82 beats per minute regular and a blood pressure of 152/92 mmHg. His cholesterol concentration is 3.3 mmol/l (< 5.5).

What is the most appropriate strategy for this patient?

- 1- 24 hour ambulatory ECG
- 2- Atorvastatin
- 3- Increase aspirin from 150 mg to 300 mg daily
- 4- Orlistat
- 5- Ramipril

Answer & Comments

Answer: 5- Ramipril

The most appropriate strategy for secondary prevention would involve further blood pressure reduction with an ACEi which would not only reduce CV risk as suggested by the HOPE study but also reduce microvascular risk as revealed by UKPDS. The NCEP ATP III criteria suggest a cholesterol less than 4 and this patient already has a low and would not benefit as much from the addition of a statin.

The increase of aspirin from 150 to 300 mg would offer no added advantage. Orlistat is used under specific criteria for weight reduction and has, as yet, not been shown to reduce CV risk in T2DM. There's no reason here for a 24 hr tape.



[Q: 184] OnExamination - Cardiology

A study reveals an immediate rise in blood pressure following infusion of a hormone in normal volunteers.

Which of the following is the most likely hormone used in this study?

- 1- angiotensin I
- 2- angiotensin II
- 3- atrial natriuretic peptide (ANP)
- 4- brain natriuretic peptide (BNP)
- 5- prolactin

Answer & Comments

Answer: 2- angiotensin II

Angiotensin II when infused intravenously produces an immediate rise in blood pressure being a potent vasoconstrictor. Both BNP and ANP result in natriuresis and lowering of blood pressure. Prolactin has no specific effect.



[Q: 185] OnExamination - Cardiology

Which ONE of the following is a contraindication to thrombolysis?

- 1- age over 75 years
- 2- the presence of atrial fibrillation
- 3- asthma
- 4- pregnancy
- 5- background diabetic retinopathy

Answer & Comments

Answer: 4- pregnancy

Those over 75 years benefit as much or more than younger MI patients from thrombolysis. Proliferative diabetic retinopathy is a relative contraindication. Important contraindications to thrombolysis include pregnancy, GI bleeding, heavy vaginal bleeding, recent stroke or surgery, uncontrolled severe hypertension, GI malignancy and prolonged CPR (more than half an hour).



[Q: 186] OnExamination - Cardiology

A 19-year-old girl presents with recurrent episodes of loss of consciousness.

Over the last two years she has had blackouts which last approximately 2 minutes. They typically occur when she is standing. These have occurred more frequently over the last week. The last episode was witnessed by her boyfriend who noted that she collapsed without any abnormal movements. On coming round she was rather drowsy initially but generally fine and recovered relatively quickly.

What is the most likely diagnosis?

- 1- Addison's disease
- 2- Atonic seizures
- 3- Cardiac syncope
- 4- Complex partial seizures
- 5- Vasovagal syncope

Answer & Comments

Answer: 5- Vasovagal syncope

This young girl has features suggestive of vasovagal syncope. The story suggests that the episodes always occur when she is standing (whereas cardiac syncope could occur at any time but may be precipitated by exercise), that there are no abnormal movements (making epilepsy less likely) and that there is a pretty full recovery (again making epilepsy less likely).



[Q: 187] OnExamination -
Cardiology

A 65-year-old woman undergoes temporary pacing due to complete heart block following acute myocardial infarction.

Which coronary artery is most likely to have been occluded?

- 1- Anterior descending
- 2- Circumflex
- 3- Left main coronary
- 4- Obtuse marginal
- 5- Right coronary

Answer & Comments

Answer: 5- Right coronary

Myocardial infarction complicated by bradycardia is most commonly seen in inferior wall myocardial infarction. This area of the heart is supplied by the Right coronary artery. The right coronary artery gives off branches to the sinus node and AV node therefore disease within this vessel can cause damage to the cardiac conducting system and can therefore lead to bradyarrhythmias.



[Q: 188] OnExamination -
Cardiology

Which of the following investigations is used to monitor the treatment of infective endocarditis?

- 1- Blood culture
- 2- C Reactive Protein
- 3- Echocardiography
- 4- Erythrocyte Sedimentation Rate
- 5- Serum bactericidal titres of antibiotics

Answer & Comments

Answer: 2- C Reactive Protein

Serum bactericidal titres against the infecting organism are no longer recommended. There

was always great variation in the monitoring methods used for these tests and in the interpretation of their results. At best they could only predict bacteriological not clinical cure and bacteriological failure is very rare. The most useful laboratory test for monitoring the response to treatment (which is usually obvious clinically) is serial C-reactive protein estimation. This is of much more use than the erythrocyte sedimentation rate, which is much slower to fall.



[Q: 189] OnExamination -
Cardiology

A 70-year-old male was receiving amiodarone 200 mg daily for intermittent atrial fibrillation. However, he was aware of tiredness and lethargy. He appeared clinically euthyroid with no palpable goitre. Investigations revealed:

Serum Free T₄ 23pmol/L (9-26)

Serum total T₃ 0.8 nmol/L (0.9-2.8)

Serum TSH 8.2 mU/L (<5)

Which of the following statements would explain these results?

- 1- Abnormal thyroxine binding globulin
- 2- Amiodarone-induced hypothyroidism
- 3- 'sick euthyroid' syndrome
- 4- Spontaneous hypothyroidism
- 5- TSH secreting pituitary adenoma

Answer & Comments

Answer: 2- Amiodarone-induced hypothyroidism

The results show normal T₄, low T₃ with elevated TSH. These results are typical of amiodarone induced hypothyroidism which inhibits the peripheral conversion of T₄ to T₃.



[Q: 190] OnExamination -
Cardiology

You wish to calculate a patient's ejection

fraction as the patient complains of dyspnoea.

Which of the following echocardiographic measures would be mandatory?

- 1- Aortic valve peak velocity
- 2- Pulse wave of mitral inflow
- 3- Left ventricular end diastolic diameter
- 4- M-mode of the mitral valve
- 5- M-mode of the aortic valve

Answer & Comments

Answer: 3- Left ventricular end diastolic diameter

One way of measuring ejection fraction is estimated by the ratio between the M-mode readings of the left ventricular end diastolic diameter divided by the end systolic diameter.



[Q: 191] OnExamination - Cardiology

An elderly man with a history of asthma, congestive heart failure, and peptic ulcer disease is admitted with bronchospasm and rapid atrial fibrillation. He receives frequent nebulised salbutamol and IV digoxin loading, his regular medications are continued. 24 hours after admission his serum potassium is noted to be 2.8 mmol/l.

Which of his medications is most likely to have caused this abnormality.

- 1- Digoxin
- 2- ACE inhibitor
- 3- Salbutamol
- 4- Ranitidine
- 5- Spironolactone

Answer & Comments

Answer: 3- Salbutamol

Salbutamol given in regular nebulised doses or IV is commonly associated with hypokalaemia. Spironolactone and ACE inhibitors commonly

cause hyperkalaemia (their use in combination is potentially dangerous and requires regular monitoring of serum electrolytes). Electrolyte disturbance with Ranitidine is very uncommon. Digoxin doesn't cause hypokalaemia (unless due to vomiting associated with digoxin toxicity). Hypokalaemia (usually diuretic induced) does increase cardiac sensitivity to Digoxin and correction of hypokalaemia is recommended to avoid arrhythmias.



[Q: 192] OnExamination - Cardiology

A 16-year old girl was incidentally found to have delta wave on ECG suggestive of Wolff-Parkinson-White syndrome. There was no tachycardia and she was asymptomatic.

What is the next step in management?

- 1- Beta-blocker therapy
- 2- Electrophysiological study and provocation of arrhythmia
- 3- Radiofrequency catheter ablation of the bypass tract
- 4- Reassurance
- 5- Repeat ECG

Answer & Comments

Answer: 4- Reassurance

The ECG appearances of a delta wave occur in approximately 1.5 per 1000 of the population, but many individuals never experience paroxysmal tachycardias. The degree of pre-excitation during sinus rhythm is variable: it may be intermittent if the refractory period of the accessory pathway is close to the sinus cycle length, or inapparent if the delta wave is obscured due to rapid AV nodal conduction. Radiofrequency catheter ablation of bypass tracts is possible in >90% of patients and is the treatment of choice in patients with symptomatic arrhythmias.



[Q: 193] OnExamination -
Cardiology

A 55-year-old woman has had worsening shortness of breath for several years. She now has to sleep sitting up on two pillows. She has difficulty swallowing. There is no history of chest pain. She is afebrile. Recently, she suffered a stroke with left hemiparesis. A chest X-ray reveals a near-normal left ventricular size with a prominent left atrial border.

Which of the following conditions is most likely to account for these findings?

- 1- Aortic coarctation
- 2- Cardiomyopathy
- 3- Essential hypertension
- 4- Left renal artery stenosis
- 5- Mitral valve stenosis

Answer & Comments

Answer: 5- Mitral valve stenosis

Mitral valve stenosis leads to left atrial enlargement, but the left ventricle is usually small. An enlarged left atrium may lead to pressure posteriorly on the oesophagus. Most mitral valvular disease in adults results from rheumatic heart disease.



[Q: 194] OnExamination -
Cardiology

A 74-year-old man presented with acute pain, pallor and absent pulses in his right leg. Investigations revealed an embolus in his femoral artery.

What is the most likely source of this embolus?

- 1- marantic endocarditis
- 2- paradoxical emboli
- 3- rheumatic endocardial vegetations
- 4- right ventricular thrombi
- 5- thrombi from an atheromatous aorta

Answer & Comments

Answer: 5- thrombi from an atheromatous aorta

Ulceration of an atheromatous plaque of the abdominal aorta is the most common source of emboli in this situation. Right ventricular thrombi would embolise to the lung. The others are possible but less likely causes.



[Q: 195] OnExamination -
Cardiology

A 65-year-old female presents with heart failure. Her echocardiogram shows a restrictive cardiomyopathy but with structurally normal valves.

Which one of the following is the most likely cause?

- 1- amyloidosis
- 2- coxsackie infection
- 3- Down's syndrome
- 4- Marfan's syndrome
- 5- Turner's syndrome

Answer & Comments

Answer: 1- amyloidosis

The diagnosis is amyloidosis which causes an infiltrative restrictive cardiomyopathy typically in patients of this age group. Other causes include sarcoidosis, radiotherapy, systemic sclerosis and carcinoid syndrome. Cocksackie produces a viral myocarditis with the likelihood of a dilated appearance on echo. Marfan's is likely to cause valvular regurgitant defects and a dilated cardiomyopathy. Down's syndrome is more likely to be associated with AV canal defects and consequent dilatation. Turner's syndrome is associated with atrial septal defects and co-arctation and bicuspid valvular defects.



[Q: 196] OnExamination -
Cardiology

A 72-year-old woman presented with acute severe chest pain with an ECG revealing ST segment elevation in leads II, III and aVF. She was treated with thrombolysis but two days later became acutely unwell. Examination revealed a loud systolic murmur at the apex which radiated into the axilla with associated pulmonary oedema.

What is the most likely diagnosis?

- 1- Acute left ventricular failure
- 2- Cardiogenic shock
- 3- pericarditis
- 4- Ruptured papillary muscle
- 5- Ventricular septal defect

Answer & Comments

Answer: 4- Ruptured papillary muscle

The most likely explanation in this patient with a prior inferior myocardial infarct is mitral valve prolapse due to papillary muscle rupture.



[Q: 197] OnExamination -
Cardiology

A 21 year-old woman has a history of palpitations and light headedness. ECG shows short PR interval and inferior Q waves. Her symptoms improve with atenolol 25 mg/day but she has had two short episodes of similar symptoms in the previous 24 hours.

What is the long-term management of choice?

- 1- Anticoagulation.
- 2- Oral amiodarone.
- 3- Oral digoxin.
- 4- Increase the dose of atenolol.
- 5- Radiofrequency ablation.

Answer & Comments

Answer: 5- Radiofrequency ablation.

WPW can be associated with negative delta waves in II, III and aVF. The longterm management of choice is ablation of the accessory pathway.



[Q: 198] OnExamination -
Cardiology

A 56-year-old male with left ventricular systolic dysfunction was dyspnoeic on climbing stairs but not at rest. The patient was commenced on ramipril and furosemide.

Which one of the following drugs would improve the patient's prognosis?

- 1- Amiodarone
- 2- Amlodipine
- 3- Bisoprolol
- 4- Digoxin
- 5- Nitrate therapy

Answer & Comments

Answer: 3- Bisoprolol

This patient has NYHA stage II heart failure. Studies such as CIBIS-II and MERIT-HF reveal that β -blockers significantly reduce morbidity and mortality in heart failure.



[Q: 199] OnExamination -
Cardiology

A 58-year-old man presents with sudden onset chest pain. He has a known history of ischaemic heart disease. ECG shows ST segment elevation in V1-V5 without reciprocal depression.

In which territory is the infarction most likely to have take place?

- 1- Anterior
- 2- Inferior
- 3- Lateral

4- Inferio-lateral

5- Posterior

Answer & CommentsAnswer: 1- Anterior

This MI is likely to be in the LAD and represents an anterior MI.


**[Q: 200] OnExamination -
Cardiology**

A 65-year-old man presents with severe central crushing chest pain. ECG shows evidence of an inferior myocardial infarction. He receives TPA, Heparin and Aspirin. Four hours after initial presentation, he starts feeling dizzy and breathless. His pulse is 40 bpm regular, BP 80/50. Heart sounds are soft and chest clear to auscultation. ECG shows 2:1 AV block with T wave inversion inferiorly. IV atropine was administered but had no effect.

What is the next most important treatment?

- 1- IV Dopamine.
- 2- IV Isoprenaline.
- 3- Insert a permanent pacemaker.
- 4- Insert a temporary pacemaker.
- 5- Monitor his progress.

Answer & CommentsAnswer: 4- Insert a temporary pacemaker.

This patient has had an inferior MI which is commonly associated with conduction abnormalities. He now develops heart block which leaves him bradycardic, symptomatic and with a low BP. Isoprenaline is contraindicated in acute MI due to its positive inotropic effects and arrhythmogenic potential. A temporary wire would deal with the situation until the inferior MI has fully resolved. He is unlikely to need a Permanent Pacemaker.


**[Q: 201] OnExamination -
Cardiology**

A 29-year-old female attends A&E complaining of acute onset of palpitations. She is attached to a cardiac monitor and her pulse rate is 180bpm. She is warm and well perfused, her BP is 135/80 mmHg, respiratory rate 20/min, oxygen saturation 100% on air and on auscultation her chest is clear with no evidence of cardiac failure. ECG shows a narrow complex tachycardia. Carotid massage and valsalva manoeuvre have failed to attenuate the rhythm disturbance.

What is the appropriate initial management?

- 1- DC Cardioversion
- 2- IV Adenosine
- 3- IV Amiodarone
- 4- IV Digoxin
- 5- IV Magnesium

Answer & CommentsAnswer: 2- IV Adenosine

This patient has a narrow complex supraventricular tachycardia. From history and examination she is not haemodynamically compromised and, therefore, initial management would be IV adenosine in the absence of contraindication (e.g. asthma) in order to create a transient conduction delay. This may terminate the tachycardia, or cause a slowing in rate to allow identification of the underlying rhythm, to guide optimal anti arrhythmic therapy. If the patient had chest pain, hypotension, SBP <90 mmHg, or evidence of cardiac failure, then DC cardioversion is indicated.


**[Q: 202] OnExamination -
Cardiology**

A 48-year-old male is referred with impotence. He has a history of angina, hypertension and type 2 diabetes.

Which one of the following drugs that he takes would present a contra-indication to him be able to receive Sildenafil?

- 1- Aspirin
- 2- Bendroflumethiazide
- 3- Isosorbide Mononitrate
- 4- Lisinopril
- 5- Metformin

Answer & Comments

Answer: 3- Isosorbide Mononitrate

Nitrates and Sildenafil are contra-indicated due to the precipitant drops in blood pressure. Viagra is also associated with increases in intra-ocular pressure so should be avoided in glaucoma, hereditary retinal disease and in those with hypotension.



[Q: 203] OnExamination - Cardiology

A 72-year-old man with type II diabetes mellitus presented following the sudden onset of palpitations. An ECG revealed rapid atrial fibrillation. He was commenced on Amiodarone but the atrial fibrillation persisted.

Which of the following has been shown to be of greatest benefit in reducing his future risk of vascular events?

- 1- Anticoagulation
- 2- Aspirin
- 3- Continuation of Amiodarone
- 4- DC cardioversion
- 5- Digoxin

Answer & Comments

Answer: 1- Anticoagulation

Both sustained and paroxysmal atrial fibrillation are associated with a relatively high incidence of thromboembolism and stroke.

Clinical trials have demonstrated that warfarin reduces the risk of stroke in patients with AF. This benefit outweighs the risk of bleeding.



[Q: 204] OnExamination - Cardiology

A 63-year-old man presents with recurrent pleural effusions. His Chest X-ray is shown.

On examination in clinic his hands showed the following.

What is the diagnosis?

- 1- Chronic Mucocutaneous Candidiasis
- 2- Iron deficiency
- 3- Ochronosis
- 4- Polychondritis
- 5- Yellow Nail Syndrome

Answer & Comments

Answer: 5- Yellow Nail Syndrome

This is Yellow Nail Syndrome where the nails are yellow, thickened, curved, stop growing and may become detached from the nailbed. Associated findings include lymphoedema, bronchiectasis and pleural effusions.



[Q: 205] OnExamination - Cardiology

A 63-year-old male is admitted with a 30 minute history of central chest pain associated with nausea and sweating. His ECG reveals ST elevation in leads II, III and aVF.

Which of the following coronary arteries is most likely to be occluded?

- 1- Circumflex artery
- 2- Left anterior descending artery
- 3- Obtuse marginal artery
- 4- Posterolateral artery
- 5- Right coronary artery

Answer & Comments

Answer: 5- Right coronary artery

The patient has had an inferior MI and this is most likely due to occlusion of the right coronary artery. LAD occlusion results in anterior infarction; circumflex or lateral branch of the LAD results in lateral infarction. RCA occlusion may also cause posterior infarction



[Q: 206] OnExamination - Cardiology

A 42 year-old male admitted with dyspnoea is noted to have a murmur suggestive of mitral stenosis.

The presence of which of the following clinical signs suggests that the mitral valve is mobile?

- 1- fourth heart sound
- 2- loud second heart sound
- 3- opening snap
- 4- a soft first heart sound
- 5- a third heart sound

Answer & Comments

Answer: 3- opening snap

Features of Mitral stenosis include the loud first heart sound, opening snap and if in sinus rhythm, a pre-systolic accentuation. Calcification of the valve results in immobility and loss of the opening snap.



[Q: 207] OnExamination - Cardiology

A 62-year-old male undergoes cardioversion for idiopathic atrial fibrillation. Post-procedure he was shown to be in sinus rhythm. Medication at admission included Warfarin digoxin and atenolol which he had been taking for the last six weeks.

Which of the following agents should he continue to take until he is seen in clinic in six weeks time.

- 1- Aspirin
- 2- Atenolol
- 3- Digoxin
- 4- Sotalol
- 5- Warfarin

Answer & Comments

Answer: 5- Warfarin

This patient has undergone successful cardioversion for idiopathic AF and needs to remain on warfarin as his risk of further thromboembolism as his Atria are now contracting normally remains high up until six weeks after achieving sinus rhythm. Digoxin is not required post procedure as neither it nor atenolol maintain sinus rhythm. Aspirin is not as good as warfarin in preventing thromboembolic disease. Sotalol, like amiodarone is good at chemical cardioversion and maintaining SR but its role post cardioversion is uncertain.



[Q: 208] OnExamination - Cardiology

A 76-year-old woman presented with an acute myocardial infarction. The ECG showed ST segment elevation in leads II, III and a VF.

Which coronary artery is most likely to be occluded?

- 1- Circumflex artery
- 2- Diagonal branch of the left anterior descending artery
- 3- Left anterior descending artery
- 4- Left Coronary artery
- 5- Right coronary artery

Answer & Comments

Answer: 5- Right coronary artery

This patient has an inferior myocardial infarction which is usually due to occlusion of the Right Coronary artery and less commonly Circumflex occlusion may be responsible.



[Q: 209] OnExamination - Cardiology

A 60-year-old man with a past history of controlled hypertension presents with acute onset weakness of his left arm, that resolved over 12 hours. He had suffered two similar episodes over the last three months. Examination reveals a blood pressure of 132/82 mmHg and he is in atrial fibrillation with a ventricular rate of 85 per minute. CT brain scan is normal.

What is the most appropriate management?

- 1- amiodarone
- 2- aspirin
- 3- digoxin
- 4- dipyridamole
- 5- warfarin

Answer & Comments

Answer: 5- warfarin

This patient has had three transient ischaemic attacks due to atrial fibrillation. The most appropriate therapeutic strategy for this patient would be warfarin. Studies reveal that warfarin would be therapeutically superior than aspirin in such a patient's case.



[Q: 210] OnExamination - Cardiology

A 65-year-old male is admitted to the coronary care unit with an acute inferior myocardial infarction. There are no contraindications to thrombolysis and he receives streptokinase with good resolution of ECG changes.

Three days later examination is normal, with a blood pressure of 134/76 mmHg. Results

reveal a total cholesterol of 4.8 mmol/L (normal <5.2).

Which one of the following drugs does not have good evidence for reducing future morbidity and mortality?

- 1- Aspirin
- 2- Atenolol
- 3- Simvastatin
- 4- Nifedipine
- 5- Ramipril

Answer & Comments

Answer: 4- Nifedipine

Aspirin leads to a 12% reduced risk of death and 31% reduced risk of reinfarction in evidence reviewed by the Antiplatelet therapy trialists and also GISSI studies. Several trials have demonstrated benefit from long term treatment with beta blockers, by reducing the incidence of recurrent MI, and death from all causes.

Numerous trials have shown benefit from ACE inhibitor therapy post MI in those with and without evidence of left ventricular impairment.

The 4S (Scandinavian Simvastatin Survival Study) demonstrated a benefit from lowering cholesterol with Simvastatin in patients with coronary disease. There is no evidence to support a beneficial effect of nifedipine post MI.



[Q: 211] OnExamination - Cardiology

A 34-year-old male presents with palpitations. The ECG shows a slurred upstroke in the QRS complexes in the chest leads.

What is the treatment of choice?

- 1- Amiodarone
- 2- Aspirin
- 3- Diltiazem

- 4- Radiofrequency ablation
5- Warfarin

Answer & Comments

Answer: 4- Radiofrequency ablation

This patient has Wolff-Parkinson-White syndrome as suggested by the delta wave on ECG. Anticoagulation is not indicated. Risk of arrhythmia after ablation is of the order of 7% over 5 years.



[Q: 212] OnExamination - Cardiology

A 50-year-old man is admitted with cardiogenic shock due to an acute myocardial infarction. His urine output drops over the next few days. His serum urea increases to 18 mmol/L, with creatinine of 300 micromol/L. Urinalysis reveals no protein or glucose, a trace blood, and numerous hyaline casts. Several days later, he develops polyuria and his serum urea and creatinine falls.

Which of the following pathologic findings is most likely to be seen in his kidneys?

- 1- Fusion of podocyte foot processes
- 2- Glomerular crescents
- 3- Hyperplastic arteriosclerosis
- 4- Mesangial immune complex deposition
- 5- Patchy tubular necrosis

Answer & Comments

Answer: 5- Patchy tubular necrosis

He would have findings of ischaemic acute tubular necrosis from cardiogenic shock. Fusion of podocyte foot processes is seen in minimal change glomerulonephritis. Glomerular crescents can complicate any glomerulopathy but, along with mesangial immune complex deposition, is usually an immune-mediated process. Hyperplastic arteriosclerosis is the 'onion skin'

appearance of arterioles in malignant hypertension.



[Q: 213] OnExamination - Cardiology

A 26-year-old professional footballer collapses while playing football. He is rushed to the Accident and Emergency Department, and is found to be in ventricular tachycardia. He is defibrillated successfully and his 12 lead ECG demonstrates normal sinus rhythm, without ST segment changes. Ventricular tachycardia recurs and despite prolonged resuscitation, he dies.

What is the most likely diagnosis?

- 1- Aortic stenosis
- 2- Cocaine intoxication
- 3- Hypertrophic cardiomyopathy
- 4- Myocardial infarction
- 5- Pulmonary embolism

Answer & Comments

Answer: 3- Hypertrophic cardiomyopathy

The history of sudden arrhythmia in a young previously well individual is suggestive of Hypertrophic cardiomyopathy, relatives should be screened for the condition. There is no history to suggest drug abuse, aortic stenosis is rare in the absence of congenital or Rheumatic heart disease. A myocardial infarction and massive pulmonary embolism would have given ECG changes.



[Q: 214] OnExamination - Cardiology

A 40-year-old man attending a routine screening has a blood pressure of 166/100 mmHg. Two weeks later his blood pressure was 150/90 mmHg. He does not smoke. He drinks 35 units alcohol / week. His body mass index (BMI) is 31.5 kg/m² (20 - 25).

What is the best management strategy?

- 1- amlodipine
- 2- atenolol
- 3- bendroflumethiazide
- 4- enalapril
- 5- lifestyle advice

Answer & Comments

Answer: 5- lifestyle advice

This 40-year-old male has Grade 1 obesity as evidenced by his body mass index (Grade 1 = 30-34.9, Grade 2 = 35-39.9 and Grade 3 = > 40). Hypertension in this individual is most likely due to obesity-related hypertension or due to pseudo-cushings syndrome in view of his high alcohol intake and increased BMI. Heightened sympathetic nervous system activity, hyper-insulinemia, insulin resistance, and hyperleptin-emia contribute to obesity-related hypertension.

He needs lifestyle advice about reducing his alcohol intake and a compatible dietary advice to reduce his weight.



[Q: 215] OnExamination - Cardiology

A patient presents with atrial fibrillation and later they revert to sinus rhythm.

Under which of the following circumstances is the patient more likely to remain in sinus rhythm?

- 1- age > 75 years old
- 2- been commenced on warfarin
- 3- left atrium size > 6 cm on ECHO
- 4- short history of AF
- 5- ventricular rate on presentation of 130 bpm

Answer & Comments

Answer: 4- short history of AF

The patient with very recent onset of atrial fibrillation is more likely to stay in sinus rhythm.

Atrial fibrillation in older patients is more likely to be associated with structural heart disease. Anticoagulation should have no effect on the risk of paroxysmal atrial fibrillation. An enlarged left atrium is unlikely to remain in sinus rhythm. Those presenting with a relatively slow ventricular rate and, especially if they are not on betablockers, Calcium antagonists or digoxin, are likely to have chronic atrial fibrillation.



[Q: 216] OnExamination - Cardiology

A 59-year-old male presents with a 1 hour history of central crushing chest pain.. He is known to be diabetic, hypertensive and is a non-smoker. On examination his pulse rate is 90 beats/min, blood pressure 130/85 mmHg, S1 S2 are audible with no murmurs. There is no evidence of cardiac failure. An ECG is performed.

Which of the following would be an indication for thrombolysis?

- 1- Right bundle branch block
- 2- Supraventricular tachycardia
- 3- ST elevation of 2mm in V4-V6
- 4- ST depression of 2mm in leads II,III, avF
- 5- Atrial fibrillation >150min-1

Answer & Comments

Answer: 3- ST elevation of 2mm in V4-V6

This patient is having an acute myocardial infarction, the ECG changes of ST elevation of 2mm in V4-V6 suggest a anterolateral MI. Given this history and ECG changes he should be given thrombolytic treatment. Along with aspirin, heparin, beta blockade, statin therapy and subsequent ACE inhibition. ECG criteria for thrombolysis include ST elevation of >1mm in standard limb leads, ST elevation > 2mm in

anterior chest leads new left bundle branch block, within 24 hours of typical pain. Evidence beyond 12 hours of pain is equivocal thrombolysis at this time tends to be used if there is clinical deterioration or persistent pain.



[Q: 217] OnExamination -
Cardiology

A 50-year-old man with hypertension already on furosemide, ramipril and digoxin is found to poor left ventricular function on echocardiogram.

Which antihypertensive should be added?

- 1- Carvedilol
- 2- Diltiazem
- 3- Doxazosin
- 4- Hydralazine
- 5- Nifedipine

Answer & Comments

Answer: 1- Carvedilol

This patient has hypertension and reduced EF on echo indicating an element of failure. Under these circumstances the most appropriate agent with evidence to support its use for reducing morbidity and mortality in failure would be the addition of a beta blocker.



[Q: 218] OnExamination -
Cardiology

Primary prevention trials for the treatment of hypercholesterolaemia reveal a reduction in all cause mortality following treatment with which of the following?

- 1- Fibrates
- 2- Fish Oils
- 3- Nicotinic acid
- 4- Resins
- 5- Statins

Answer & Comments

Answer: 5- Statins

Primary prevention refers to the prevention of cardiovascular disease in subjects without pre-existent IHD. Although many lipid lowering agents have demonstrated reductions in cardiovascular mortality, the question refers to all cause mortality. WOSCOPS (pravastatin) and AFCAPS-TexCAPS (lovastatin) demonstrated reductions in overall mortality not just cardiovascular mortality following treatment with statins. None of the other agents are proven to reduce all cause mortality in primary prevention. Fibrates are however well proven in secondary prevention trials (BECAIT, VA-HIT).



[Q: 219] OnExamination -
Cardiology

A 17-year-old woman loses consciousness whilst out jogging one afternoon. She has had similar blackouts over the last two to three years which have all occurred during exertion. There is no family history of note. She is taken to Accident and Emergency, where a chest X-ray, CT brain scan, FBC, and biochemistry are all normal. Her ECG shows changes of left ventricular hypertrophy and broad Q waves. An echocardiogram reveals left ventricular and septal hypertrophy, small left ventricle, and reduced septal excursion. The septum has a "ground glass" appearance.

Which of the following conditions is she most likely to have had?

- 1- Diabetes mellitus
- 2- Hypertrophic cardiomyopathy
- 3- Rheumatic heart disease
- 4- Systemic lupus erythematosus
- 5- Viral myocarditis

Answer & Comments

Answer: 2- Hypertrophic cardiomyopathy

The history of collapses in this young woman with echocardiographic features of hypertrophy are highly suggestive of hypertrophic obstructive cardiomyopathy. Hypertrophic cardiomyopathy is defined as the unexplained, asymmetrical or concentric hypertrophy of the undilated left ventricle. There is also hypertrophy of the right ventricle. Incidence is approximately 1 in 500. It is inherited as an autosomal dominant trait but often an inheritance pattern is not found on questioning.



[Q: 220] OnExamination - Cardiology

A 70-year-old woman has a history of dyspnoea and palpitations for six months. An ECG at that time showed atrial fibrillation. She was given digoxin, diuretics and aspirin. She now presents with two short-lived episodes of altered sensation in the left face, left arm and leg. There is poor coordination of the left hand. ECHO was normal as was a CT head scan.

What is the most appropriate next step in management?

- 1- anticoagulation
- 2- carotid endarterectomy
- 3- clopidogrel
- 4- corticosteroid treatment
- 5- no action

Answer & Comments

Answer: 1- anticoagulation

This patient is having symptoms of transient ischaemic attacks most likely due to a cardiac source of emboli. A normal ECHO or CT head does not rule out thrombo-embolic events. There is an increased risk of strokes in patients with atrial fibrillation and hence with the given symptoms formal anticoagulation with warfarin should be considered.



[Q: 221] OnExamination - Cardiology

A 35-year-old lady at 14 weeks gestation is found to have a blood pressure of 160/100 mmHg. Her father's known to have hypertension. Electrocardiogram demonstrates features of left ventricular hypertrophy.

What is the most likely diagnosis?

- 1- Eclampsia
- 2- Essential hypertension
- 3- Pre-eclampsia
- 4- Pregnancy-induced hypertension
- 5- Renal hypertension

Answer & Comments

Answer: 2- Essential hypertension

ECG feature of LVH is the key, telling that her hypertension is not of recent onset, ruling out pregnancy-related causes. Of all causes of hypertension, essential hypertension is the most prevalent. Her family history also supports the diagnosis.



[Q: 222] OnExamination - Cardiology

A 16-year-old male is brought to emergency admissions with alcohol intoxication. An initial ECG reveals atrial fibrillation but a repeat ECG after 12 hours when he has sobered up, shows sinus rhythm. An echocardiogram is normal.

What is the most appropriate management for this patient?

- 1- Aspirin for 3 months
- 2- Bisoprolol for 3 months
- 3- Lifestyle advice
- 4- Sotalol for one month
- 5- Warfarin for one month

Answer & Comments

Answer: 3- Lifestyle advice

Excessive Alcohol is a recognized cause for atrial fibrillation and is the likely cause here as the rhythm has reverted to sinus after 12 hours. There is also no evidence of structural heart disease as the echocardiogram was normal. Therefore this patient needs advice regarding moderation of alcohol consumption and needs to be warned of the toxic effects that alcohol can have on the heart and other organs.

There is no indication for short term aspirin. Atenolol provides rate control, which is not an issue. Sotalol/amiodarone and Flecainide can be used in paroxysmal AF. Short term Warfarin is used for 4-6 weeks prior to elective cardioversion to protect against embolic complications.



[Q: 223] OnExamination - Cardiology

A 60-year-old woman is admitted with sudden onset of chest pain and is diagnosed with an acute myocardial infarction. Her acute illness is complicated by low blood pressure and poor tissue perfusion for several days. Her serum lactate becomes elevated. Her serum urea and creatinine are noted to be increasing.

	Day 1	Day 2	Day 3
urea (mmol/L)	8	22	30
creatinine (mmol/L)	116	140	200

Granular and hyaline casts are present on microscopic urinalysis.

The renal lesion that is most likely to be present in this situation is?

- 1- Acute tubular necrosis
- 2- Minimal change disease
- 3- Nodular glomerulosclerosis
- 4- Pyelonephritis
- 5- Renal vein thrombosis

Answer & Comments

Answer: 1- Acute tubular necrosis

Ischaemia, typically in hypotensive hospitalized patients, is the most frequent antecedent to acute tubular necrosis. Blood pressure should be maintained in cardiogenic shock with fluids and / or inotropic agents.



[Q: 224] OnExamination - Cardiology

A 74-year-old man has had increasingly severe, throbbing headaches for several months, centered on the right. There is a palpable tender cord-like area over his right temple. His heart rate is regular with no murmurs, gallops, or rubs. Pulses are equal and full in all extremities, BP is 110/85 mmHg. A biopsy of this lesion is obtained, and histologic examination reveals a muscular artery with luminal narrowing and medial inflammation with lymphocytes, macrophages, and occasional giant cells. He improves with a course of high-dose corticosteroid therapy.

Which of the following laboratory test findings is most likely to be present with this disease?

- 1- Anti-double stranded DNA titer of 1:1024
- 2- Erythrocyte sedimentation rate of 110 mm/hr
- 3- HDL cholesterol of 0.6 mmol/L
- 4- pANCA titer of 1:160
- 5- Rheumatoid factor titer of 80 IU/mL

Answer & Comments

Answer: 2- Erythrocyte sedimentation rate of 110 mm/hr

These are classic findings for temporal arteritis, the most typical involvement with giant cell arteritis. Corticosteroid therapy typically produces a reduction of symptoms. Not treating this condition puts the patient at risk for involvement of other branches of the external carotid artery, the worst of which would be the ophthalmic branch.



[Q: 225] OnExamination -
Cardiology

A 59-year-old man who was active all his life develops sudden severe anterior chest pain that radiates to his back. Within minutes, he is unconscious. He has a history of hypertension, but a recent treadmill test had revealed no evidence for cardiac disease.

Which of the following is the most likely diagnosis?

- 1- Acute myocardial infarction
- 2- Group A streptococcal infection
- 3- Pulmonary embolus
- 4- Right middle cerebral artery embolus
- 5- Tear in the aortic intima

Answer & Comments

Answer: 5- Tear in the aortic intima

The history is typical of aortic dissection. All the others could cause sudden collapse but not with acute chest pain radiating to the back in the presence of a recent normal exercise test. Acute MI is possible but not the most likely.



[Q: 226] OnExamination -
Cardiology

A 52-year-old male with a five year history of type 2 diabetes is diagnosed with ischaemic heart disease and has recently commenced simvastatin 40mg daily as his cholesterol was 6.2 mmol/l. He re-attends complaining of various muscle aches and pains and you find that his liver function tests are deranged with elevated alkaline phosphatase. You stop the simvastatin and his symptoms subside but his cholesterol remains elevated at 6.3 mmol/l.

Which of the following is the most appropriate strategy to treat his hypercholesterolaemia?

- 1- Bezafibrate
- 2- Ezetimibe

- 3- No treatment required
- 4- Rosuvastatin 10 mg daily
- 5- Simvastatin 20 mg daily

Answer & Comments

Answer: 2- Ezetimibe

This patient has ischaemic heart disease and T2DM and so should be receiving a statin as his cholesterol is also elevated. However, he is intolerant of the statin. Re-introduction of any statin at any dose would have a similar effect and the use of a fibrate may also have a similar side effect profile. Consequently, Ezetimibe would be the most appropriate agent that would be expected to reduce cholesterol concentrations by 25%. It acts to prevent the absorption of cholesterol and is absorbed very little itself so consequently has few side effects.



[Q: 227] OnExamination -
Cardiology

A 52-year-old male attends a well man clinic. On review of his history he has a strong family history of ischaemic heart disease and is a smoker of 10 cigarettes per day and drinks approximately 20 units of alcohol per week. On examination, he is obese with a BMI of 32 kg/m² and has a blood pressure of 152/88 mmHg. His investigations reveal that he has a fasting plasma glucose of 10.5 mmol/l, HbA1c of 7.8% and his cholesterol concentration is 5.5 mmol/l.

Which of the following would be expected to be most effective in reducing his cardiovascular risk?

- 1- Improve glycaemic control with Metformin
- 2- Improve hypertensive control with Ramipril
- 3- Reduce cholesterol with Simvastatin
- 4- Stop smoking
- 5- Weight loss with Xenical

Answer & Comments

Answer: 4- Stop smoking

This patient has hypertension and is diabetic as suggested by the elevated fasting plasma glucose. Although metformin has been shown to reduce CV mortality in obese diabetics (UKPDS), ramipril reduces CV risk in hypertensive diabetics (HOPE) and statins reduce CV mortality (4S, HPS), none of these interventions are as effective as stopping smoking in reducing CV risk. There is no evidence that weight loss per se reduces CV mortality, possibly because the studies haven't been done.



[Q: 228] OnExamination - Cardiology

A 55-year-old male attends for an insurance medical review. He has a family history of ischaemic heart disease and has been feeling tired of late.

Investigations reveal:

Total Cholesterol 6.8 mmol/l

HDL cholesterol 0.9 mmol/l

Triglycerides 2.2 mmol/l

Free Thyroxine 10 mmol/l (9-22)

TSH 22.5 mu/l (0.5-5)

What is the most appropriate treatment for this man's dyslipidaemia?

- 1- Atorvastatin
- 2- Ezetimibe
- 3- Gemfibrozil
- 4- 3-Omega fish oils
- 5- Thyroxine

Answer & Comments

Answer: 5- Thyroxine

This man has subclinical hypothyroidism with a normal T4 but elevated TSH. Thyroid hormone is known to play a role in regulating

the synthesis, metabolism, and mobilization of lipids. It is recognised that the lipid abnormalities tend to resolve following treatment with thyroxine.



[Q: 229] OnExamination - Cardiology

A new antihypertensive drug needs to be investigated to establish its relative potency.

Which of the following techniques is most appropriate for this purpose?

- 1- bioassay
- 2- case-control study
- 3- double-blind, randomized, placebo controlled study
- 4- postmarketing surveillance
- 5- sequential trial

Answer & Comments

Answer: 1- bioassay

Biological assays are designed to measure the relative potency of different preparations. Blood pressure is highly variable and is subject to variability because of the patient's level of anxiety and the method used by the observer to measure it. In a test of EFFICACY of an antihypertensive drug, a double-blind, randomized design would be favourable. A sequential trial (a trial in which the data are analysed after each participant's results become available, and the trial continues until a clear benefit is seen in one of the comparison groups) could also be used to assess efficacy, but there would have to be a large expected difference from placebo.



[Q: 230] OnExamination - Cardiology

A 40-year-old male with type 2 diabetes has difficulty to control hypertension. He is currently being treated with atenolol, amlodipine and Ramipril but his blood

pressure remains consistently above 170/100. Examination reveals grade II hypertensive retinopathy.

His investigations reveal:

Sodium 144 mmol/l

Potassium 3.1 mmol/l

Urea 5.5 mmol/l

Creatinine 100 micromol/l

Glucose 7.9 mmol/l

HbA1c 7%

ECG left ventricular hypertrophy

Which diagnosis should be considered as a cause of his resistant hypertension?

- 1- Conn's syndrome (primary hyperaldosteronism)
- 2- Cushing's syndrome
- 3- Pheochromocytoma
- 4- Primary hyperparathyroidism
- 5- Renal artery stenosis

Answer & Comments

Answer: 1- Conn's syndrome (primary hyperaldosteronism)

This patient has a low potassium concentration and resistant hypertension despite being on an ACEi that should produce an elevation of his potassium concentration. Primary hyperaldosteronism may be due to an adrenal adenoma (Conn's) or bilateral adrenal hyperplasia. The low potassium concentration is highly suggestive. It may be diagnosed based on an elevated renin:aldosterone ratio (usually above 1000).



[Q: 231] OnExamination - Cardiology

A 70-year-old man was referred by his GP with difficult to treat hypertension. He had long-standing hypertension which had been well controlled over many years but recently he

was found to have a blood pressure of 190/110 mmHg which proved resistant to additional treatment. He was generally asymptomatic and complied with medication. Investigations showed normal U+Es.

Which one of the following is the most likely cause?

- 1- Chronic pyelonephritis
- 2- Conn's syndrome (primary hyperaldosteronism)
- 3- Pheochromocytoma
- 4- Polycystic kidney disease
- 5- Renovascular disease

Answer & Comments

Answer: 5- Renovascular disease

Primary hyperaldosteronism (Conn's syndrome) typically have hypokalaemic alkalosis. One should also suspect Conn's with patients resistant to conventional antihypertensive treatment and with the electrolytes in the direction of Conn's without necessarily being outside the normal range (plasma Na > 140 and K < 4).

However, in this patient's case he has long standing hypertension but has deteriorated. Therefore the most likely cause is renovascular disease related to his hypertension.



[Q: 232] OnExamination - Cardiology

A 48-year-old female with a three year history of type 2 diabetes presents at annual review. Despite optimisation of her oral hypoglycaemic therapy she has gained approximately 5 kg in weight over the last year and her HbA1c has deteriorated. She is also treated with Ramipril, Bendroflumethiazide, Amlodipine but her blood pressure remains difficult to control with a recording of 172/102 mmHg. On examination, she has developed abdominal

striae, thin skin is noticeable with bruising and she also has a proximal weakness. A diagnosis of Cushing's syndrome is suspected.

What is the most appropriate investigation for this patient?

- 1- 9 am ACTH concentration
- 2- 9 am cortisol concentration
- 3- 24 hour urine free cortisol concentration
- 4- Chest X-ray
- 5- CT scan adrenals

Answer & Comments

Answer: 3- 24 hour urine free cortisol concentration

Explanation: Appropriate screening tests for Cushing's syndrome include a 1mg overnight dexamethasone suppression test (1mg dexamethasone given at 11pm and the cortisol measured at 9am the following morning). A cortisol concentration less than 50nmol/l after this test would be regarded as normal. Another equally good and easy to perform test is a 24hr urine collection measuring free cortisol in the urine. An elevated cortisol (usually above 250 nmol/day) suggests Cushing's syndrome. Random cortisol or 9am cortisol provides no diagnostic information whatsoever. Chest X-ray and CT adrenals are useful in investigating the possible cause of Cushing's syndrome.



[Q: 233] OnExamination - Cardiology

A 63-year-old male is being reviewed for hypertension associated with type 2 diabetes. Currently he receives aspirin 75mg daily, atenolol 50 mg daily and atorvastatin 20 mg daily. His blood pressure is consistently around 160/92 mmHg.

What antihypertensive therapy would you add to improve this patient's hypertensive control?

- 1- Alpha-methyl dopa

- 2- Bendrofulazide
- 3- Doxazosin
- 4- Moxonidine
- 5- Ramipril

Answer & Comments

Answer: 5- Ramipril

This patient has inadequately controlled hypertension but appears to be tolerating his current therapy well. This chap with T2DM should be on ACE inhibitor, which is the antihypertensive of choice in Diabetes.



[Q: 234] OnExamination - Cardiology

A 24-year-old girl with Down syndrome is found to have a systolic murmur on clinical examination.

What is the most common cardiac defect seen in patients with Down syndrome that may explain this murmur?

- 1- Endocardial cushion defect
- 2- Mitral regurgitation
- 3- Patent ductus arteriosus
- 4- Secundum atrial septal defect
- 5- Ventricular septal defect

Answer & Comments

Answer: 1- Endocardial cushion defect

Endocardial cushion defects, more commonly known as atrioventricular (AV) canal or septal defects, include a range of defects characterized by involvement of the atrial septum, the ventricular septum, and one or both of the AV valves.



[Q: 235] OnExamination - Cardiology

A 65-year-old man has been stable on the general medical ward following an admission

with acute coronary syndrome several days previously. His drug history consists of aspirin, enalapril and GTN spray. He has developed dyspnoea over the last few hours. On examination he has a raised JVP and crackles to his mid zones. His ECG shows a rate of 140 bpm in atrial fibrillation.

Which of the following is the most appropriate management?

- 1- IV amiodarone
- 2- IV digoxin
- 3- IV flecainide
- 4- Observe and screen for MI
- 5- Synchronised DC cardioversion

Answer & Comments

Answer: 5- Synchronised DC cardioversion

It is sometimes difficult to assess if the atrial fibrillation is a cause or a consequence of the heart failure in such a patient but the clinical history suggests that the AF has triggered the symptoms of LVF. The best approach is therefore to quickly to relieve the atrial fibrillation with cardioversion. This may not be possible in which case a pharmacological approach may be tried.



[Q: 236] OnExamination - Cardiology

A 48-year-old man presents with acute coronary syndrome. On examination he has palmar crease xanthoma.

Which of the following is the most likely diagnosis of his lipid abnormalities?

- 1- Familial combined hyperlipidaemia
- 2- Familial hypercholesterolaemia
- 3- Familial hypertriglyceridaemia
- 4- Lipoprotein lipase deficiency
- 5- Remnant hyperlipidaemia

Answer & Comments

Answer: 5- Remnant hyperlipidaemia

Palmar crease xanthoma are associated with remnant hyperlipidaemia (Type III hyperlipidaemia).



[Q: 237] OnExamination - Cardiology

A 50-year-old woman is found to have reversed splitting of the second heart sound.

This is found in which one of the following conditions?

- 1- Atrial septal defect
- 2- Mild aortic regurgitation
- 3- Patent ductus arteriosus
- 4- Right bundle branch block (RBBB)
- 5- Ventricular septal defect (VSD)

Answer & Comments

Answer: 3- Patent ductus arteriosus

Reversed splitting of the 2nd heart sound occurs with reversal of the normal A2,P2 pattern. Thus A2 may be delayed as with severe AS (not mild), and LBBB. P2 may be early as with Wolff-Parkinson-White type B and Persistent Ductus Arteriosus. Atrial septal defects show wide fixed splitting, and RBBB has wide, but not fixed splitting.



[Q: 238] OnExamination - Cardiology

A 45-year-old man presents with a rash. On examination you find he has eruptive xanthoma.

Which of the following is the most likely diagnosis?

- 1- Familial combined hyperlipidaemia
- 2- Familial hypercholesterolaemia
- 3- Familial hypertriglyceridaemia

- 4- Hyperlipidaemia associated with nephrotic syndrome
- 5- Remnant hyperlipidaemia

Answer & Comments

Answer: 3- Familial hypertriglyceridaemia

Eruptive xanthoma occur in a number of types of hypertriglyceridaemia and also in uncontrolled diabetes mellitus. Of those listed the most likely is familial hypertriglyceridaemia.



[Q: 239] OnExamination - Cardiology

A 55-year-old man presented to the Emergency department with sudden breathlessness. He is sweaty and obviously short of breath. He is a smoker with a past history of hypertension. There are crackles on inspiration at both his lung bases and his CXR shows upper lobe venous diversion and perihilar shadowing.

His ECG shows sinus tachycardia only and his cardiac enzymes, when they return the next day, are normal. His symptoms resolved quickly with oxygen and furosemide.

Which of the following conditions is the most likely explanation of this presentation?

- 1- Hypertrophic obstructive cardiomyopathy
- 2- Myocardial infarction
- 3- Pheochromocytoma
- 4- Pulmonary embolism
- 5- Renal artery stenosis

Answer & Comments

Answer: 5- Renal artery stenosis

Flash pulmonary oedema in someone with a history of hypertension, especially those suspected of being arteriopathies such as smokers, should raise the possibility of renal artery stenosis.



[Q: 240] OnExamination - Cardiology

On physical examination a 65-year-old man is found to have pulsus alternans where there is regular alternation of the force of his radial pulse.

Which of the following conditions is the most likely diagnosis?

- 1- Aortic stenosis
- 2- Cardiac tamponade
- 3- Hypertrophic obstructive cardiomyopathy
- 4- Mixed aortic valve disease
- 5- Severe left ventricular failure

Answer & Comments

Answer: 5- Severe left ventricular failure

Pulsus alternans is a physical finding characterized by a regular alternation of the force of the arterial pulse. It almost invariably indicates the presence of severe left ventricular systolic dysfunction.



[Q: 241] OnExamination - Cardiology

A 60-year-old woman has a systolic murmur. As part of the evaluation you listen to the murmur during a Valsalva manoeuvre and the murmur becomes louder.

Which of the following systolic murmurs becomes louder with a Valsalva?

- 1- Aortic stenosis
- 2- Hypertrophic obstructive cardiomyopathy
- 3- Mitral flow murmur
- 4- Mitral regurgitation
- 5- Ventricular septal defect

Answer & Comments

Answer: 2- Hypertrophic obstructive cardiomyopathy

Most murmurs of stenosis or regurgitation are exaggerated during squatting and get softer with the Valsalva manoeuvre. The exceptions are HOCM where the opposite occurs and mitral valve prolapse where the murmur gets longer.



[Q: 242] OnExamination - Cardiology

A 60-year-old man presents with features of left ventricular failure. He is comfortable at rest but ordinary physical activity results in fatigue and shortness of breath.

Which of the following New York Heart Association's classifications best match the severity of this man's disease?

- 1- Normal
- 2- NYHA Class I
- 3- NYHA Class II
- 4- NYHA Class III
- 5- NYHA Class IV

Answer & Comments

Answer: 3- NYHA Class II

In 1928 the New York Heart Association published a classification of patients with cardiac disease based on clinical severity and prognosis. This classification has been updated in seven subsequent editions of Nomenclature and Criteria for Diagnosis of Diseases of the Heart and Great Vessels (Little, Brown & Co.). The ninth edition, revised by the Criteria Committee of the American Heart Association, New York City Affiliate, was released March 4, 1994.

"Class II. Patients with cardiac disease resulting in slight limitation of physical activity. They are comfortable at rest. Ordinary physical activity results in fatigue, palpitation, dyspnea or anginal pain."



[Q: 243] OnExamination - Cardiology

Closure of the tricuspid valve is marked by which of the following features of the jugular venous waveform?

- 1- a wave
- 2- c wave
- 3- v wave
- 4- x descent
- 5- y descent

Answer & Comments

Answer: 2- c wave

The c wave of the jugular venous waveform is associated with the closure of the tricuspid valve.



[Q: 244] OnExamination - Cardiology

A 60-year-old woman with ischaemic heart disease is seen for review. She reports that she has developed symmetrical muscle aches and pains and you attribute this to a myalgia associated with simvastatin. Her Creatinine kinase is within the normal range.

However, her dyslipidaemia management is still sub-optimal and you wish to add in a further agent.

Total Cholesterol 5.5 mmol/L

LDL Cholesterol 3.8 mmol/L

HDL Cholesterol 1.3 mmol/L

Triglycerides 1.4 mmol/L

You plan to continue the statin treatment.

Which of the following agents would be the most appropriate additional therapy for this patient?

- 1- Chloestyramine
- 2- Ezetimibe
- 3- Gemfibrozil

- 4- Nicotinic acid
- 5- Omega-3 fatty acids

Answer & Comments

Answer: 2- Ezetimibe

This patient presents with a probable statin induced myalgia which often improves with time. Sometimes stopping therapy briefly or re-introducing a different statin may resolve the myalgia. Statin induced myositis is relatively uncommon occurring in approximately 0.1-0.2%. But, the risk of myositis and the potentially fatal rhabdomyolysis is increased with Gemfibrozil, in prone subjects in combination with a statin and as such should be avoided. Additional agents could include Omega-3 fatty acids and Ezetimibe. Nicotinic acid is less used due to problems with flushing though can be useful particularly in hypertriglyceridaemia. Cholestyramine can also be used. In this case it is the LDL cholesterol that needs to be targeted and ezetimibe would be the most appropriate choice.



[Q: 245] OnExamination - Cardiology

A 58-year-old man with a history of schizophrenia on thioridazine is found to have episodes of Torsades de Pointes ventricular tachycardia. His blood pressure is 110/70.

Which of the following is the most appropriate management?

- 1- IV betablocker
- 2- IV lidocaine
- 3- IV magnesium
- 4- Overdrive pacing
- 5- Synchronised DC cardioversion

Answer & Comments

Answer: 3- IV magnesium

Thioridazine, an antipsychotic, and many other drugs can prolong the QT interval and increase the risk of Torsade de Pointes VT. Self limiting bursts of Torsade may be seen on an ECG and prompt urgent treatment.



[Q: 246] OnExamination - Cardiology

On physical examination of a 42-year-old man you find a 'jerky' pulse.

Which of the following conditions is most associated with a 'jerky' pulse?

- 1- Aortic stenosis
- 2- Cardiac tamponade
- 3- Hypertrophic obstructive cardiomyopathy
- 4- 'Mixed' aortic valve disease
- 5- Severe left ventricular failure

Answer & Comments

Answer: 3- Hypertrophic obstructive cardiomyopathy

Hypertrophic Obstructive Cardiomyopathy (HOCM) is typically associated with a jerky pulse although it may present with entirely normal clinical findings.



[Q: 247] OnExamination - Cardiology

A 65-year-old man has an ejection systolic murmur and narrow pulse pressure on clinical examination. There is no history of chest pain, breathlessness or syncope. An ECHO confirms aortic stenosis and shows an aortic valve gradient of 40 mmHg. There is good left ventricular function.

Which of the following management options is the most appropriate choice in this case?

- 1- Anticoagulation
- 2- Aortic valvuloplasty
- 3- Cardiology outpatient review
- 4- Routine aortic valve replacement

5- Urgent aortic valve replacement

Answer & Comments

Answer: 3- Cardiology outpatient review

Indications for surgery in aortic stenosis include a gradient of 50 mmHg or more, or associated symptoms such as syncope, breathlessness and episodes of pulmonary oedema. This patient should be monitored in cardiology clinic so that a decision on the timing of valve surgery can be made.



[Q: 248] OnExamination -
Cardiology

On auscultation of a patient's heart you hear a 'pan-systolic murmur'.

With which of the following conditions is this murmur associated?

- 1- Aortic regurgitation
- 2- Coarctation of the aorta
- 3- Mitral stenosis
- 4- Pulmonary stenosis
- 5- Ventricular septal defect

Answer & Comments

Answer: 5- Ventricular septal defect

A pansystolic or holosystolic murmur extends from the 1st heart sound through to the 2nd heart sound which is often hard to hear because of the murmur. It is seen in septal defects and, more commonly, mitral regurgitation.



[Q: 249] OnExamination - Basic Science

Which of the following statement regarding the internal jugular vein and relations is true?

- 1- Originates at the sphenoid sinus
- 2- Lies medial to the common carotid artery
- 3- Passes posterior to the internal carotid artery
- 4- On the right side crosses the first part of the subclavian artery
- 5- The right internal jugular is usually smaller than the left

Answer & Comments

Answer: 4- On the right side crosses the first part of the subclavian artery

The anatomy of the jugular vein is important given that it is the site of insertion of central venous catheters. The internal jugular vein originates at the Jugular foramen. It initially lies posterior and lateral to the carotid artery. As it descends in the carotid sheath it lies lateral first to the internal then the common carotid artery within the carotid sheath. It passes anterior to the subclavian artery to join the subclavian vein to form the innominate vein. The internal jugular vein receives a lymphatic trunk at its union with the subclavian vein. The internal jugular vein is usually of considerable size, and the right internal jugular is usually larger than the left. The external jugular vein drains into the subclavian vein.



[Q: 250] OnExamination - Basic Science

During a neurological examination of the upper limb you attempt to elicit the 'triceps reflex.' You place the patient's arm across the chest, with the elbow flexed at 90°. The triceps tendon is struck with the tendon hammer.

Which nerve (and its nerve root) are you testing?

- 1- Median nerve C6
- 2- Median nerve C7
- 3- Radial nerve C5
- 4- Radial nerve C6
- 5- Radial nerve C7

Answer & Comments

Answer: 5- Radial nerve C7

The radial nerve innervates the triceps muscle, it is primarily derived from the C7 nerve root. The radial nerve is the motor supply to the extensor compartments of the upper limb. The triceps muscle is the chief extensor of the forearm. Its name derives from its three heads of origin (long, lateral and medial). It attaches into the olecranon of the ulna.



[Q: 251] OnExamination - Basic Science

Which of the following organs is in direct contact with the anterior surface of the left kidney, without being separated from it by visceral peritoneum?

- 1- Duodenum
- 2- Jejunum
- 3- Pancreas
- 4- Spleen
- 5- Stomach

Answer & Comments

Answer: 3- Pancreas

The spleen and stomach, though in contact are covered in omentum. The pancreas is retroperitoneal.

[Q: 252] OnExamination - Basic Science

A 35-year-old male is struck on the lateral aspect of his right knee by the bumper of a car travelling at low velocity. On examination he is unable to dorsiflex the ankle, evert the foot

and extend the toes. There is loss of sensation of the dorsum of the foot.

He is most likely to have damaged which structure?

- 1- Common peroneal nerve
- 2- Deep peroneal nerve
- 3- Saphenous nerve
- 4- Sural nerve
- 5- Tibial nerve

Answer & Comments

Answer: 1- Common peroneal nerve

The common peroneal nerve supplies the muscles of the peroneal and anterior compartment of the leg and sensation to the dorsum of the foot. The deep peroneal nerve is a division of the common peroneal nerve and supplies only the muscles of the anterior compartment of the leg.



[Q: 253] OnExamination - Basic Science

Which one of the following biochemical abnormalities would fit with a diagnosis of Bartter's syndrome?

- 1- Hyperchloraemia
- 2- Hyperkalemia
- 3- Hypernatraemia
- 4- Hyperphosphataemia
- 5- Hypokalemia

Answer & Comments

Answer: 5- Hypokalemia

Bartter's syndrome is a condition of excessive renal potassium loss associated with normotension.



[Q: 254] OnExamination - Basic Science

Leukotrienes:

- 1- Are formed from the cyclooxygenase pathway
- 2- Are synthesized by fibroblasts
- 3- Decrease vascular permeability
- 4- Leukotriene D4 has been identified as SRS-A which causes bronchial wall smooth muscle relaxation
- 5- Stimulate mucus secretion

Answer & Comments

Answer: 5- Stimulate mucus secretion

Leukotrienes are synthesized by leucocytes. They are mediators of allergic reaction. They increase vascular permeability and attract neutrophils and eosinophils to inflammatory sites. Leukotrienes are synthesised via the lipoxygenase pathway. Leukotriene D4 has been identified as SRS-A which causes bronchial wall and intestinal smooth muscle contraction (not dilatation). Leukotrienes also stimulate mucus production, an important consideration in the pathophysiology of bronchial asthma.



[Q: 255] OnExamination - Basic Science

A 43-year-old female presents with weight gain and menstrual irregularities. Her BMI is 29 kg/m², blood pressure is 150/90 mmHg and Urinalysis shows + glucose.

Which of the following investigations is most likely to confirm the diagnosis?

- 1- 24 hour urine cortisol
- 2- Aldosterone
- 3- HbA1c
- 4- Prolactin
- 5- Plasma testosterone

Answer & Comments

Answer: 1- 24 hour urine cortisol

The diagnosis here may be Cushing's syndrome. This is supported by the weight gain, high BMI, hypertension, menstrual irregularities and glycosuria. There is a possibility that this vignette describes PCOS, but a single testosterone reading would add little information to the suspected diagnosis. However raised urinary cortisol is a relatively sensitive marker of Cushing's. A random aldosterone level tells you little, and an HbA1c is not an accepted screening tool, even for diabetes. The history does not suggest prolactinoma, which may present with vague symptomatology, galactorrhoea and menstrual irregularities.



[Q: 256] OnExamination - Basic Science

Which of the following is most likely be associated with hyperkalaemia?

- 1- Cushing's syndrome
- 2- Beta adrenergic stimulation
- 3- Mannitol
- 4- Cyclosporin
- 5- Bartter's syndrome

Answer & Comments

Answer: 4- Cyclosporin

Common causes of hyperkalaemia include 1. Impaired renal excretion: renal failure, hyporeninaemic hypoaldosteronism (type IV renal tubular acidosis), Addison's, C-21 hydroxylase deficiency. 2. Cellular changes: acidosis, rhabdomyolysis, tumour lysis, malignant hyperthermia, burns. 3. Drugs: potassium retaining diuretics, ACE inhibitors, NSAIDs, cyclosporin, succinyl choline, β -blockers.



[Q: 257] OnExamination - Basic Science

An Afro-Caribbean male aged 48 years presents with gradual onset of exertional dyspnoea, non productive cough, malaise, weight loss and polyarthralgia. Schirmers test indicates a dry eye. X-ray of the hand shows punched out osteopenic lesions.

Which of the following investigation is unlikely to be helpful in establishing the diagnosis of this condition:

- 1- Serum calcium
- 2- Serum phosphorus
- 3- Urea and electrolytes
- 4- Thallium Scan
- 5- Quantitative Immunoglobulins.

Answer & Comments

Answer: 4- Thallium Scan

This condition is sarcoidosis. Serum calcium, Serum phosphorus, Chem7 and Chem 20 and Quantitative Immunoglobulins are all used in establishing the diagnosis. Gallium scan is helpful in sarcoidosis.

Gallium scan vs. Thallium scan.

Gallium scan (radioactive ^{67}Ga) is used to detect inflammation - such as in inflammatory disorders or malignancy.

Thallium (radioactive ^{201}Tl) is a potassium analogue and is used to demonstrate areas of poor perfusion. It is particularly used in cardiology to detect areas of ischaemia.



[Q: 258] OnExamination - Basic Science

Metabolic alkalosis is characteristically found in which of the following?

- 1- An infusion of sodium chloride
- 2- Ileostomy
- 3- Mineralocorticoid deficiency

4- Pyloric stenosis

5- Salicylate poisoning

Answer & Comments

Answer: 4- Pyloric stenosis

Pyloric stenosis is associated with vomiting and the loss of stomach content ?hence a metabolic alkalosis. Mineralocorticoid excess (Conn's syndrome) is also associated with a metabolic alkalosis. Ileostomy may be associated with a loss of bicarbonate ions and hence acidosis. Salicylates are themselves acidic and produce a metabolic acidosis. Normal saline has a pH of 5 and may produce a mild metabolic acidosis with significant infusions.



[Q: 259] OnExamination - Basic Science

A 65-year-old man with a past history of myocardial infarction 4 years earlier was admitted with sudden onset shortness of breath, decreasing exercise tolerance and pedal oedema. He takes lansoprazole, aspirin, furosemide and lisinopril.

Which of the following laboratory test would identify the reason for his acute presentation?

- 1- Brain natriuretic peptide
- 2- Clotting screen
- 3- C-reactive protein
- 4- Full blood count
- 5- Urea and electrolytes

Answer & Comments

Answer: 1- Brain natriuretic peptide

This patient has features of heart failure which appear to be related to underlying ischaemic heart disease. BNP, is synthesized in the cardiac ventricles and correlates with LV pressure, degree of dyspnoea, and state of neurohormonal modulation. Thus BNP is the

first potential marker for heart failure. Measurement of plasma BNP concentration is evolving as a very efficient and cost effective mass screening technique for identifying patients with various cardiac abnormalities regardless of etiology and degree of LV systolic dysfunction.



[Q: 260] OnExamination - Basic Science

A 75-year-old man presents with a long history of shortness of breath and ankle oedema. His serum biochemistry shows sodium 122 mmols/l and potassium of 2.9 mmols/l. He now complains of weakness.

Which of the following is likely to explain the above biochemical picture?

- 1- Addison's Disease
- 2- Nephrotic syndrome
- 3- Primary hyperaldosteronism
- 4- SIADH
- 5- Diuretic therapy

Answer & Comments

Answer: 5- Diuretic therapy

The long history of his symptoms and serum biochemistry suggests that his condition is due to treatment with furosemide for CCF.



[Q: 261] OnExamination - Basic Science

Lipoprotein lipase deficiency is associated with:

- 1- Abetalipoproteinaemia
- 2- Combined hyperlipidaemia
- 3- Familial combined hyperlipidaemia
- 4- Familial Hypercholesterolaemia
- 5- Marked Hypertriglyceridaemia

Answer & Comments

Answer: 5- Marked Hypertriglyceridaemia

Lipoprotein lipase deficiency is autosomal recessive and associated with increased chylomicrons and marked hypertriglyceridaemia.



[Q: 262] OnExamination - Basic Science

Which of the following stimulate the generation of cyclic AMP as the second messenger?

- 1- Nitric Oxide
- 2- Rosiglitazone
- 3- Tissue Necrosis Factor (TNF) alpha
- 4- Cholera toxin
- 5- Growth hormone

Answer & Comments

Answer: 4- Cholera toxin

Nitric oxide generates cGMP as the second message and rosiglitazone acts through agonism of PPAR gamma. Calcitonin Cholera toxin binds to the Ganglioside receptors and causes excessive production of cAMP which leads to the activation of luminal sodium pumps and the secretory diarrhoea.. GH like TNF alpha acts on the GH/cytokine superfamily of receptor which function via the JAK-STAT pathway.



[Q: 263] OnExamination - Basic Science

Which of the following statements is true concerning gamma glutamyl transferase?

- 1- Increased GGT is found in fatty liver
- 2- Isolated elevation of gamma GT in a patient with prostatic carcinoma Indicates the presence of hepatic metastases.
- 3- It is a better indicator of infectious hepatitis than of cholestasis

4- It is only present in the liver

5- Serum activity is typically elevated in pregnancy

Answer & Comments

Answer: 1- Increased GGT is found in fatty liver

GGT found in muscle, prostate as well as liver. Increased levels of GGT are found in cholestatic liver disease and in hepatocellular disease when there is an element of cholestasis. Levels are increased with chronic intake of excess alcohol and with certain drugs (esp phenytoin), as a result of enzyme induction. Pancreatitis and prostatitis may also be associated with increased levels. Levels may be normal early in the course of acute hepatocellular damage eg acute viral hepatitis, paracetamol hepatotoxicity. Elevations in pregnancy would suggest liver disease.



[Q: 264] OnExamination - Basic Science

A 72-year-old man is found to have the following biochemistry:

calcium 1.98 mmol/l (2.2-2.6)

phosphate 0.55 mmol/l (0.8-1.5)

alkaline phosphatase 450 IU/l (50-110)

Which of the following is the most likely explanation for his biochemistry?

- 1- Osteoporosis
- 2- Osteomalacia
- 3- Pagets Disease
- 4- Tertiary Hyperparathyroidism
- 5- Renal failure

Answer & Comments

Answer: 2- Osteomalacia

Osteomalacia is associated with low calcium and phosphate with raised alkaline phosphatase. Serum biochemistry is normal in osteoporosis. Paget's disease is associated with normal calcium and phosphate with raised alkaline phosphatase. In renal failure when tertiary hyperparathyroidism sets in there is low calcium with raised phosphate. Similarly phosphate tends to be high in secondary hyperparathyroidism.



[Q: 265] OnExamination - Basic Science

A new treatment for osteoarthritis has been developed and shown to be effective in animal models plus its effects in small numbers of patients appears promising. However, there are some concerns with regard to possible hepatotoxicity but no cases have been observed in studies thus far.

Which is the most appropriate next step in this drug's development?

- 1- case control study
- 2- double blind randomised placebo controlled study
- 3- Drug development should be suspended due to the hepatotoxicity
- 4- open label study
- 5- single blind randomised placebo controlled study

Answer & Comments

Answer: 2- double blind randomised placebo controlled study

This drug has completed animal trials and has been tested in human volunteers (phase 1) and has also been tried in patients (phase 2). Thus the next stage in its development is a phase 3 study and the best phase 3 study would be a Randomised control study.



[Q: 266] OnExamination - Basic Science

What is a likely explanation for the high prevalence of cystic fibrosis in European populations?

- 1- Most of the disease genes are hidden in heterozygotes.
- 2- The locus has a high mutation rate.
- 3- Many different mutations can cause cystic fibrosis.
- 4- Inbreeding is common among Europeans.
- 5- Heterozygotes may have an advantage because of increased resistance to cholera.

Answer & Comments

Answer: 5- Heterozygotes may have an advantage because of increased resistance to cholera.

The prevalence of the cystic fibrosis gene at around 1 in 20 of the population would suggest that this provides some evolutionary survival advantage. Like sickle cell trait offering a survival advantage to malaria, it is believed that the cystic fibrosis gene offers a possible survival advantage against cholera and enteropathogenic bacteria.

"Cholera opens chloride channels, letting chloride and water leave cells. The CFTR protein does just the opposite, closing chloride channels and trapping salt and water in cells, which dries out mucus and other secretions. A person with CF cannot contract cholera, because the toxin cannot open the chloride channels in the small intestine.

Carriers of CF enjoy the mixed blessing of a balanced polymorphism. They do not have enough abnormal chloride channels to cause the labored breathing and clogged pancreas of cystic fibrosis, but they do have enough of a defect to prevent the cholera from taking hold. During the devastating cholera epidemics that have peppered history, individuals carrying mutant CF alleles had a

selective advantage, and they disproportionately transmitted those alleles to future generations. However, because CF arose in Western Europe and cholera in Africa, perhaps an initial increase in CF heterozygosity was a response to a different diarrheal infection."



[Q: 267] OnExamination - Basic Science

Which of the following is typically elevated in Gauchers disease?

- 1- Acid phosphatase
- 2- Alkaline phosphatase
- 3- Amylase
- 4- Glucocerebrosidase
- 5- Lipase

Answer & Comments

Answer: 1- Acid phosphatase

Gaucher's disease is the most frequent of the lysosomal storage diseases. The condition is usually due to a catalytic deficiency of glucocerebrosidase. It is accompanied by many ill-understood plasma and metabolic abnormalities. These include a polyclonal immunoglobulin response that may progress to monoclonal gammopathy, amyloidosis, or even frank myeloma. Low-density lipoprotein (LDL) and high-density lipoprotein (HDL) cholesterol fractions are abnormal in the plasma. Some lysosomal enzymes are elevated, including tartrate-resistant acid phosphatase, hexosaminidase, and a human chitinase, chitotriosidase. This latter enzyme has proved to be very useful for monitoring Gaucher's disease activity in response to treatment, and may reflect the severity of the disease.



[Q: 268] OnExamination - Basic Science

Where does RNA splicing occur?

- 1- cytoplasm
- 2- endoplasmic reticulum
- 3- mitochondria
- 4- nucleus
- 5- ribosome

Answer & Comments

Answer: 4- nucleus

Coding sequence is interrupted by non-coding sequences. Removal of the introns in RNA transcript modification is called RNA splicing. Splicing occurs in the nucleus before transport to the cytoplasm. Exons are expressed sequences: these sequences are those present in mature mRNA.



[Q: 269] OnExamination - Basic Science

In meiosis which of the following is true?

- 1- DNA replication occurs during meiosis 1.
- 2- At the beginning of meiosis 2, each cell contains 23 single chromosomes.
- 3- Anaphase lag results in one of the 2 daughter cells receiving an extra part of one chromosome.
- 4- Non-disjunction at mitosis (meiosis 2) results in mosaicism.
- 5- The incidence of Down's Syndrome due to translocation increases with increasing maternal age.

Answer & Comments

Answer: 4- Non-disjunction at mitosis (meiosis 2) results in mosaicism.

Meiosis is the form of cell division that produces gametes. It is divided into 2 parts meiosis 1 and meiosis 2. DNA replication occurs before meiosis 1, and the cell begins division with twice the normal cellular amount of DNA.

In meiosis 1, each daughter cell gets one of the duplicated chromosomes of each pair. At the beginning of meiosis 2, each cell contains 23 chromosomes each with a duplicated pair of chromatids.

In meiosis 2, the duplicated pair separate and each daughter cell ends up with one of each of the 23 chromosomes (4 haploid daughter cells). Two common areas of cell division occurring during meiosis are non-disjunction (2 chromosomes fail to separate, so both copies of the chromosome go to one of the daughter cells); and anaphase lag in which a chromatid is lost because it fails to move quickly enough during anaphase to become incorporated into one of the new daughter cells.

In Down's Syndrome, non-disjunction accounts for 94% of cases. The incidence of this increases with increasing maternal age. 5% of cases are due to translocation, and 1% to mosaicism.



[Q: 270] OnExamination - Basic Science

Which of the following is true of autosomal dominant breast cancer?

- 1- It is characterized by loss of heterogeneity
- 2- It accounts for nearly half of all breast cancer cases in the United States
- 3- It can be detected by hybridization with a single oligonucleotide probe
- 4- Penetrance is close to 100%, with nearly all gene carriers developing breast cancer by age 80
- 5- Autosomal dominant breast cancer affects females but not males

Answer & Comments

Answer: 1- It is characterized by loss of heterogeneity

When a cancer of the breast occurs in a member of a high-risk family, the remaining normal copy of the gene is lost through a mutational process called loss of heterozygosity (LOH). The LOH event is a somatic (localized to the breast tissue only) mutation and is not inherited. The result of the two mutational events is that the breast tumor carries one germline mutation and one somatic mutation of BRCA1 or 2. The tumor only grows in the tissue where the second mutation or LOH event occurred. Therefore, the cancer susceptibility gene is what is inherited, not the cancer itself. This means a probability of getting cancer or an increased risk of getting cancer is inherited, not the cancer itself. Therefore, not everyone who is a carrier of a cancer susceptibility gene will get cancer. Additionally, a person who does not carry a particular cancer susceptibility gene is not assured that she or he will not get cancer. Loss of locus heterogeneity characterises autosomal dominant breast cancer which is due to mutations in BRCA1 and BRCA2 (inherited in an autosomal dominant pattern).



[Q: 271] OnExamination - Basic Science

Which of the following is characteristically inherited in an autosomal recessive manner?

- 1- Achondroplasia
- 2- Adult polycystic kidney disease
- 3- C1 esterase deficiency
- 4- Familial hypercholesterolaemia
- 5- Friedreich's ataxia

Answer & Comments

Answer: 5- Friedreich's ataxia

Achondroplasia, APKD, C1 esterase deficiency (hereditary angio-oedema) and familial hypercholesterolaemia are usually inherited as autosomal dominant traits. Friedreich's

ataxia is characteristically an autosomal recessive inheritance.



[Q: 272] OnExamination - Basic Science

A 17-year-old male presented with episodes of low back pain. On clinical examination he is tall and has features of Marfan syndrome. You refer him for echocardiography and he asks why it is needed.

Which of the following is the most common abnormality seen in people with Marfan syndrome?

- 1- Bicuspid aortic valve
- 2- Coarctation of the aorta
- 3- Dilation of the aortic sinuses
- 4- Mitral valve prolapse
- 5- Primum atrial septal defect

Answer & Comments

Answer: 3- Dilation of the aortic sinuses

"The normal aorta has three gentle bulges, the aortic sinuses, just distal to the semilunar attachments of the three leaflets of the aortic valve. The cross sectional diameter of the aorta at the nadir of the leaflet attachment where the aorta and ventricular muscle meet, and at the upper limit of the attachment at the sinutubular junction, are very similar, with the leaflets supported with a spatial relation as if to the sides of a cylinder. The diameter of the more distal circle at the sinutubular junction is, if anything, slightly smaller than the left ventricular outflow. This relation is lost in the Marfan syndrome. The aortic root becomes bulbous and the attachments of the leaflets are splayed out.



[Q: 273] OnExamination - Basic Science

A 16-year-old profoundly deaf boy on holiday in the UK from Denmark presents with

recurrent episodes of syncope and is found to have a long QT interval on his ECG. His faxed medical records indicate that he has Jervell and Lange Nielsen Syndrome.

Which of the following genes is affected in this condition?

- 1- CACNA1c gene
- 2- Caveolin 3 related gene
- 3- Human Ether-a-go-go related gene
- 4- KCNQ1 gene
- 5- SCN5A gene

Answer & Comments

Answer: 4- KCNQ1 gene

Mutations in the KCNE1 and KCNQ1 genes cause Jervell and Lange-Nielsen syndrome. The KCNE1 and KCNQ1 genes provide instructions for making proteins that work together to form a channel across cell membranes. These channels transport positively charged potassium atoms (ions) out of cells. The movement of potassium ions through these channels is critical for maintaining the normal functions of inner ear structures and cardiac muscle. (Read more ...)

All the other genes mentioned are associated with long QT syndromes. The Human Ether-a-go-go Related Gene (HERG) is the gene affected by drugs that lengthen QT interval inadvertently; erythromycin, terfenadine, and ketoconazole. How HERG got its name dates back to Hollywood in the 1960s and involves the fruit fly (*Drosophila*), Whiskey, dancing and a Californian nightclub.



[Q: 274] OnExamination - Basic Science

A 29-year-old male presents to you seeking advice regarding starting a family. He has common variable immunodeficiency and wants to know *what is the risk of passing this on to his children?*

- 1- less than 5%
- 2- 25%
- 3- 33%
- 4- 50%
- 5- over 70%

Answer & Comments

Answer: 1- less than 5%

Common variable immunodeficiency involves low levels of most or all of the immunoglobulin classes, a lack of B lymphocytes or plasma cells that are capable of producing antibodies, and is associated with frequent bacterial infections. The cause of CVID is unknown but a family member may be affected in approximately 20%, but there is no clear pattern of inheritance.



[Q: 275] OnExamination - Basic Science

Which ONE of the following statements regarding X-linked diseases is correct?

- 1- Can occur with equal severity in males and females
- 2- Include G6PD deficiency, ornithine transcarbamylase deficiency, hypophosphataemic rickets and von Willebrands disease
- 3- Do not show anticipation
- 4- Are usually associated with male infertility
- 5- Are not usually associated with immune deficiency

Answer & Comments

Answer: 1- Can occur with equal severity in males and females

X-linked recessive diseases can occur with the same severity in females in certain situations - having an affected father and carrier mother (seen in G6PD deficiency), Turners syndrome, X-chromosome isodisomy, unequal

lyonisation, in an XY individual with testicular feminisation syndrome and where there is an X/autosome translocation through a gene (DMD). Fragile X syndrome shows anticipation with triplet repeat expansion. Y-linked diseases can be associated with male infertility. There are several X-linked immune deficiency syndromes - severe combined immune deficiency, chronic granulomatous disease, agammaglobulinaemia (Bruton's disease), and Wiscott-Aldrich syndrome. Hypophosphataemic rickets is X-linked dominant, and Von Willebrand's disease is inherited in an autosomal dominant manner



[Q: 276] OnExamination - Basic Science

A 35-year-old male presents with oral and genital mucocutaneous ulcerations associated with polyarthritis affecting the lower limbs. He is currently on warfarin for a recent episode of pulmonary embolism.

Which of the genetic association is most commonly associated with his condition:

- 1- HLA A3
- 2- HLA B5
- 3- HLA B27
- 4- HLA DR3
- 5- HLA DR2

Answer & Comments

Answer: 2- HLA B5

This is Behcet's disease. It is associated with increased risk of thrombosis. It is linked to HLA B5.



[Q: 277] OnExamination - Basic Science

Which of the following is a polygenic disorder?

- 1- Ankylosing spondylitis
- 2- Erythropoietic porphyria

- 3- Fragile X syndrome
- 4- Huntington's disease
- 5- Pendred's syndrome

Answer & Comments

Answer: 1- Ankylosing spondylitis

Unlike the other conditions, no one specific genetic defect has been identified to account for ankylosing spondylitis. Huntington's chorea is autosomal dominant condition. Fragile X syndrome is due to a trinucleotide repeat at the FMR 1 gene on the X chromosome. Erythropoietic porphyria is an autosomal recessive condition as is Pendred's syndrome.



[Q: 278] OnExamination - Basic Science

Transcription RNA (tRNA) has three bases specific for a particular amino acid with which it binds to messenger RNA (mRNA).

This specific area of tRNA is called the

- 1- anticodon
- 2- codon
- 3- exon
- 4- intron
- 5- transposon

Answer & Comments

Answer: 1- anticodon

mRNA has codons which are bound by the anticodons on tRNA during translation of protein synthesis. Exons are coding sequences in the mRNA and introns are areas of unknown function. Transposons are genetic sequences that have been transposed from one part of DNA to another.



[Q: 279] OnExamination - Basic Science

With respect to lipoprotein transport and metabolism in the body, the following statements are correct EXCEPT:

- 1- Chylomicrons are synthesized in the liver.
- 2- HDL is assembled in the extracellular space.
- 3- Arterial walls contain cells with LDL receptors.
- 4- VLDL transformation to LDL occurs in the liver.
- 5- Cholesterol is required for the formation of red blood cell membranes.

Answer & Comments

Answer: 1- Chylomicrons are synthesized in the liver.

Chylomicrons are formed in the gut from exogenous triacylglycerols and cholesterol. They are released into the lymph and thereby enter the blood. They are not formed in the liver.



[Q: 280] OnExamination - Basic Science

Which of the following are found in eukaryotic AND prokaryotic cells?

- 1- Chromosomes
- 2- Introns
- 3- Linear DNA
- 4- Nuclear membrane
- 5- Ribosomes

Answer & Comments

Answer: 5- Ribosomes

Eukaryotes (higher organisms) have multiple chromosomes in the genome which is separated from the rest of the cell by nuclear membranes. Prokaryotes lack a membrane bound nucleus, and their DNA occurs in a

circular form. Transcription of eukaryotic genes requires non-coding sequences (introns) in the mRNA to be spliced out before translation at the ribosome. Both Eukaryotes and Prokaryotes have a ribosome, though the ribosome is significantly larger in eukaryotes



[Q: 281] OnExamination - Basic Science

A 17-year-old male who appears tall and thin for his age, presents with a high arch palate, chest wall deformities and livedo reticularis.

Which of the following is also associated with this syndrome?

- 1- Autosomal Dominance
- 2- Methionine accumulation
- 3- Osteopetrosis
- 4- Positive Guthrie test
- 5- Upward dislocation of the lens

Answer & Comments

Answer: 2- Methionine accumulation

This syndrome is most likely to be homocystinuria. Marfan's syndrome is associated with upward dislocation of the lens, but not with livedo reticularis, which is seen in Homocystinuria due to the venous thrombosis in the small vessels of the skin. Homocystinuria is associated with downward dislocation of the lens, and is an Autosomal Recessive disorder. Osteoporosis, and not osteopetrosis is seen in homocystinuria. A positive Guthrie test is associated with Phenylketonuria. Reduced activity of cystathionine α -synthase results in accumulation of homocysteine and methionine, interfering with collagen cross-linking, which is the cardinal feature of Homocystinuria.



[Q: 282] OnExamination - Basic Science

Which one of the following conditions is DNA analysis the most useful diagnostic test?

- 1- Adult polycystic kidney disease
- 2- Down's syndrome
- 3- Huntington's chorea
- 4- Hypertrophic Obstructive Cardiomyopathy
- 5- Klinefelter's syndrome

Answer & Comments

Answer: 3- Huntington's chorea

Klinefelter's syndrome and Down's syndrome are diagnosed principally by chromosomal analysis/karyotype - XXY in the former and trisomy C21 or translocation in the latter. A trinucleotide CAG repeat expansion in the huntingtin gene is diagnostic of Huntington disease. The majority of cases of HOCM are autosomal dominantly inherited yet defective genes are located on a variety of chromosomes. DNA linkage analysis is used to assist in the diagnosis of adult PCKD but the presence of multiple copies continues to complicate the development of reagents for direct genetic testing, at least of the 70% of PKD1 that is replicated elsewhere.



[Q: 283] OnExamination - Basic Science

Mutation in which of the following is associated with Alport's syndrome?

- 1- Collagen type 1 gene
- 2- Collagen type 5 gene
- 3- Fibrillin- gene
- 4- FMR-1 gene
- 5- Type II procollagen gene

Answer & Comments

Answer: 2- Collagen type 5 gene

Mutations in the COL4A5 gene cause approximately 80 percent of Alport syndrome cases. Several hundred different mutations have been identified, the majority of which cause a change in the sequence of amino acids (the building blocks of proteins) in a region of the alpha5(IV) collagen chain that is critical for combining with other type IV collagen chains. Other mutations severely decrease or prevent the production of the alpha5(IV) chains. As a result, there is a serious deficiency of the type IV collagen network in the basement membranes of the kidney, inner ear, and eye



[Q: 284] OnExamination - Basic Science

Which of the following is NOT true regarding the polymerase chain reaction:

- 1- It is used to amplify DNA but not RNA
- 2- The amount of DNA required makes it unsuitable for early prenatal diagnosis
- 3- Synthetic short DNA primers which flank the sequence of interest are required to initiate the amplification
- 4- It utilizes the thermostable properties of Taq DNA polymerase
- 5- It can be used to detect the presence of viral DNA in human disease

Answer & Comments

Answer: 2- The amount of DNA required makes it unsuitable for early prenatal diagnosis

rt-PCR is used to amplify RNA rather than PCR specifically. Preimplantation diagnosis uses IVF and genetic analysis of 3 day old embryos, before selective transfer of unaffected embryos to uterus.



[Q: 285] OnExamination - Basic Science

Which of the following disorders is characterised by an autosomal recessive mode

of inheritance?

- 1- Achondroplasia
- 2- Congenital Adrenal Hyperplasia
- 3- Familial hypercholesterolaemia
- 4- Hereditary Haemorrhagic Telangiectasia
- 5- Huntington's disease

Answer & Comments

Answer: 2- Congenital Adrenal Hyperplasia

All the others are autosomal dominant of course.



[Q: 286] OnExamination - Basic Science

Mutation in which of the following is associated with Ehler-Danlos syndrome?

- 1- Collagen type 1 gene
- 2- Collagen type 5 gene
- 3- Fibrillin- gene
- 4- FMR-1 gene
- 5- Type II procollagen gene

Answer & Comments

Answer: 1- Collagen type 1 gene

The mutations in the COL1A1 gene that cause the arthrochalasia type of Ehlers-Danlos syndrome lead to a pro-alpha1(I) chain that is missing a critical segment. The absence of this segment interferes with the assembly and structure of type I collagen molecules and their processing into collagen fibrils. Tissues that are rich in type I collagen, such as the skin, bones, and tendons, are affected by this change, which leads to the characteristic features of this type of Ehlers-Danlos syndrome.



[Q: 287] OnExamination - Basic Science

Which of the following is true regarding

chromosomes?

- 1- Down's syndrome is most commonly due to an extra copy of chromosome 21 inherited from the father.
- 2- A Fetus with triploidy will have 47 chromosomes
- 3- Heterochromatin is mostly composed of active genes
- 4- The normal human karyotype contains 22 pairs of autosomes
- 5- Telomeres provide the point of attachment to the mitotic spindle

Answer & Comments

Answer: 4- The normal human karyotype contains 22 pairs of autosomes

The human karyotype consists of 22 pairs of autosomes and 1 pair of sex chromosomes. Down's syndrome is most commonly due to trisomy of C21 with the majority a consequence of non-dysjunction within the ovum. Trisomy results in 47 chromosomes whereas Triploidy is the presence of 3 complete sets of chromosomes instead of two in all cells. Heterochromatin is of little genetic significance containing mostly inactivated genes. Telomeres are the distal extremities of the chromosomal arms but the centromeres provide the point of attachment to the mitotic spindle.



[Q: 288] OnExamination - Basic Science

Which of the following conditions is most likely to be detectable by growth monitoring?

- 1- Hyperthyroidism
- 2- Hypothyroidism
- 3- Pseudohypoparathyroidism
- 4- XYY Syndrome
- 5- Insulin dependent diabetes mellitus

Answer & Comments

Answer: 2- Hypothyroidism

Benefits of growth monitoring include:

Early detection of conditions such as:

- " hypothyroidism.
- " growth hormone insufficiency.
- " syndromes: Turners, Russell-Silver, Noonan's, skeletal dysplasias.
- " growth impairment e.g. coeliac disease, inflammatory bowel disease or chronic renal failure.
- " intracranial tumours.
- " short normal children.
- " children with short stature.
- " Health promotion: impaired growth may be associated with child abuse or neglect for example.
- " Focus of interest for parents.

Public health aspects:

- " secular trend of increasing growth.
- " linking growth patterns in fetal life and early infancy with adult patterns of disease.
- " link between height and social circumstances.



[Q: 289] OnExamination - Basic Science

Which molecule is produced in the nucleus, matures in the cytoplasm, binds to the ribosome and initiates protein synthesis?

- 1- messenger RNA
- 2- ribosomal RNA
- 3- RNA nucleotide
- 4- RNA polymerase
- 5- transfer RNA

Answer & Comments

Answer: 1- messenger RNA

Protein synthesis consists of two phases. Transcription is where one strand of the DNA double helix is used as a template by RNA polymerase to synthesize messenger RNA from RNA nucleotides. The mRNA then migrates into the cytoplasm maturing - for example by the splicing of non-coding sequences. Translation occurs when the ribosome binds to mRNA at the start codon and transfer RNA brings amino acids into position along the mRNA template. The ribosome moves from codon to codon along the mRNA producing a polypeptide sequence.



[Q: 290] OnExamination - Basic Science

A 22-year-old female is diagnosed with cystinuria following recurrent episodes of renal colic.

Which of the following is characteristic of cystinuria?

- 1- Autosomal dominant inheritance
- 2- Premature coronary artery disease
- 3- Cataracts
- 4- Cystine deposition within the liver
- 5- Radio-opaque renal calculi

Answer & Comments

Answer: 5- Radio-opaque renal calculi

Cystinuria is an autosomal recessive condition associated with the inadequate reabsorption of cystine (as well as ornithine, arginine, and lysine - Useful mnemonic COAL) in the nephron causing nephrolithiasis - stones are at least partially radio-opaque. It accounts for less than 3% of renal calculi and has an incidence of 1 in 2,500. The foundation of cystine stone prevention is adequate hydration and urinary alkalinization



[Q: 291] OnExamination - Basic Science

Which one of the following conditions is a polygenic disorder?

- 1- Amyotrophic lateral sclerosis
- 2- Congenital adrenal hyperplasia
- 3- Friedreich's ataxia
- 4- Huntington's disease
- 5- Klinefelter's syndrome

Answer & Comments

Answer: 1- Amyotrophic lateral sclerosis

All the other conditions are associated with a specific gene defect -CAH and Friedreich's being autosomal recessive with Huntington's being dominant. Klinefelter's is due to a Chromosomal abnormality XXY. No specific defect has been detected thus far with ALS.



[Q: 292] OnExamination - Basic Science

Restriction enzymes:

- 1- Cut DNA
- 2- Join two pieces of DNA together
- 3- Synthesize DNA
- 4- Degrade DNA
- 5- Are involved in cell cycle arrest

Answer & Comments

Answer: 1- Cut DNA

Restriction enzymes cut DNA at sequences specific for each restriction enzyme, they are vital tools for molecular biology and molecular genetic research.



[Q: 293] OnExamination - Basic Science

The level of cellular telomerase activity will affect:

- 1- The rate of cell growth
- 2- Cell death
- 3- The number of cell divisions a cell is capable of undergoing
- 4- Cell survival
- 5- RNA synthesis

Answer & Comments

Answer: 3- The number of cell divisions a cell is capable of undergoing

The telomere is a DNA sequence at the end of each chromosome which becomes progressively shorter with each division the cell undergoes. When it is reduced to a critical length the cell is not capable of dividing, the enzyme telomerase is able to lengthen the telomere thus preventing this occurring.



[Q: 294] OnExamination - Basic Science

The Polymerase Chain Reaction (PCR) is used to amplify small amounts of DNA for further analysis. First the DNA double helix must be split into two strands.

This is achieved by

- 1- alkali solution
- 2- centrifugation
- 3- DNA polymerase
- 4- heating to nearly 100°C
- 5- viral reverse transcriptase

Answer & Comments

Answer: 4- heating to nearly 100°C

To the small sample of DNA are added two oligonucleotides with sequences that have affinity for both ends of the area of DNA that is being studied. A thermostable DNA polymerase is also added. At 94°C DNA literally melts into two single strands and with cooling the oligonucleotides bind to the areas

surrounding the particular area of DNA that is being analysed. These act as primers for the DNA polymerase and a new double helix of DNA is formed. The cycle is repeated doubling the amount of DNA each time.



[Q: 295] OnExamination - Basic Science

Which of the following disorders is characterised by an autosomal dominant mode of inheritance?

- 1- Beta-thalassaemia
- 2- Cystic fibrosis
- 3- Marfan syndrome
- 4- Wilson's disease
- 5- Xeroderma Pigmentosa

Answer & Comments

Answer: 3- Marfan syndrome

All the others are autosomal recessive of course.



[Q: 296] OnExamination - Basic Science

Parents of a 6-year-old boy present concerned that their son may be carrying the gene for Huntingtons disease. The father was diagnosed with the disease at age 32. The mother has been genetically screened and is not a carrier of the gene.

What the likelihood is of their son suffering with Huntingtons disease?

- 1- 0 risk
- 2- 1 in 2
- 3- 1 in 4
- 4- 1 in 8
- 5- 3 in 4

Answer & Comments

Answer: 2- 1 in 2

Huntington's disease (HD), a progressive, degenerative neurological disease, has an autosomal dominant mode of transmission. This means that only one copy of the faulty gene is required in the genotype for the patients to be a sufferer. With the above case the father is heterozygous which means he himself only has one copy of the gene (two copies of the gene are very unlikely with extremely severe phenotypes probably incompatible with life) and the mother seems to have no copies of the gene. In this case with an autosomal dominant disease, the likelihood of a child developing the disease is 1 in 2 as it is expected that 50% of the offspring of this couple will have a faulty gene.

Symptoms of this disease tend to start to develop in early middle age and include an unsteady gait and jerky involuntary movements, accompanied later by behavioural changes and progressive dementia. The defective gene is located on chromosome 4. Genetic screening is now available



[Q: 297] OnExamination - Basic Science

Restriction enzymes:

- 1- Cut DNA
- 2- Join two pieces of DNA together
- 3- Synthesize DNA
- 4- Degrade DNA
- 5- Are involved in cell cycle arrest

Answer & Comments

Answer: 1- Cut DNA

Restriction enzymes cut DNA at sequences specific for each restriction enzyme, they are vital tools for molecular biology and molecular genetic research.



[Q: 298] OnExamination - Basic Science

The Polymerase Chain Reaction (PCR) is used to amplify small amounts of DNA for further analysis. First the DNA double helix must be split into two strands.

This is achieved by

- 1- alkali solution
- 2- centrifugation
- 3- DNA polymerase
- 4- heating to nearly 100°C
- 5- viral reverse transcriptase

Answer & Comments

Answer: 4- heating to nearly 100°C

To the small sample of DNA are added two oligonucleotides with sequences that have affinity for both ends of the area of DNA that is being studied. A thermostable DNA polymerase is also added. At 94°C DNA literally melts into two single strands and with cooling the oligonucleotides bind to the areas surrounding the particular area of DNA that is being analysed. These act as primers for the DNA polymerase and a new double helix of DNA is formed. The cycle is repeated doubling the amount of DNA each time.



[Q: 299] OnExamination - Basic Science

Which one of the following conditions is a polygenic disorder?

- 1- Amyotrophic lateral sclerosis
- 2- Congenital adrenal hyperplasia
- 3- Friedreich's ataxia
- 4- Huntington's disease
- 5- Klinefelter's syndrome

Answer & Comments

Answer: 1- Amyotrophic lateral sclerosis

All the other conditions are associated with a specific gene defect -CAH and Friedreich's being autosomal recessive with Huntington's being dominant. Klinefelter's is due to a Chromosomal abnormality XXY. No specific defect has been detected thus far with ALS.



[Q: 300] OnExamination - Basic Science

Which molecule is produced in the nucleus, matures in the cytoplasm, binds to the ribosome and initiates protein synthesis?

- 1- messenger RNA
- 2- ribosomal RNA
- 3- RNA nucleotide
- 4- RNA polymerase
- 5- transfer RNA

Answer & Comments

Answer: 1- messenger RNA

Protein synthesis consists of two phases. Transcription is where one strand of the DNA double helix is used as a template by RNA polymerase to synthesize messenger RNA from RNA nucleotides. The mRNA then migrates into the cytoplasm maturing - for example by the splicing of non-coding sequences. Translation occurs when the ribosome binds to mRNA at the start codon and transfer RNA brings amino acids into position along the mRNA template. The ribosome moves from codon to codon along the mRNA producing a polypeptide sequence.



[Q: 301] OnExamination - Basic Science

Which of the following is true regarding chromosomes?

- 1- Down's syndrome is most commonly due to an extra copy of chromosome 21 inherited from the father.

- 2- A Fetus with triploidy will have 47 chromosomes
- 3- Heterochromatin is mostly composed of active genes
- 4- The normal human karyotype contains 22 pairs of autosomes
- 5- Telomeres provide the point of attachment to the mitotic spindle

Answer & Comments

Answer: 4- The normal human karyotype contains 22 pairs of autosomes

The human karyotype consists of 22 pairs of autosomes and 1 pair of sex chromosomes. Down's syndrome is most commonly due to trisomy of C21 with the majority a consequence of non-dysjunction within the ovum. Trisomy results in 47 chromosomes whereas Triploidy is the presence of 3 complete sets of chromosomes instead of two in all cells. Heterochromatin is of little genetic significance containing mostly inactivated genes. Telomeres are the distal extremities of the chromosomal arms but the centromeres provide the point of attachment to the mitotic spindle.



[Q: 302] OnExamination - Basic Science

Which of the following disorders is characterised by an autosomal dominant mode of inheritance?

- 1- Beta-thalassaemia
- 2- Cystic fibrosis
- 3- Marfan syndrome
- 4- Wilson's disease
- 5- Xeroderma Pigmentosa

Answer & Comments

Answer: 3- Marfan syndrome

All the others are autosomal recessive of course.



[Q: 303] OnExamination - Basic Science

The level of cellular telomerase activity will affect:

- 1- The rate of cell growth
- 2- Cell death
- 3- The number of cell divisions a cell is capable of undergoing
- 4- Cell survival
- 5- RNA synthesis

Answer & Comments

Answer: 3- The number of cell divisions a cell is capable of undergoing

The telomere is a DNA sequence at the end of each chromosome which becomes progressively shorter with each division the cell undergoes. When it is reduced to a critical length the cell is not capable of dividing, the enzyme telomerase is able to lengthen the telomere thus preventing this occurring.



[Q: 304] OnExamination - Basic Science

A 22-year-old female is diagnosed with cystinuria following recurrent episodes of renal colic.

Which of the following is characteristic of cystinuria?

- 1- Autosomal dominant inheritance
- 2- Premature coronary artery disease
- 3- Cataracts
- 4- Cystine deposition within the liver
- 5- Radio-opaque renal calculi

Answer & Comments

Answer: 5- Radio-opaque renal calculi

Cystinuria is an autosomal recessive condition associated with the inadequate reabsorption of cystine (as well as ornithine, arginine, and lysine - Useful mnemonic COAL) in the nephron causing nephrolithiasis - stones are at least partially radio-opaque. It accounts for less than 3% of renal calculi and has an incidence of 1 in 2,500. The foundation of cystine stone prevention is adequate hydration and urinary alkalinization



[Q: 305] OnExamination - Basic Science

Transcription RNA (tRNA) has three bases specific for a particular amino acid with which it binds to messenger RNA (mRNA).

This specific area of tRNA is called the

- 1- anticodon
- 2- codon
- 3- exon
- 4- intron
- 5- transposon

Answer & Comments

Answer: 1- anticodon

mRNA has codons which are bound by the anticodons on tRNA during translation of protein synthesis. Exons are coding sequences in the mRNA and introns are areas of unknown function. Transposons are genetic sequences that have been transposed from one part of DNA to another.



[Q: 306] OnExamination - Basic Science

Which ONE of the following have their own self replicating DNA?

- 1- Golgi body
- 2- Lysosomes
- 3- mitochondria
- 4- Peroxisome

5- Rough Endoplasmic Reticulum

Answer & Comments

Answer: 3- mitochondria

Abnormalities of Mitochondrial DNA are associated with inherited conditions such as Leber's OA, MELAS syndrome and DIDMOAD (Dr Vajira H. W. Dissanayake)



[Q: 307] OnExamination - Basic Science

A Plasmid is best described as

- 1- a recombinant section of DNA
- 2- a small viral particle
- 3- bacterial DNA separate from the chromosome
- 4- consist of multiple copies of a single gene
- 5- having multiple origins of replication [25]

Answer & Comments

Answer: 3- bacterial DNA separate from the chromosome

Plasmids are circular molecules of bacterial DNA separate from the bacterial chromosome. They are usually small consisting of a few thousand base pairs, carry one or a few genes, and have a single origin of replication. Genes on plasmids with multiple copies are usually expressed at higher levels. In nature these genes often encode for proteins such as those needed for bacterial resistance. Plasmids can be used to clone genes by splicing a particular gene into a plasmid and then allowing the bacteria to multiply - this is then called recombinant plasmid DNA.



[Q: 308] OnExamination - Basic Science

A 28-year-old lady presents with multiple café-au-lait spots. A diagnosis of

neurofibromatosis type 1 is made.

What is true of the NF1 gene?

- 1- Inherited in a recessive fashion
- 2- Inherited in an X-linked fashion
- 3- On chromosome 17
- 4- On mitochondrial genome
- 5- Related to NF2 gene

Answer & Comments

Answer: 3- On chromosome 17

Neurofibromatosis due to NF1 is found on chromosome 17 and is inherited as an autosomal dominant fashion. NF2 is associated with acoustic neuromas and is found on Chromosome 22.



[Q: 309] OnExamination - Basic Science

Mutation in which of the following is associated with Marfan's syndrome?

- 1- Collagen type 1 gene
- 2- Collagen type 5 gene
- 3- Fibrillin- gene
- 4- FMR-1 gene
- 5- Type II procollagen gene

Answer & Comments

Answer: 3- Fibrillin- gene

Mutation in the fibrillin-1 gene is felt to be responsible for Marfan's syndrome. In marfan syndrome the lack of normal fibrillin-1 leads to overactivity of TGF- β in the wall of the aorta and the heart valves, leading to damage and destruction to the connective tissue which weakens that aortic wall and heart valves, causing them to stretch. Type 1 collagen gene defects are found in osteogenesis imperfecta and type 3 in Ehler's Danlos syndrome. Type II procollagen defect is found in hereditary spodyloarthopathy.



[Q: 310] OnExamination - Basic Science

It has been suggested that cystic fibrosis (autosomal recessive) has a high prevalence in some populations because heterozygotes are resistant to the effects of chloride-secreting diarrhea.

This is best described as an example of

- 1- Mutation
- 2- Gene flow
- 3- Genetic drift
- 4- Natural selection
- 5- Linkage disequilibrium

Answer & Comments

Answer: 4- Natural selection

Natural selection is the likely explanation as it appears that heterozygous for CF may offer some protection against diarrhoeal illnesses particularly typhoid.



[Q: 311] OnExamination - Basic Science

Which of the following abnormalities is associated with short stature?

- 1- 45, XO karyotype
- 2- 47, XXY karyotype
- 3- 47 XYY karyotype
- 4- fragile X syndrome
- 5- homocystinuria

Answer & Comments

Answer: 1- 45, XO karyotype

Turner's syndrome, 45 XO is characteristically associated with short stature. Klinefelter's is associated with tall stature. In Fragile X, height is usually unaffected and Homocystinuria may have a Marfan's habitus.



[Q: 312] OnExamination - Basic Science

A 17-year-old female is affected by an inherited disorder. She has two brothers who are unaffected. She has two sisters both are affected. Her father is affected but not her mother.

What is the mode of inheritance?

- 1- Autosomal Dominant [50]
- 2- Autosomal Recessive
- 3- Mitochondrial
- 4- X-linked Dominant
- 5- X-linked Recessive

Answer & Comments

Answer: 4- X-linked Dominant

X-linked dominant disorders are rare (e.g. Vitamin D-resistant rickets). The affect both sexes but females more than males. All children of a homozygous mother are affected. Half the sons and half the daughters inherit the disorder from an affected mother with the trait. An affected father passes the disease to all his daughters but none of his sons - as in this example. Another explanation would be an autosomal dominant disorder inherited, by chance, only by the daughters. However, this is not the best answer.



[Q: 313] OnExamination - Basic Science

Benign Essential Tremor:

- 1- Is present characteristically at rest
- 2- Occur with lesion in sub thalamus
- 3- Occur in liver disease
- 4- Alcohol improves the tremor
- 5- Is autosomal recessive in inheritance

Answer & Comments

Answer: 4- Alcohol improves the tremor

There is no tremor at rest, but a rhythmic oscillation develops when the patient holds the arms outstretched. A positive family history is obtained in over half of such patients and the pattern of inheritance in such families indicates an autosomal dominant trait. Alcohol suppresses essential tremor, but the mechanism responsible is unknown



[Q: 314] OnExamination - Basic Science

You would be likely to observe the lowest heritability score in

- 1- Cystic fibrosis
- 2- Spina bifida
- 3- Cleft lip/palate
- 4- Mumps
- 5- Congenital heart disease

Answer & Comments

Answer: 4- Mumps

Mumps is due to an infective agent and hence has the lowest heritability score. All the other disorders have a genetic aetiological component eg CF autosomal recessive.



[Q: 315] OnExamination - Basic Science

In X-linked recessive inheritance, which of the following is true?

- 1- The male to female ratio is 2:1.
- 2- Each son of a female carrier has a 1:4 risk of being affected.
- 3- Each daughter of a female carrier has a 1:4 risk of being a carrier.
- 4- Daughters of affected males will all be carriers.
- 5- The family history is often positive since new mutations are rare.

Answer & Comments

Answer: 4- Daughters of affected males will all be carriers.

Over 250 X-linked recessive disorders have been described. The commonest include red/green colour blindness, Duchenne and Becker muscular dystrophies, Fragile X Syndrome, G6PD deficiency, haemophilias A&B, and Hunter's Syndrome. The abnormal gene is carried on the X chromosome, and in the carrier female, the normal allele on her other X chromosome protects her from the disease. Since the male does not have this protection, he manifests the disease. In X-linked inheritance therefore:

- " Males are all affected.
- " Females only occasionally show mild sign of disease.
- " Each son of a female carrier has a 1:2 chance of being affected.
- " Each daughter of a female carrier has a 1:2 risk of being a carrier.
- " Daughters of affected males will all be carriers, but sons of affected males will not be affected since the Y chromosome is derived from father.

The family history may be negative, however, since new mutations are fairly common. Carrier females can be identified from time to time from mild clinical manifestations and from specific tests such as biochemical markers, e.g. CK in DMD.



[Q: 316] OnExamination - Basic Science

A 59-year-old woman has had insulin dependent diabetes mellitus for over two decades. The degree of control of her disease is characterized by the laboratory finding of a HbA1c of 10.1%. She complains of repeated episodes of abdominal pain following meals. These episodes have become more frequent

and last for longer periods over the last couple of months. On physical examination, there are no abdominal masses and no organomegaly of the abdomen, and she has no tenderness to palpation.

Which of the following findings is most likely to be present:

- 1- Ruptured aortic aneurysm
- 2- Hepatic infarction
- 3- Mesenteric artery occlusion
- 4- Acute pancreatitis
- 5- Chronic renal failure

Answer & Comments

Answer: 3- Mesenteric artery occlusion

Diabetes- especially Type 2 diabetes- is associated with macrovascular disease. Smoking is a further risk factor for macrovascular atherosclerosis. After a meal splanchnic blood flow is increased. If the mesenteric artery is occluded the lack of blood flow to the bowel will produce ischaemic type pain. Chronic renal failure may be present but would not cause post prandial pain. Ruptured aortic aneurysm would normally present acutely with hypotension, cold lower limbs with reduced pulses and a pulsatile, tender abdominal mass. Pancreatitis is unlikely given the history and the lack of epigastric tenderness. Hepatic infarction should lead to right upper quadrant pain.



[Q: 317] OnExamination - Basic Science

Regarding the genetics of bronchial asthma

- 1- Mendelian recessive inheritance
- 2- Leukotriene concentrations are influenced by genetic factors
- 3- Similar concordance in monozygotic and dizygotic twins
- 4- Genetic linkage is to a single chromosome 13

- 5- There is a contribution from HLA alleles

Answer & Comments

Answer: 5- There is a contribution from HLA alleles

There may be genetic linkage of atopic trait to chromosome 11, with association between response to antigen and HLA haplotype. IgE concentrations are influenced by genetic factors.



[Q: 318] OnExamination - Basic Science

A 65-year-old man has IgG paraproteinaemia with plasma cells in his bone marrow aspirate.

Which of the following is most likely with his underlying condition?

- 1- Renal failure is the commonest cause of death
- 2- Sclerotic bone lesions are characteristic
- 3- Biphosphonates are first line therapy for the treatment of associated hypercalcaemia
- 4- Treatment with interferon alpha improves survival
- 5- bone resorption is due to increased osteoblast activity

Answer & Comments

Answer: 4- Treatment with interferon alpha improves survival

Infection is the commonest cause of death in multiple myeloma because of immunoparesis. Lytic bone lesions commonly occur due to increased osteoclastic activity, rarely sclerotic lesions occur. Vigorous hydration and diuresis are cornerstones of the treatment of severe hypercalcaemia in myeloma. Interferon alpha is the only agent found to prolong plateau phase of disease (used in maintenance therapy).



[Q: 319] OnExamination - Basic Science

In idiopathic thrombocytopaenic purpura there antibodies directed at which of the following?

- 1- ADP receptor
- 2- Antithrombin III
- 3- ATP receptor
- 4- Glycoprotein IIb/IIIa complex
- 5- Platelet-activating factor

Answer & Comments

Answer: 4- Glycoprotein IIb/IIIa complex

In many cases of idiopathic thrombocytopaenic purpura, the cause is not actually idiopathic but autoimmune, with antibodies against platelets being detected in approximately 80% of patients. Most often these antibodies are against platelet membrane glycoproteins IIb-IIIa or Ib-IX, and are of the IgG type. The coating of platelets with IgG renders them susceptible to opsonization and phagocytosis by splenic macrophages.



[Q: 320] OnExamination - Basic Science

Which one of the following statements regarding T cells in their recognition of antigen is correct:

- 1- By TcR interaction with antigen in the extracellular fluid.
- 2- As conformational epitope at the cell surface.
- 3- As linear peptide sequences bound covalently to self MHC class I or class II at the cell surface.
- 4- Derived from protein only
- 5- Only when presented by "professional" antigen presenting cells.

Answer & Comments

Answer: 4- Derived from protein only

TCR's interact with a complex of antigenic peptide bound to MHC molecules and presented at the cell surface of the antigen presenting cell. T cells recognise antigen as linear peptide epitopes associated with self MHC molecules. Peptides associate non-covalently with MHC class I or class II molecules at the cell surface. T cells recognise peptides, therefore T cell antigens are derived from proteins, but not from carbohydrate or lipid molecules. 'Professional' antigen presenting cells are required for the induction phase of the T cell response, but activated effector T cells can recognise antigen presented by MHC molecules on a wide range of cell types (for example, CTL recognition of virally infected target cells). (c) Dr Alan Cann



[Q: 321] OnExamination - Basic Science

Which one of the following is correct concerning Mast cells?

- 1- Do not contain heparin
- 2- Degranulation releases lytic enzymes and inflammatory mediators from storage granules
- 3- Are lipophilic cells involved in inflammatory and immune responses
- 4- Cross-linkage of surface IgA molecules by antigen may cause an anaphylactic reaction
- 5- Depletion of circulating mast cells can cause mastocytosis

Answer & Comments

Answer: 2- Degranulation releases lytic enzymes and inflammatory mediators from storage granules

Mast cells are basophilic cells in the connective and subcutaneous tissues, which

are involved in inflammatory and immune responses. They contain storage granules that contain lytic enzymes (e.g. tryptase) and inflammatory mediators, e.g. histamine, heparin, 5-HT, leukotrienes, platelet aggregating factor, leucocyte chemotactic factor and hyaluronidase. Release of these mediators occurs during mast cell degranulation, which can be triggered by: tissue injury, drugs, complement activation, and foreign antigenic material. An anaphylactic reaction occurs when a previously sensitised individual is re-exposed to the antigen. It is an IgE mediated immune response. Mastocytosis occurs when excess mast cells are present in the circulation or as tissue infiltrates.



[Q: 322] OnExamination - Basic Science

Which of the following statements is true of Xenotransplantation?

- 1- is the transfer of organs between species
- 2- is the transfer of tissue grown in-vitro
- 3- has not yet been performed in humans
- 4- requires a close HLA match
- 5- is characterised by a vigorous early cell - mediated immune response

Answer & Comments

Answer: 1- is the transfer of organs between species

Xenotransplantation is the transfer of organs between species - particularly the transfer of animal organs to humans. Compare this with allotransplantation which is the transfer of organs within the same species.

There have already been several documented cases of xenotransplantation - baboon heart, chimpanzee kidneys. A close HLA match is not possible of course unless a transgenic species is used that express human major

histocompatibility complexes (HLA). Early immune response is humoral - IgM.



[Q: 323] OnExamination - Basic Science

A 50-year-old African American woman presents with episodic toe and finger problems characterized by pallor, cyanosis, suffusion and pain of the fingers and toes in response to cold. She later develops difficulty in swallowing and dyspnoea.

Which of the following immunological investigations is the most specific for this lady's condition:

- 1- Topoisomerase I
- 2- Anticentromere antibody
- 3- Antitopoisomerase I (Scl-70) antibody
- 4- Rheumatoid factor
- 5- Anti-ds DNA antibody

Answer & Comments

Answer: 3- Antitopoisomerase I (Scl-70) antibody

This lady has systemic sclerosis as suggested by the dyspnoea (lung fibrosis, dysphagia (oesophageal involvement) and Raynaud's. The lung involvement would argue against this being CREST and hence positive anticentromere antibodies. . SCL-70 antigen (topoisomerase I) is a DNA-binding protein sensitive to nucleases and is typically found in progressive systemic sclerosis.



[Q: 324] OnExamination - Basic Science

Which of the following statements concerning the thymus is true?

- 1- The majority of cortical thymocytes express either CD4 or CD8.
- 2- CD4/CD8 double positive cells are eliminated by a process of negative selection.

- 3- A proportion of alpha/beta+ thymocytes undergo isotype switching to produce gamma/delta+ T cells.
- 4- Thymocytes whose TcR bind with high affinity to self Ag/MHC complexes are clonally deleted.
- 5- Mature thymocytes express surface IgM and IgD.

Answer & Comments

Answer: 4- Thymocytes whose TcR bind with high affinity to self Ag/MHC complexes are clonally deleted.

Cortical thymocytes are immature forms, and either do not express CD4 or CD8 (double negative cells) or express both CD4 and CD8 (double positive cells). As the cells mature, they pass to the thymic medulla, where they lose expression of either CD4 or CD8, to become single positive cells.

Negative selection occurs at the stage when thymocytes express both CD4 and CD8, but co-expression of these markers does not mediate negative selection. Negative selection occurs when a thymocyte expresses a TcR with high affinity for self antigen:MHC complexes in the thymic micro-environment.

Once a thymocyte has successfully rearranged and expressed an alpha/beta or gamma/delta TcR it is committed to that lineage.

Thymocytes whose TcR bind with high affinity to self Ag/MHC complexes are clonally deleted by a process of negative selection.

B cells express IgM and IgD; T cells do not!



[Q: 325] OnExamination - Basic Science

A 16-year-old female develops an urticarial reaction and is suspected of peanut allergy yet measurement of peanut-specific IgE antibodies on RAST testing is within the normal range.

Which of the following would be the next most appropriate investigation?

- 1- C1 esterase concentrations
- 2- No other test necessary diagnosis can be secured on history
- 3- Food provocation testing
- 4- Mast cell degranulation testing
- 5- Skin prick testing

Answer & Comments

Answer: 5- Skin prick testing

The most appropriate next test would be skin allergen testing as a food provocation test is often unnecessary and can prove rather dangerous although is the gold standard.



[Q: 326] OnExamination - Basic Science

Deficiency of T-cells is found in

- 1- Wiscott-Aldrich syndrome
- 2- hereditary angio-oedema
- 3- chronic granulomatous disease
- 4- Chediak-Higashi syndrome
- 5- congenital agammaglobulinaemia

Answer & Comments

Answer: 1- Wiscott-Aldrich syndrome

congenital agammaglobulinaemia = antibody deficiency (X-linked) hereditary angio-oedema = C1 esterase deficiency (autosomal dominant) chronic granulomatous disease = disorder of oxidative mechanism - susceptible to pyogenic/fungal infections. Deficiency of T-cells is found in also found in ataxia telangiectasia. Chediak-Higashi syndrome is autosomal recessive and is characterized by defective fusion with the phagosome in phagocytes.



[Q: 327] OnExamination - Basic Science

Which of the following cell types have a prime role in recognizing and destroying virus infected cells in an HLA class I-restricted manner.

- 1- Macrophages
- 2- B cells
- 3- Dendritic cells
- 4- Platelets
- 5- CD8+ T lymphocytes

Answer & Comments

Answer: 5- CD8+ T lymphocytes

CD8+ T lymphocytes are otherwise known as cytotoxic T lymphocytes. The T cell receptor on the surface of the CD8+ T cell recognizes virus peptides in the context of self HLA class I molecules on the surface of virus infected antigen presenting cells. The infected cell is then lysed. Dendritic cells are professional antigen presenting cells presenting antigen to CD4+ helper cells and CD8+ T cells, but have no cytotoxic potential. B cells produce antibodies. Macrophages are also antigen presenting cells but are also involved in recognition and eradication of certain intracellular pathogens but in a non-HLA restricted manner.



[Q: 328] OnExamination - Basic Science

The Mantoux reaction is an example of which type of hypersensitivity reaction ?

- 1- Type I hypersensitivity
- 2- Type II hypersensitivity
- 3- Type III hypersensitivity
- 4- Type IV hypersensitivity
- 5- Humoral Immune Response

Answer & Comments

Answer: 4- Type IV hypersensitivity

The tuberculin skin test is an example of a Type IV hypersensitivity, or a delayed type hypersensitivity (DTH) reaction. This reaction develops when primed Th1 cells encounter their specific antigen. An inflammatory response evolves over 24-72 hours. In the tuberculin skin test, the injected antigen is protein derived from M.Tuberculosis. Th1 cells recognise peptide bound to MHC on APCs and are activated to secrete pro-inflammatory cytokines including IL2, IFN-gamma, TNF, chemokines and GM-CSF. There is recruitment of inflammatory cells predominantly macrophages to the site of antigen deposition, with activation of phagocytes. Some cytokines (TNF) as well as macrophage derived lytic enzymes cause local tissue destruction. CD8+ T-cells have also been implicated in DTH responses. The result is an indurated erythematous lesion at the site of injection which indicates previous exposure to TB.



[Q: 329] OnExamination - Basic Science

Which of the following would be most in keeping with a diagnosis of polymyalgia rheumatica?

- 1- raised creatinine kinase
- 2- increased alkaline phosphatase
- 3- sudden loss of vision in one eye
- 4- shoulder and pelvic girdle pain in 40-year-old man
- 5- erythema nodosum

Answer & Comments

Answer: 2- increased alkaline phosphatase

Liver enzymes are elevated in most patients. Visual disturbances are suggestive of temporal arteritis not PMR, and are due to ischaemic changes in ciliary arteries (optic

neuritis/infarction) and less commonly due to central artery occlusion. Raised CK in polymyositis. PMR is rare before the age of 50 years.



[Q: 330] OnExamination - Basic Science

Which of the following suggests a diagnosis of Hurler's Syndrome rather than Hunter's Syndrome?

- 1- X-linked inheritance
- 2- Mental retardation
- 3- Skeletal abnormalities
- 4- Cloudy cornea
- 5- Cardiomyopathy

Answer & Comments

Answer: 4- Cloudy cornea

Hunter's Syndrome (MPS-2) is of X-linked inheritance. The cornea are clear. The skeletal involvement tends to be mild with no gibbous present, though scoliosis is often found. Mental retardation and heart involvement are less severe than in Hurler's Syndrome. Hurler's Syndrome (MPS0) is autosomal recessive in inheritance and is associated with cloudy cornea. There is severe mental retardation, and gibbous deformation of the spine is characteristic. There is the characteristic coarse facies with hepatosplenomegaly.



[Q: 331] OnExamination - Basic Science

A 26-year-old man presented with exertional thigh cramps. He described his urine turning to burgundy colour especially after prolonged exertion. Investigations in the recent past had excluded presence of any significant ischaemic or inflammatory condition affecting his lower limbs.

On examination, pulse was 74 beats per minute, blood pressure was 122/66 mmHg,

heart sounds were normal and there was no organomegaly found on abdominal examination.

Investigations:

serum urea 4.6 mmol/L (2.5-7.5)

serum creatinine 88 µmol/L (60-110)

serum corrected Calcium 2.32 mmol/L (2.2-2.6)

serum phosphate 0.92 mmol/L (0.8-1.4)

serum creatine kinase 76 U/L (24-195)

urine tested positive for myoglobin

What is the next most appropriate investigation?

- 1- bone marrow examination for gauchers cells
- 2- kidney biopsy
- 3- liver biopsy
- 4- muscle biopsy
- 5- urine for porphyrins

Answer & Comments

Answer: 4- muscle biopsy

The exertional thigh cramps, the presence of myoglobin and change in colour of urine after exercise suggests glycogen storage disease type V - McArdles syndrome. The most appropriate investigation for this is muscle biopsy which reveals subsarcolemmal deposits of glycogen appear at the periphery of fibres.



[Q: 332] OnExamination - Basic Science

A 24-year-old man presented with exertional thigh cramps. He described his urine turning to burgundy colour especially after prolonged exertion. Investigations in the recent past had excluded presence of any significant ischaemic or inflammatory condition affecting his lower limbs.

On examination, his pulse was 74 beats per minute, blood pressure was 122/66 mmHg, heart sounds were normal and there was no organomegaly found on abdominal examination.

Investigations:

serum sodium 132 mmol/L (135-145)

serum urea 4.4 mmol/L (2.5-7.5)

serum creatinine 88 µmol/L (60-110)

serum corrected calcium 2.32 mmol/L (2.2-2.6)

serum phosphate

serum creatine kinase 88 U/L (24-195)

urine tested positive for myoglobin

What is the most likely diagnosis?

- 1- acute intermittent porphyria
- 2- alkaptonuria
- 3- gauchers disease
- 4- glycogen storage disease
- 5- multiple myeloma

Answer & Comments

Answer: 4- glycogen storage disease

The exertional thigh cramps, the presence of myoglobin and change in colour of urine after exercise suggests glycogen storage disease type V - McArdles syndrome.



[Q: 333] OnExamination - Basic Science

A 78-year-old man who lives alone and prepares his own food is found to have numerous ecchymotic hemorrhagic areas around his hair follicles. The hairs are fragmented and several hematomas are present in the muscles of the arms and legs. Except for the absence of teeth, the rest of the physical examination is unremarkable. Laboratory examination reveals a normal

Prothrombin time, APTT and full blood count is normal except for a hematocrit of 28%.

Deficiency of which of the following is most likely to explain this patients presentation?

- 1- Folate
- 2- Vitamin A
- 3- Vitamin C
- 4- Vitamin K
- 5- Zinc

Answer & Comments

Answer: 3- Vitamin C

This man has features of scurvy. Scurvy is the clinical state arising from dietary deficiency of vitamin C (ascorbic acid). It results in impaired collagen synthesis. The typical pathological manifestations of vitamin C deficiency are noted in dentine, osteoid and capillary vessel wall tissues

Clinical features include gum swelling, friability, bleeding, and infection with loose teeth; mucosal petechiae; scleral icterus (late, probably secondary to hemolysis); and pale conjunctiva are seen. Fractures, dislocations, and tenderness of bones are common in children. Bleeding into muscles and joints may be seen. Perifollicular hyperkeratotic papules, perifollicular hemorrhages, purpura, and ecchymoses are the classical skin manifestation of scurvy.



[Q: 334] OnExamination - Basic Science

Which of the following is a characteristic feature of acute intermittent porphyria?

- 1- autosomal recessive inheritance
- 2- excessive faecal protoporphyrin excretion
- 3- excessive urinary porphobilinogen during an acute attack
- 4- hypernatraemia during attacks
- 5- photosensitivity

Answer & Comments

Answer: 3- excessive urinary porphobilinogen during an acute attack

Features of acute intermittent porphyria include urinary porphobilinogen excretion raised between attacks, hyponatraemia during an acute attack and autosomal dominant inheritance.



[Q: 335] OnExamination - Basic Science

Proteins known as cyclins:

- 1- Regulate the menstrual cycle
- 2- Are differentially expressed throughout the cell cycle
- 3- Regulate antibody production
- 4- Regulate the cycling of receptors between the cell surface and the cytoplasm
- 5- Regulate DNA transcription

Answer & Comments

Answer: 2- Are differentially expressed throughout the cell cycle

Cyclins are key regulators of the cell cycle, different cyclins are expressed at different stages of the cell cycle.



[Q: 336] OnExamination - Basic Science

Phosphorylation of protein tyrosine residues is associated with:

- 1- Cell signalling pathways
- 2- Protein degradation
- 3- Alzheimer's disease
- 4- Protein synthesis
- 5- Creutzfeldt-Jacob Disease

Answer & Comments

Answer: 1- Cell signalling pathways

Phosphorylation of specific tyrosine residues of components of cell signalling pathways is often a key event in the activation of the pathway.



[Q: 337] OnExamination - Basic Science

Apoptosis is the process of programmed cell death and occurs in cells that have damaged DNA. A mediator of this process is a tumour suppressor gene that inhibits mitosis and promotes apoptosis.

This gene is:-

- 1- bcl-2
- 2- caspases
- 3- fas (CD95)
- 4- p53
- 5- ras

Answer & Comments

Answer: 4- p53

bcl-2 is an inhibitor of apoptosis. fas is a cell receptor and caspases are present in all cells both promote apoptosis but are not tumour suppressor genes. ras is an oncogene.



[Q: 338] OnExamination - Basic Science

Which of the following organelles contains enzymes responsible for the digestion of constituents of cells and tissues?

- 1- endoplasmic reticulum
- 2- Golgi apparatus
- 3- lysosomes
- 4- microtubules
- 5- mitochondria

Answer & Comments

Answer: 3- lysosomes

The lysosomes contain the enzymes and molecules such as oxidases, free radical etc responsible for the breakdown of intracellular components. Microtubules are involved in mitotic processes and intracellular transportation. The mitochondria produce energy for cellular functions.



[Q: 339] OnExamination - Basic Science

Apoptosis is induced by:

- 1- Activation of caspases
- 2- The MAP kinase pathway
- 3- DNA synthesis
- 4- Antibodies
- 5- Necrosis

Answer & Comments

Answer: 1- Activation of caspases

A key event in the initiation of apoptosis is the activation of a cascade of cysteine-aspartate specific proteases known as caspases.



[Q: 340] OnExamination - Basic Science

Northern blotting is a technique that can be used to detect:

- 1- Antibodies
- 2- DNA
- 3- RNA
- 4- Protein
- 5- Plasmids

Answer & Comments

Answer: 3- RNA

Northern blotting is a means of detecting RNA, frequently used to quantify specific mRNA transcript levels.



[Q: 341] OnExamination - Basic Science

Which of the following statements regarding messenger RNA (mRNA) is correct?

- 1- mRNA never contains introns.
- 2- mRNA is translated into proteins in the nucleus.
- 3- mRNA contains the bases cytosine and thymine.
- 4- reverse transcriptase uses mRNA as a template to produce complementary DNA.
- 5- mRNA is used in the Southern blotting technique.

Answer & Comments

Answer: 4- reverse transcriptase uses mRNA as a template to produce complementary DNA.

The structure of mRNA is similar to DNA except that uracil replaces thymine as one of the bases. Both coding (exons) and non-coding regions of DNA are initially transcribed into mRNA. Splicing is required for mature mRNA to be produced only consisting of introns. Translation occurs in the cytoplasm. Southern blotting is a technique that uses denatured fragments of DNA in a gel to bind to DNA probes in order to detect the presence of particular genes or sequences of DNA. The enzyme reverse transcriptase can be used by viruses to insert viral mRNA into the host genome.

Reference:

Hannam et al. MRCP (Paediatrics) Part 1 MCQs. page 121 ?WB Saunders. Reproduced with permission.



[Q: 342] OnExamination - Basic Science

Which of the following statements regarding myosin is correct?

- 1- It drives smooth muscle contraction
- 2- Forms filaments in a pentameric array with two heavy chains and three light chains
- 3- myosin heavy chain mutations are associated with development of familial hypertrophic cardiomyopathy
- 4- Contains an cAMP-binding sites
- 5- Has no function when not part of a filament

Answer & Comments

Answer: 3- myosin heavy chain mutations are associated with development of familial hypertrophic cardiomyopathy

Myosin drives striated muscle contraction, and can be divided into 2 groups ?conventional (class II myosins) which form filaments in a hexameric array of 2 heavy chains and two pairs of light chains. Unconventional myosins do not form filaments and perform varied functions in a broad range of cells (eg organelle transport, endocytosis). Myosin contains an ATP and actin-binding sites. Other myosin related genetic disorders besides the heavy chain mutations in cardiomyopathy include Carney complex (trismus-pseudocamptodactyly), Type 1b Usher syndrome and non-syndromic deafness.



[Q: 343] OnExamination - Basic Science

In a study of elderly patients with atrial fibrillation, patients receiving warfarin (n= 6000), 6% had strokes or died as a consequence of stroke, whereas in subjects treated with aspirin (n = 8000), 9 % had stroke or death from a stroke over the 3 year study period (p=0.001). The risk of stroke in an untreated population with atrial fibrillation over this time was 12%.

Which of the following percentages is the approximate annual incidence of stroke in the treated population in this study?

- 1- 2.6%
- 2- 3.3%
- 3- 5.5%
- 4- 6.9%
- 5- 7.7%

Answer & Comments

Answer: 1- 2.6%

One needs to calculate the incidence as follows:

In the group treated with warfarin there were 360 strokes (6% of 6000). In the aspirin treated group there were 720 strokes (9% of 8000). Thus, there are 1080 strokes amongst the treated population (n=14000) over a three year time period. Therefore there are 360 strokes annually in the treated group (14000) giving an annual incidence of stroke of approx 2.6%

Note: remember to divide by three since the study lasted 3 years and the figures given are for the 3 years incidence rates.



[Q: 344] OnExamination - Basic Science

A new rapid test is developed for the screening of Malaria. Blood from 200 patients were analysed by the gold standard laboratory technique and by the new method. There were 100 positive results with the gold standard technique but there were only 50 positive results using the new technique.

Approximately which of the following values reflects the negative predictive value of the new technique?

- 1- 33%
- 2- 50%
- 3- 66%
- 4- 75%
- 5- 90%

Answer & Comments

Answer: 3- 66%

The Negative Predictive Value is Number of True negatives / (number of true negatives + False negatives). It reflects the proportion of patients with negative test results who are correctly diagnosed.

In the new technique there were 100 true positives (i.e. 100 true negatives) and 50 False negatives (where the new test missed the diagnosis). Thus the negative predictive value is $100/(100+50) = 66\%$.



[Q: 345] OnExamination - Basic Science

A researcher compared the mean scores for nausea on a rating scale between standard therapy and a new drug in the treatment of chemotherapy induced nausea.

Which one of the following is the most appropriate statistical test?

- 1- Chi-square test
- 2- Paired T-test
- 3- Life table analysis (log rank test)
- 4- Pearson correlation
- 5- Unpaired T-test

Answer & Comments

Answer: 5- Unpaired T-test

The two-sample unpaired t test is used to test the null hypothesis that the two populations corresponding to the two random samples are equal.

For a paired t test, the data is dependent, i.e. there is a one-to-one correspondence between the values in the two samples. For example, the same subject measured before and after a process change, or the same subject measured at different times.



[Q: 346] OnExamination - Basic Science

A cohort study of 7,500 patients aimed to find out whether the use of olive oil in cooking has an impact on cardiovascular disease. Approximately half the patients used olive oil in cooking and half used animal fat.

Which of these is a disadvantage of a cohort study?

- 1- It is not possible to measure the incidence/risk of a disease
- 2- They are susceptible to recall bias; there is a differential ability of patients to remember exposure to a risk factor
- 3- They are not suitable when exposure to risk factors is rare
- 4- They can only provide information about one outcome
- 5- When the outcome of interest is rare a very large sample size is needed.

Answer & Comments

Answer: 5- When the outcome of interest is rare a very large sample size is needed.

A cohort study takes a group of individuals and follows them for a period of time the aim being to study whether the exposure to a particular aetiological factor has an effect on the incidence of disease. As such they are relatively time consuming and expensive to perform. Advantages include being able to study exposure factors that are rare and being less susceptible to recall bias than cohort studies. They are also able to measure the incidence/risk of a disease. Results are usually expressed as the relative risk of developing the disease given exposure to the aetiological factor.



[Q: 347] OnExamination - Basic Science

Which of the following statements is correct regarding standard error of the mean (SEM)

and standard deviation (SD)?

- 1- Standard error of mean is calculated by taking the square root of the standard deviation of the sample means
- 2- Standard deviation invariably falls with increasing sample size
- 3- Standard error of mean increases with sample size
- 4- if standard deviation is greater than the mean the distribution is negative
- 5- Student's t test is a non-parametric test

Answer & Comments

Answer: 4- if standard deviation is greater than the mean the distribution is negative

The Standard error of the Mean = SD/\sqrt{n} . SD does not necessarily fall with sample size as the distribution of values may increase and hence SD increase. SEM would decrease with sample size as can be seen in the above calculation.

The SD would only be greater than the mean if the sample was Negatively Distributed - i.e. the data was negative. This is not the same as 'negatively skewed' where the distribution of data about the mean tails off to the left with the majority of points being greater (the median and the mode are greater than the mean). This question, is a trick ... and quite a trivial one at that. A negative distribution's mean would be, of course, negative but the standard deviation would still be a positive number!

Student's T test is a parametric test comparing normally distributed data.



[Q: 348] OnExamination - Basic Science

Statistical independence may be assumed in which of the following circumstances?

- 1- Successive measures taken on the same individual.

- 2- Stratified sampling from a target population.
- 3- Two matched individuals in a case control study.
- 4- Response to antibiotics of children with otitis media who have a CRP of above 100.
- 5- Diagnosis of pyloric stenosis by ultrasound scan in patients attending a tertiary referral centre.

Answer & Comments

Answer: 2- Stratified sampling from a target population.

Independent events do not affect each other. Thus, the chance of event A occurring is completely unaffected by the chance of B occurring. Two measures on the same individual are clearly dependent, but the same also applies to 2 matched individuals such as in a case control study. The outcome of patients attending a tertiary referral centre is bound to depend on the patients referred, and the facilities and expertise available at that centre. In patients with elevated CRP, one might suspect that there is a higher risk of bacterial otitis media, and, therefore, one might expect a greater response to antibiotics. The response to antibiotics is, therefore, dependent to some extent on the raised CRP.



[Q: 349] OnExamination - Basic Science

In a study of elderly patients with atrial fibrillation, patients receiving warfarin (n=6000) were found to have a rate of stroke of 6% whereas subjects treated with aspirin (n=8000) had a stroke rate of 9.9% over the 3 year study period (p=0.001). The risk of stroke in an untreated population with atrial fibrillation over this time was 12%.

To what do these numbers relate?

- 1- Absolute risk
- 2- Incidence

- 3- Odds risk
- 4- Prevalence
- 5- Relative risk

Answer & Comments

Answer: 2- Incidence

These numbers relate to the INCIDENCE of stroke occurring in various populations over a specified period of time. Prevalence is the numbers of patients with a specified disorder at any one time point. Absolute risk reduction refers to the reduction in the number of patients with stroke following a specific intervention eg ARR of stroke with warfarin vs aspirin is 3.3% over 3 years. Relative risk reduction is $3.3/9.9 \times 100 = 33\%$.



[Q: 350] OnExamination - Basic Science

In significance testing which of these statements is correct?

- 1- A Type I error is to reject the alternative hypothesis when it should be accepted.
- 2- A Type II error is to accept the alternative hypothesis when it should be rejected.
- 3- The probability associated with a Type I error is the significance level.
- 4- The significance level is determined at the end of a significance test.
- 5- The significance level is always set to 5%.

Answer & Comments

Answer: 3- The probability associated with a Type I error is the significance level.

The null hypothesis is that there is no differences between two groups. The alternative hypothesis is that there is a difference. Rejecting the null hypothesis when there really is no difference between the two groups is a Type 1 error. Accepting the null hypothesis (rejecting the alternative

hypothesis) when there is a difference is a type 2 error. Rejection of the null hypothesis depends on the probability - significance level which is usually (but not always) at $p < 0.05$.



[Q: 351] OnExamination - Basic Science

An experienced group of surgeons report on a randomised placebo-controlled trial comparing a particular carotid surgery technique as compared to a sham operation. Their study concludes that 'using this advanced surgical technique reduces the risk of stroke from 4.3% to 3.8% ($p < 0.05$)'.

What has this study proved about the surgical procedure?

- 1- Acceptability
- 2- Effectiveness
- 3- Efficacy
- 4- Safety
- 5- Usefulness

Answer & Comments

Answer: 3- Efficacy

This is an experienced group of vascular surgeons working in ideal conditions. Similar studies have been reported for carotid surgery but it has been difficult to prove their usefulness outside areas of expertise. It is often difficult to generalise the findings in a study group to everyday practice. Efficacy = the effect of something under ideal or laboratory conditions, Effectiveness = the effect of something in the real world.



[Q: 352] OnExamination - Basic Science

Which of the following statements is true regarding statistical interpretation of data?

- 1- The incidence equals the number of newly affected individuals divided by the number

of people at risk for the disease for a given duration.

- 2- The prevalence is readily distinguished from the incidence in relation to cancers.
- 3- The mortality rate is a kind of cumulative prevalence rate.
- 4- The cumulative incidence rate is usually given over a 10 year period.
- 5- The prevalence rate is defined as the total number of cases divided by the total number in the population.

Answer & Comments

Answer: 1- The incidence equals the number of newly affected individuals divided by the number of people at risk for the disease for a given duration.

The incidence can be thought of as the number of new cases occurring in a given time. The cumulative incidence rate is usually reported over a year. Prevalence equals the total number of cases divided by the total number of at risk. In diseases for which the exact onset cannot be determined such as cancers, it may be difficult to distinguish between incidence and prevalence. Mortality rate is a special kind of cumulative incidence rate, with deaths in the numerator and population in the denominator. Case fatality rate, has deaths in the numerator and the number of people with a specific disease in the denominator.



[Q: 353] OnExamination - Basic Science

A trial is proposed to see whether excess alcohol use is a risk factor for osteoporosis. It is decided to perform a case-control study rather than a cohort study.

Which of these is an advantage of a case-control study?

- 1- It can provide information on a wide range of outcomes

- 2- It is possible to measure the incidence of a disease directly
- 3- It is possible to study exposure to factors that are rare
- 4- It is relatively quick, cheap and easy to perform
- 5- The time sequence of events can be assessed

Answer & Comments

Answer: 4- It is relatively quick, cheap and easy to perform

A case-control study compares the characteristics of a group of patients with the disease with a control group of patients who do not have the disease. Other advantages of case-control studies are that they are particularly suitable for rare diseases, a wide range of risk factors can be investigated and there is no loss to follow up. Results are usually quoted as an odds ratio. The incorrect answers are all advantages of cohort studies.



[Q: 354] OnExamination - Basic Science

A new antiplatelet agent has been proven to reduce the risk of stroke in a year from 10% in patients treated with conventional treatment to 6% in patients treated with conventional treatment plus the new agent. The cost of this new drug is ?00 per month.

How much extra would a hospital need to spend to prevent one stroke.

- 1- ?200
- 2- ?000
- 3- ?8000
- 4- ?0000
- 5- ?00000

Answer & Comments

Answer: 4- ?0000

The 'Absolute Risk Reduction' is $10\% - 6\% = 4\%$. The 'Number Needed to Treat' to prevent a stroke therefore equals $100 / 4 = 25$. 25 patients would need to be treated at a cost of ?00/month for 12 months to prevent a stroke which gives the total cost as ?0000.



[Q: 355] OnExamination - Basic Science

In a study of 26000 females, 1300 subjects were found to have either overt or subclinical hypothyroidism. Within this group, the risk of demonstrating either overt or subclinical hypothyroidism was therefore 5%.

What is the best descriptive term of this 5% risk?

- 1- Absolute risk
- 2- Incidence
- 3- Prevalence
- 4- Relative risk
- 5- Specificity

Answer & Comments

Answer: 3- Prevalence

This is the risk of either subclinical or overt hypothyroidism in a female population at any specific time which is the prevalence. This is defined as the rate of a disorder in a specified population at a specified time. Incidence refers to the number of new cases of a disorder developing over a specific time.



[Q: 356] OnExamination - Basic Science

A randomised double-blind placebo controlled study of a cholesterol-lowering drug in the primary prevention of coronary heart disease was conducted over a five-year follow up period. The absolute risk of myocardial infarction in the group-receiving placebo during this time was 10 per cent.

The relative risk of those given the cholesterol lowering medication was 0.8.

What number of patients will need to be treated with active drug for five years to prevent one myocardial infarction?

- 1- 20
- 2- 40
- 3- 50
- 4- 80
- 5- 100

Answer & Comments

Answer: 3- 50

The absolute risk of MI in the treatment group is $10\% \times 0.8 = 8\%$ (as they have a relative risk of 0.8 as compared to the placebo group). $NNT = 1 / \text{absolute relative risk}$. ARR is the risk in control group - risk in treated group. Therefore the ARR is $10\% - 8\%$ and the NNT for that period is $1/0.02 = 50$.



[Q: 357] OnExamination - Basic Science

In a study to find out if concentration of drug X is related to weight, subjects were given 500 mg of the drug and serum levels were measured two hours later.

Which of the following is the best statistical test to evaluate the results?

- 1- Student's paired t-test
- 2- Chi squared test
- 3- Student's unpaired t-test
- 4- Log regression analysis
- 5- Pearsons coefficient

Answer & Comments

Answer: 4- Log regression analysis

Drug concentrations are measured two hours after consumption and the variable of weight is to be factored in on the drugs

pharmacokinetics. Consequently the most appropriate statistical test would be log regression analysis.



[Q: 358] OnExamination - Basic Science

Which of the following would invalidate the use of the unpaired t test in the comparison of mean drug concentrations between two groups of subjects?

- 1- Insufficient statistical power
- 2- Non-normal distribution of data
- 3- small standard error
- 4- small sample size
- 5- unequal sample sizes in both groups

Answer & Comments

Answer: 2- Non-normal distribution of data

The t tests can only be used for parametric (normally distributed) data. Insufficient statistical power a consequence of numbers recruited would not invalidate the results of a t test as it is likely the results would be unlikely to show any difference with too few subjects although it is possible that if the differences were large then irrespective of prior power calculations differences might be seen.



[Q: 359] OnExamination - Basic Science

In a study of 950 subjects with a BMI below 25, a new serological marker for coeliac disease was assessed against the gold standard test of jejunal biopsy. The following results were obtained:

	Test positive	Test negative
Biopsy positive	40	10
Biopsy negative	60	840

What is the sensitivity of this test?

- 1- 40%
- 2- 55%
- 3- 66%
- 4- 80%
- 5- 93%

Answer & Comments

Answer: 4- 80%

Sensitivity relates to the probability that the person with a disease will be correctly identified with the disease. Therefore, in this study, 50 subjects have the disease, of whom 40 are correctly identified with the disease giving a sensitivity of 80%. The specificity is the probability that a person without the disease will be correctly identified by the test. In this case, there are 900 subjects without the disease of whom 840 were identified by the test - giving a specificity of 93%



[Q: 360] OnExamination - Basic Science

A new test is developed for the diagnosis of HIV. Blood from 10,000 patients were analysed by the gold standard technique and by the new method. There were 100 positive results with the gold standard technique but there were 150 positive results using the new technique. *Approximately which of the following values reflects the positive predictive value of the new technique.*

- 1- 33%
- 2- 50%
- 3- 66%
- 4- 75%
- 5- 90%

Answer & Comments

Answer: 3- 66%

The positive predictive value is Number of True Positives/(No of true positives + False

positives). In the new technique there were 100 true positives and 50 False Positives. Thus the positive predictive value is 66%.



[Q: 361] OnExamination - Basic Science

A new rapid test is developed for the screening of Leptospirosis. Blood from 100 patients were analysed by the gold standard laboratory technique and by the new method. There were 20 positive results with the gold standard technique but there were 40 positive results using the new technique.

Approximately which of the following values reflects the positive predictive value of the new technique?

- 1- 33%
- 2- 50%
- 3- 66%
- 4- 75%
- 5- 90%

Answer & Comments

Answer: 2- 50%

The positive predictive value is Number of True Positives/(No of true positives + False positives). In the new technique there were 20 true positives and 20 False Positives. Thus the positive predictive value is $20/(20+20) = 50\%$.



[Q: 362] OnExamination - Basic Science

In a double blind controlled trial assessing the impact of a new antihypertensive in the treatment of stroke versus conventional antihypertensive therapy in the secondary prevention of stroke, the authors report an absolute annual risk reduction in the incidence of stroke of 0.5% and a relative risk reduction of 20% ($p=0.032$). The cost of the new treatment is £100 more expensive per year than conventional therapy.

What would be the cost of implementing the new therapy for each stroke prevented?

- 1- ?000
- 2- ?000
- 3- ?0,000
- 4- ?0,000
- 5- ?0,000

Answer & Comments

Answer: 5- ?0,000

In this case, the annual incidence of stroke is reduced by 0.5% and treatment is £100 more than conventional therapy. The relative risk reduction of 20% means that the annual risk of stroke is 2.5% (0.5% is 1/5 of 2.5%) in the conventionally treated group. Thus for every 200 patients treated 1 less stroke would occur with the new drug versus the conventional therapy. Number Needed to Treat (NNT) is therefore 200 per year to prevent one stroke. Thus the annual cost of this treatment associated with preventing one stroke, despite its significant reduction in stroke reduction ($p=0.032$) would be:

$200 \text{ patients} \times £100 = 20,000.$



[Q: 363] OnExamination - Basic Science

A study of the intellectually handicapped was performed. The 112 subjects, put through program A, showed an increase in their mean IQ score of 6 points. The 115 subjects, put through program B, showed an increase in their mean IQ score of 4. The p value was >0.05 .

Which of the following is true:

- 1- the numbers are too large for a Student t-test
- 2- the study demonstrates the usefulness of program A
- 3- the distribution of individual values is not important

- 4- even though the difference between the means is not significant it would be appropriate to calculate confidence intervals
- 5- the above results would be found by chance in less than 1:20

Answer & Comments

Answer: 4- even though the difference between the means is not significant it would be appropriate to calculate confidence intervals

a-The t-test could be used in the comparison of data and the larger the sample size the more meaningful the data. b-A is no more useful than B or even simply repeating an IQ test? c+d This gives us an idea of the distribution of the data. Confidence intervals may provide more meaningful data concerning the study. e-The chances are greater than 1 in 20 as P is greater than 0.05.



[Q: 364] OnExamination - Basic Science

A publication describes a new diagnostic test for myocardial infarction. You want to know what proportion of patients with a confirmed myocardial infarction will be identified by the test.

Which one of the following measurements would indicate this?

- 1- Accuracy
- 2- Negative predictive value
- 3- Positive predictive value
- 4- Sensitivity
- 5- Specificity

Answer & Comments

Answer: 4- Sensitivity

The specificity of a test is the probability that a test will produce a true negative result when

used on an unaffected population, whereas the sensitivity of a test is the probability that it will produce a true positive result when used on an affected population (as determined by a reference or "gold standard"). The positive predictive value of a test is the probability that a person is affected when a positive test result is observed. The negative predictive value of a test is the probability that a person is not affected when a negative test result is observed. Accuracy is expressed through the above four parameters.



[Q: 365] OnExamination - Basic Science

In a study of 1000 subjects with adrenal incidental tumours, a new serological marker for adrenal carcinoma was assessed against formal histology. The following results were obtained:

	Test positive	Test negative
Histology positive	40	10
Histology negative	50	900

To what does the specificity approximate?

- 1- 50%
- 2- 60%
- 3- 70%
- 4- 80%
- 5- 90%

Answer & Comments

Answer: 5- 90%

Sensitivity relates to the probability that the person with a disease will be correctly identified with the disease. Therefore, in this study, 50 subjects have adrenal carcinoma, of whom 40 are correctly identified with the disease giving a sensitivity of 80%. The specificity is the probability that a person without the disease will be correctly identified by the test. In this case, there are 950 subjects

without adrenal carcinoma of whom 900 were identified by the test (giving a specificity of ~95%.)



[Q: 366] OnExamination - Basic Science

A letter to a medical journal suggested that an established antidepressant may cause photosensitivity. The manufacturer wished to set up a study to determine rapidly and efficiently whether this was a true association.

Which one of the following techniques is most appropriate?

- 1- A case control study
- 2- A dose ranging study
- 3- A double blind, randomised, placebo controlled study
- 4- A meta-analysis
- 5- A sequential trial

Answer & Comments

Answer: 4- A meta-analysis

A sequential trial is one in which the data are analysed after each participant's results become available, and the trial continues until a clear benefit is seen in one of the comparison groups, or it is unlikely that any difference will emerge. The main advantage of sequential trials is that they will be shorter than fixed length trials when there is a large difference in the effectiveness of the interventions being compared. Their use is restricted to conditions where the outcome of interest is known relatively quickly.

In a case control study, patients who have developed a disease are identified and their past exposure to aetiological factors is compared with that of controls who do not have the disease. A double-blind randomized placebo controlled study does not seem appropriate in this case, and a dose-ranging study would be used in the early stages of drug development to identify common side

effects, perhaps toxicity, and threshold efficacy doses. The most appropriate study would probably be a meta-analysis. This is because the drug is in the market place, large studies will have taken place in order for it to obtain its license, the data is available relatively rapidly (compared with the other options in this question), the analysis could be carried out efficiently (cheaply if one were being cynical), and the results of the trial would also be available rapidly.



[Q: 367] OnExamination - Basic Science

In a study of blood pressures in a specific ethnic population, the researcher is concerned that his spread of blood pressures is larger than that described in the general population.

Which of the following terms most appropriately describes the spread of blood pressures?

- 1- Mean
- 2- Median
- 3- Mode
- 4- Standard deviation
- 5- Standard error of the mean

Answer & Comments

Answer: 4- Standard deviation

Standard deviation is a measure of the spread of observations about the mean. It is based on the deviation of each observation from the mean value.

Each value is squared, summed and divided by the total number of observations less one. The standard deviation is the square root of this value.



[Q: 368] OnExamination - Basic Science

A large multi-centre secondary prevention study reports a reduction in the annual

incidence of recurrent subarachnoid haemorrhage from 10% in a medically treated group versus 6% in the group treated with medical therapy plus radiological intervention ($p < 0.005$). The cost of the new treatment is ?000 per patient.

In the first year of treatment, what would be the predicted additional cost of preventing a single recurrent subarachnoid haemorrhage?

- 1- ?000
- 2- ?2000
- 3- ?0000
- 4- ?5000
- 5- ?0000

Answer & Comments

Answer: 4- ?5000

This study shows that annual rate of recurrent subarachnoid haemorrhage is reduced from 10% to 6%. Therefore, if you treated 100 patients for one year you would expect 10 patients with Subarachnoid Haemorrhage in the medically treated group vs 6 patients in the medical plus radiological intervention group - a reduction of 4 patients per hundred. Therefore you would need to treat 25 patients (4/100) to expect one less case of Subarachnoid Haemorrhage. Thus the extra cost of this would be $25 \times 3000 = ?5000$



[Q: 369] OnExamination - Basic Science

In a primary prevention study of stroke comparing a new antihypertensive with conventional antihypertensive therapy, the number of patients who had a stroke over the study period was 200 in group 1 with the new therapy ($n=5200$) versus 250 with conventional therapy ($n=4750$).

Which of the following is the approximate odds ratio for the new therapy?

- 1- 0.25

- 2- 0.5
- 3- 0.75
- 4- 1
- 5- 1.5

Answer & Comments

Answer: 3- 0.75

An odds ratio is calculated by dividing the odds in the treated or exposed group by the odds in the control group. Studies generally try to identify factors that cause harm - those with odds ratios greater than one.

The new therapy odds of an event is $200/5000$ (patients without an event $5200-200$) = 0.04. Group 2's odds event rate is $250/4500$ ($4750-250$) = 0.055. The odds ratio is therefore:

$$0.04/0.055 = 0.73$$

This odds ratio is less than 1, indicating an overall benefit of therapy.



[Q: 370] OnExamination - Basic Science

A clinical investigation examined the effectiveness of a new test for diagnosing Pancreatic carcinoma. The sensitivity was reported as 70%.

Which one of the following statements is correct?

- 1- 70% of people will be correctly classified as having or not having the disease
- 2- 70% of people with an abnormal test result will have the disease
- 3- 70% of people with a normal test result will not have the disease
- 4- 70% of people with the disease will have an abnormal test result
- 5- 70% of people with the disease will have a normal test result

Answer & Comments

Answer: 4- 70% of people with the disease will have an abnormal test result

Sensitivity is the conditional probability that the test will be positive if the condition is present). Specificity is the conditional probability that the test will be negative if the condition is absent. Therefore, interpreting the data there is a 70% probability of the test being positive when tested in a group of patients with the disease.



[Q: 371] OnExamination - Basic Science

A publication assesses a new diagnostic test for thyroid cancer.

Which of the following terms would reflect the number of cases of thyroid cancer correctly identified by this new test?

- 1- accuracy
- 2- negative predictive value
- 3- positive predictive value
- 4- Sensitivity
- 5- Specificity

Answer & Comments

Answer: 4- Sensitivity

The specificity of a test is the probability that a test will produce a true negative result when used on an unaffected population, whereas the sensitivity of a test is the probability that it will produce a true positive result when used on an affected population (as determined by a reference or "gold standard"). The positive predictive value of a test is the probability that a person is affected when a positive test result is observed. The negative predictive value of a test is the probability that a person is not affected when a negative test result is observed. Accuracy is expressed through the above four parameters.



[Q: 372] OnExamination - Basic Science

A study is designed to test the accuracy of faecal occult blood testing in excluding a certain type of bowel cancer. Faecal occult bloods are compared to a gold standard which consists of a battery of tests and pathological diagnosis. In the study 200 prospective patients undergo faecal occult blood testing and are followed up with the other investigations.

The results showed that malignancy was present in 100 patients but the faecal occult blood testing was positive in only 90 patients.

Approximately which of the following values reflects the negative predictive value of the faecal occult blood testing in this study?

- 1- 33%
- 2- 50%
- 3- 66%
- 4- 75%
- 5- 90%

Answer & Comments

Answer: 5- 90%

The Negative Predictive Value is Number of True negatives / (number of true negatives + False negatives). It reflects the proportion of patients with negative test results who are correctly diagnosed.

In the new technique there were 100 true positives who had the disease (i.e. 100 true negatives) and 10 False negatives (where the faecal occult blood test missed the diagnosis). Thus the negative predictive value is $100/(100+10) = 90.9\%$.



[Q: 373] OnExamination - Basic Science

In a study of 1000 patients with autoimmune hepatitis, a new serological test for the disease was assessed against diagnostic liver

biopsy. The following results were obtained:

	Test positive	Test negative
Histology positive	80	20
Histology negative	100	800

To what does the sensitivity of the new test approximate?

- 1- 50%
- 2- 60%
- 3- 70%
- 4- 80%
- 5- 90%

Answer & Comments

Answer: 4- 80%

Sensitivity relates to the probability that the person with a disease will be correctly identified with the disease. Therefore, in this study, 100 subjects have autoimmune hepatitis, of whom 80 are correctly identified with the new test giving a sensitivity of 80%. The specificity is the probability that a person without the disease will be correctly identified by the test. In this case, there are 900 subjects without autoimmune hepatitis of whom 800 were identified by the test - giving a specificity of ~89%.



[Q: 374] OnExamination - Basic Science

Adequate randomisation can be assumed in which of the following circumstances?

- 1- All consecutive patients attending a tertiary referral centre.
- 2- A sample using healthy volunteers.
- 3- A sample of those judged to be appropriate for inclusion in the study.
- 4- A sample based on a family cluster.
- 5- A stratified random sample.

Answer & Comments

Answer: 5- A stratified random sample.

The actual patients included in the study often differ substantially from what was initially intended. This dramatically alters one's interpretation of a study. The target population includes all those with a given disease, and is seldom fully accessible. The accessible population available for study may be biased in time or place. It is important to randomise when selecting a sample which are supposed to represent the target population. In simple randomisation, every member of the population is numbered, and a random sample is selected. In a stratified random sample, groups of interest are identified, and then randomisation occurs within those groups. In systematic sampling a "periodic" approach is used. This is not really random and is open to alteration and bias. In a cluster sample, a natural grouping of population is used (such as a family), but this may well be unrepresentative of the whole population. Classic errors in randomisation are:

" Consecutive sampling, which may well not be representative if the study time is short.

" Convenience sampling: strong potential for bias, with volunteers generally healthier than others.

" Judgmental sample: including those that you want only. The potential for systematic error is enormous.



[Q: 375] OnExamination - Basic Science

A study was performed to assess the usefulness of a new autoantibody test for the detection of suspected Hashimoto's disease. The test was undertaken in 1000 subjects who complained of tiredness and all test results were compared with FNA biopsy results which provided a gold standard for the diagnosis of Hashimoto's disease.

The following table lists the results:

	Antibody +ve	Antibody -ve	Total
Hashimoto's disease confirmed at FNA	35	15	50
No evidence of disease at FNA	30	920	950

Approximately, what is the sensitivity of the antibody test for the detection of Hashimoto's disease?

- 1- 50%
- 2- 60%
- 3- 70%
- 4- 80%
- 5- 90%

Answer & Comments

Answer: 3- 70%

The Sensitivity of a test is the ability of a test to identify those with the condition. In this example, 50 individuals had Hashimoto's disease according to the Gold standard test of biopsy, with 35 of these being identified by the antibody test.

$$35/50 \times 100 = 70\%$$



[Q: 376] OnExamination - Basic Science

A study of an established antihypertensive agent against placebo reports that the risk of death due to cardiac causes is lower on treatment. It gives 5-year mortality due to cardiac causes as 12% on placebo and 8% on treatment. The authors conclude that 'a 33% reduction in cardiac deaths is seen with treatment'.

The figure '33%' represents which of the following?

- 1- Absolute Risk Reduction

- 2- Control Event Rate
- 3- Experimental Event Rate
- 4- Number Needed to Treat
- 5- Relative Risk Reduction

Answer & Comments

Answer: 5- Relative Risk Reduction

An understanding of quantities discussed in 'Evidence-based medicine' is becoming increasingly important for the exam. If a drug reduces the incidence of heart attacks from 10% to 5% then ...

- " the control event rate (CER) is 10%
- " the experimental event rate (EER) is 5%
- " the relative risk reduction (RRR) is 50%
- " the absolute risk reduction (ARR) is 5%
- " the number needed to treat (NNT) is $100\% / 5\% = 20$



[Q: 377] OnExamination - Basic Science

In a trial of statin therapy in the secondary prevention of ischaemic heart disease, therapy is shown to reduce cardiovascular mortality from 12% to 8% over the 5 years duration of the study. In comparison with standard therapy, *what is the number of patients that need to be treated to prevent one death over five years?*

- 1- 5
- 2- 10
- 3- 20
- 4- 25
- 5- 50

Answer & Comments

Answer: 4- 25

The drug has reduced the risk of death post MI by 4% over 5 years. Therefore if 100 people were treated we could expect the prevention of 4 deaths. Therefore in order to prevent 1 death, 25 individuals would need to be treated.



[Q: 378] OnExamination - Basic Science

In a study assessing two different antiplatelet agents in the prevention of stroke, 10,000 subjects were randomised to receive either the standard therapy or the new therapy. Over the study period of five years, the side effect of major gastrointestinal bleeding was 3% in the standard therapy group compared with 2% in the new therapy group.

Which of the following is the absolute risk reduction associated with the new therapy in major GI bleeds?

- 1- 1%
- 2- 3%
- 3- 10%
- 4- 15%
- 5- 33%

Answer & Comments

Answer: 1- 1%

We are not told whether there is a significant difference between the two groups yet in the standard antiplatelet therapy group there is a risk of GI bleed of 3% vs 2% with the new therapy. This is a 1% absolute risk reduction and a 33% relative risk reduction (1/3). The number of people that would need to be treated with the new drug to avert the major effect of bleeding would be 100.



[Q: 379] OnExamination - Basic Science

Suppose you are attempting to find a disease-causing gene, and you have identified a number of families in which the disease is

transmitted. If you have no knowledge of the gene product and no reasonable candidate locus, *which of the following would be the first technique you would be most likely to use?*

- 1- Linkage analysis
- 2- DNA sequencing
- 3- Single strand conformation polymorphism (SSCP) analysis
- 4- Denaturing gradient gel electrophoresis (DGGE)
- 5- Fluorescence in situ hybridization (FISH)

Answer & Comments

Answer: 1- Linkage analysis

Linkage analysis. Southern blotting is a laboratory procedure in which DNA fragments that have been electrophoresed through a gel are transferred to a solid membrane, such as nitrocellulose. The DNA can then be hybridized with a labeled probe and exposed to X-ray film. Somatic cell hybridization is a physical gene mapping technique in which somatic cells from two different species are fused and allowed to undergo cell division. Chromosomes from one species are selectively lost, resulting in clones with only one or a few chromosomes from one of the species. FISH is a molecular cytogenetic technique in which labelled probes are hybridized with chromosomes and then visualized under a fluorescence microscope. SSCP is a technique for detecting variation in DNA sequence by running single-stranded DNA fragments through a non-denaturing gel. Fragments with differing secondary structure (conformation) caused by sequence variation will migrate at different rates.



[Q: 380] OnExamination - Basic Science

Which of the following genetic mutation is responsible for Marfan's syndrome?

- 1- Collagen

- 2- Elastin
- 3- Fibrillin
- 4- Microfilament
- 5- Microtubule

Answer & Comments

Answer: 3- Fibrillin

Marfan's syndrome occurs due to a mutation in the fibrillin gene. Most patients, who are prone to develop an aortic aneurysm as a component of Marfan syndrome, can be identified by detection of mutations in the fibrillin-1 gene. Patients with the rarer form of Marfan's syndrome, which is characterized by contractural arachnodactyly instead of loose joints, can usually be identified by detection of a mutation in the fibrillin-2 gene that is similar in structure to the gene for fibrillin-1. Preliminary data suggest that patients with mutations in the fibrillin-2 gene are not prone to develop aneurysms.



[Q: 381] OnExamination - Basic Science

Which of the following does N-acetylcysteine replenish?

- 1- Cystathionine
- 2- Cytochrome P450
- 3- Glucuronyl transferase
- 4- Glutathione
- 5- Sulfatase

Answer & Comments

Answer: 4- Glutathione

Acetylcysteine, the N-acetyl derivative of the naturally occurring amino acid, L-cysteine, is a mucolytic agent and sulfhydryl donor acting as an antidote for paracetamol overdose.



[Q: 382] OnExamination - Basic Science

In one gene mapping technique, denatured DNA from metaphase chromosomes is hybridized with a radioactively labeled probe. This DNA is then exposed to film to reveal the approximate chromosomal location of the DNA in the probe.

Which technique does this best describe?

- 1- Southern blotting
- 2- In situ hybridization
- 3- Somatic cell hybridization
- 4- Fluorescence in situ hybridization
- 5- Single strand conformation polymorphism (SSCP) analysis

Answer & Comments

Answer: 2- In situ hybridization

The technique described is 'in situ hybridization'.

Southern blotting is a laboratory procedure in which DNA fragments that have been electrophoresed through a gel are transferred to a solid membrane, such as nitrocellulose. The DNA can then be hybridized with a labeled probe and exposed to X-ray film. Somatic cell hybridization is a physical gene mapping technique in which somatic cells from two different species are fused and allowed to undergo cell division. Chromosomes from one species are selectively lost, resulting in clones with only one or a few chromosomes from one of the species. FISH is a molecular cytogenetic technique in which labelled probes are hybridized with chromosomes and then visualized under a fluorescence microscope. SSCP is a technique for detecting variation in DNA sequence by running single-stranded DNA fragments through a non-denaturing gel. Fragments with differing secondary structure (conformation) caused by sequence variation will migrate at different rates.



[Q: 383] OnExamination -
Emergency medicine

Which one of the following is a recognised treatment option in poisoning?

- 1- ethanol for isopropyl alcohol poisoning
- 2- glucagon for cocaine poisoning
- 3- methylene blue for cyanide poisoning
- 4- N-acetylcysteine in paraquat poisoning
- 5- pralidoxime in sarin (nerve gas) poisoning

Answer & Comments

Answer: 5- pralidoxime in sarin (nerve gas) poisoning

Sarin is an organophosphorus. Pralidoxime reactivates acetyl cholinesterase enzyme. Should be used in the first few hours.

Ethanol reduces the formation of toxic metabolites produced after ingestion of methanol and ethylene glycol, but not isopropyl alcohol. Glucagon is used in symptomatic β -blocker overdose. N-acetylcysteine is used in paracetamol overdose. Methylene blue is the antidote for serious methaemoglobinemia.



[Q: 384] OnExamination -
Emergency medicine

You have been called to the ward by the senior nurse, to review a repeat Calcium result. The repeat result is 3.9 mmol/l (2.2 - 2.6), the previous result 4 hours earlier was 3.2. The patient has a disseminated malignancy with an unknown primary.

Which of the following statements is most correct when considering the hypercalcaemia of malignancy?

- 1- NSAIDs are indicated for bone pain in this patient
- 2- Bisphosphonates inhibit osteoblast function thereby lowering calcium

- 3- A prolonged QT interval is associated with hypercalcaemia
- 4- On neurological examination, hyporeflexia may be exhibited
- 5- Calcitonin is of greater benefit than bisphosphonates in the treatment of hypercalcaemia of malignancy

Answer & Comments

Answer: 4- On neurological examination, hyporeflexia may be exhibited

This is an oncological emergency. Hyporeflexia is a common clinical sign in patients with hypercalcaemia. NSAIDs should not be prescribed in patients with hypercalcaemia, as they reduce renal blood flow, thus inhibiting urinary calcium excretion. Bisphosphonates inhibit bone resorption by osteoclasts, and are the first line pharmacological treatment of hypercalcaemia of malignancy, calcitonin use limited by its association with anaphylaxis. ECG changes in hypercalcaemia include bradycardia, prolonged PR, short QT, widened T waves and arrhythmia



[Q: 385] OnExamination -
Emergency medicine

A 64-year-old woman presented 10 hours after ingestion of 12g of Quinine Sulphate.

Which of the following is the most common characteristic clinical feature in this situation?

- 1- Blindness
- 2- Bradycardia
- 3- Hyperacusis
- 4- Hyperglycaemia
- 5- Hypotension

Answer & Comments

Answer: 1- Blindness

A tachycardia is seen in overdose, not a bradycardia. Quinine may cause tinnitus and

deafness, but not hyperacusis. Blindness is a characteristic feature of quinine overdose. Blurred vision may proceed to complete blindness within a few hours.

As vision is lost the pupils become dilated and unresponsive to light. Initially only narrowing of the retinal arterioles may be seen on fundoscopy but after 3 days retinal oedema may appear.

Hypotension may be a feature, especially in the context of dysrhythmia, but I feel that blindness is the "common characteristic feature".



[Q: 386] OnExamination -
Emergency medicine

A 40 year-old man suffers an intracerebral infarction.

Which of the following features in this patient would not be considered as a risk factor for his stroke?

- 1- Blood Pressure 156/72 mmHg
- 2- Cocaine use
- 3- Mitral valve prolapse
- 4- Plasma cholesterol of 6.5 mmol/l
- 5- Smoker of 5 cigarettes per day

Answer & Comments

Answer: 4- Plasma cholesterol of 6.5 mmol/l

Unlike IHD/MI, epidemiological studies do not show an increased risk of stroke associated with hypercholesterolaemia. This contrasts markedly with the risk reduction in stroke associated with statin therapy which suggests that statins reduce stroke through a mechanism independent of cholesterol. Other risk factors for stroke include Isolated systolic hypertension in particular. A previous history of DVT may suggest a coagulation disorder. The remaining stems are all associated with increased risk of intracerebral haemorrhage.



[Q: 387] OnExamination -
Emergency medicine

A 76-year-old woman is admitted with right pleuritic chest pain and breathlessness. She had surgery 2 months previously for fracture of right femur following a fall. She has a pyrexia of 38°C. Her CXR shows a little right basal shadowing. Her serum D-dimers are normal at 120.

White cell count is $14 \times 10^9/L$.

What is the most appropriate next step?

- 1- Blood cultures
- 2- Blood gases
- 3- Spiral CT chest
- 4- Start intravenous antibiotics
- 5- Ventilation-perfusion scan

Answer & Comments

Answer: 4- Start intravenous antibiotics

Although it is not specific for PE, normal D-dimers have a high negative predictive potential and would argue very much against there being a thromboembolic event. Thus, the suggestion is that this patient has a chest infection and hence appropriate antibiotic therapy is required. It could be argued that the other options of ABGs and Blood cultures are appropriate answers for this question. But, blood culture yields from chest infection would be low (although they are recommended in patients admitted to hospital) and arguably we could get as much information from sats as from ABGs. Also as both these options are given they kind of cancel each other out as appropriate choices. Therefore, the author of this question probably wants you to be able to differentiate between PE and pneumonia. Thus, the best answer would probably be treat with antibiotics.



[Q: 388] OnExamination -
Emergency medicine

In most cardiac arrest situations 1mg of adrenaline (epinephrine) is given intravenously every 3 minutes.

What is the correct volume and concentration of the adrenaline?

- 1- 0.1ml of 1 in 100
- 2- 1ml of 1 in 1000
- 3- 10ml of 1 in 1000
- 4- 1ml of 1 in 10,000
- 5- 10ml of 1 in 10,000

Answer & Comments

Answer: 5- 10ml of 1 in 10,000

A 1mg dose of adrenaline (epinephrine) would be administered with answers A, B and E. However, 10 ml of 1 in 10,000 is the recommended dose and concentration and is considered the optimum volume of adrenaline during cardiac arrest, and is recommended by the UK Research Council.



[Q: 389] OnExamination -
Emergency medicine

A 22-year-old female is admitted very distressed and short of breath. Examination reveals a respiratory rate of 35/min, a pulse of 120 beats per min, a blood pressure 110/70 mmHg, oxygen saturations of 90% and a Peak Expiratory Flow rate < 50% predicted. The Emergency Medical Services have administered salbutamol 5mg (twice) and face mask oxygen.

Which of the following is the most appropriate next action in this patient?

- 1- Arterial blood gas analysis
- 2- Intensive care referral
- 3- Oxygen 35%
- 4- Prednisolone 40mg

- 5- Salbutamol 5mg and ipratropium bromide 0.5mg

Answer & Comments

Answer: 5- Salbutamol 5mg and ipratropium bromide 0.5mg

According to British Thoracic Society guidelines addition of ipratropium would be the next step in the case of this lady with acute severe asthma. Prednisolone would be administered shortly thereafter. 35% oxygen is inadequate and a maximal concentration should be used. A blood gas is not essential for management particularly with the oxygen saturations of 90% although these will be performed. Intensive care referral may well be appropriate if this lady does not improve.



[Q: 390] OnExamination -
Emergency medicine

A 25-year-old is admitted on the medical intake. She is 10 weeks post partum and has been generally unwell for 2 weeks with malaise sweats and anxiety. On examination she is haemodynamically stable, and clinically euthyroid. TFTs show the following:

Free T₄ 33 pmol/L (9-23)
Free T₃ 8 nmol/L (3.5-6)
TSH <0.02 mU/L (0.5-5)

What is the appropriate management?

- 1- Carbimazole 40mg/day
- 2- Lugol's Iodine
- 3- Propranolol 20mg tds
- 4- Propylthiouracil 50mg/tds
- 5- Radioactive iodine therapy

Answer & Comments

Answer: 3- Propranolol 20mg tds

The diagnosis here is likely to be post partum thyroiditis which tends to occur within the 3 months of delivery followed by a hypothyroid

phase at 3-6 months, followed by spontaneous recovery in one third of cases. In the remaining two-thirds, a single-phase pattern or the reverse occurs. Management is centred on symptomatic treatment using β -blockers for relief of tremor or anxiety, and observation for the development of persistent hypo- or hyperthyroidism.



[Q: 391] OnExamination -
Emergency medicine

A 52 year-old male is admitted with haematemesis and melaena. Examination reveals that he is icteric, confused with a flapping tremor, has signs of chronic liver disease, a pulse rate of 110 bpm and blood pressure of 100/70 mmHg. Abdominal examination reveals ascites. An urgent endoscopy reveals small oesophageal varices, without evidence of bleeding but an oozing portal hypertensive gastropathy.

Which of the following measures would be the most appropriate treatment for this patient?

- 1- endoscopic banding
- 2- endoscopic injection of adrenaline
- 3- endoscopic injection of ethanolamine
- 4- oral propranolol
- 5- intravenous vitamin K

Answer & Comments

Answer: 2- endoscopic injection of adrenaline

The endoscopy shows small varices with no evidence of bleeding but diffuse oozing of blood. Hence endoscopic measures like banding for small varices will not be useful. There is probably no evidence that vit K is helpful as the coagulation is already likely to be deranged. Oral propranolol is useful as a later prophylaxis of variceal bleed.



[Q: 392] OnExamination -
Emergency medicine

An 80-year-old male presented with acute right-sided weakness. Examination revealed minimal right facial weakness, impaired elevation of the right shoulder, with relatively preserved right hand strength. There was global weakness in the right leg which appeared to be maximal in the foot.

Which of the following arteries is most likely to have been affected?

- 1- Anterior cerebral artery
- 2- Lenticulostriate artery
- 3- Middle cerebral artery
- 4- Posterior cerebral artery
- 5- Posterior communicating artery

Answer & Comments

Answer: 1- Anterior cerebral artery

Unilateral occlusion (distal to Ant. Comm. origin) of Anterior Cerebral Artery produces contralateral sensorimotor deficits mainly involving the lower extremity with sparing of face and hands (think of the humunculus).

The Lateral Lenticulostriate artery is a branch of the middle cerebral artery. Occlusion causes damage to the internal capsule resulting in contralateral hemiparesis and sensory deficit. Speech may be affected (medial temporal lobe) as well as visual function (Meyer's loop: optic radiations affected).

Middle Cerebral Artery: Occlusion at the stem (proximal segment) results in:

- " Contralateral hemiplegia affecting face, arm, and leg (lesser).
- " Homonymous hemianopia - Ipsilateral head/eye deviation.
- " If on left: global aphasia.

Posterior cerebral artery: A variety of neurological syndromes including:-

- " Pure hemisensory loss
- " visual field loss- a variety
- " Visual agnosia
- " Disorders of reading (alexia, dyslexia) and more.....



[Q: 393] OnExamination -
Emergency medicine

Which of the following reactions is involved in the metabolism of paracetamol under normal conditions?

- 1- cytochrome p450 dependent oxidation
- 2- hydrolysis
- 3- conjugation to glucuronic acid
- 4- conjugation to glutathione
- 5- acetylation

Answer & Comments

Answer: 3- conjugation to glucuronic acid

Paracetamol is conjugated to glucuronic acid and sulphate under normal conditions. In overdose these processes become saturated and the drug is then conjugated with glutathione. If the glutathione supply is depleted then a toxic metabolite is formed.



[Q: 394] OnExamination -
Emergency medicine

Which of the following percentages most accurately reflects the mortality associated with the modern management of diabetic ketoacidosis?

- 1- 0.5%
- 2- 1%
- 3- 2-3%
- 4- 5-6%
- 5- 8-10%

Answer & Comments

Answer: 3- 2-3%

Despite the advances in the management of diabetes in general and the improvements in intensive care, studies reveal that the mortality associated with diabetic ketoacidosis remains stubbornly around the 2-5% since the 1970s. Specifically mortality relates to cerebral oedema.



[Q: 395] OnExamination -
Emergency medicine

A 17-year-old girl presents after having ingested fifty of her mother's Fluoxetine tablets, approximately 5 hours previously.

Which one of the following clinical features is compatible with this history?

- 1- Pupillary constriction
- 2- heart rate of 60 beats per minute
- 3- QRS duration of 120 ms (<100)
- 4- respiratory rate of six breaths per minute
- 5- convulsions

Answer & Comments

Answer: 2- heart rate of 60 beats per minute

Unlike the Tricyclic antidepressants, Fluoxetine like many of the SSRIs are safe in overdose causing very few effects. Rarely, reports would suggest that tachycardia can occur together with tremor, drowsiness, nausea and vomiting. Thus, this is a bit of a trick question as normal observations would be expected and so, a heart rate of 60 beats per minute is compatible with the patient having taken an overdose of Prozac. Pupillary constriction suggests opiates as does respiratory depression with prolonged QRS with TCAs.



[Q: 396] OnExamination -
Emergency medicine

A 22-year-old male is admitted wheezing with a respiratory rate of 35/min, a pulse of 120 beats per min, blood pressure 110/70 mmHG, Peak Expiratory Flow rate < 50% predicted. The Emergency Medical Services have administered salbutamol 5mg (twice), Ipratropium 0.5mg and face mask oxygen. His arterial blood gas reveals:

pH 7.42 (7.35-7.45)

paCO₂ 5.0 kPa (4.5-5.9)

paO₂ 22 kPa (10.5-13.2kPa)

Base excess -2

SpO₂ 98

Which of the following is the most appropriate action for this man?

- 1- Chest X-ray
- 2- Intensive care referral
- 3- Ipratropium
- 4- Magnesium 1-2 g
- 5- Oxygen 35 %

Answer & Comments

Answer: 2- Intensive care referral

In this case the patient is showing signs of respiratory decompensation. A normal or raised PaCO₂ in an asthmatic is a warning of impending respiratory failure as the patient becomes too tired to ventilate adequately and ITU need to be notified. Administration of magnesium would be the next therapeutic measure. A chest x-ray will be helpful but should not delay in treatment and referral. 35 % oxygen is inadequate.



[Q: 397] OnExamination -
Emergency medicine

A 70-year-old male presents with haematemesis and malaena. His presenting blood pressure is 80/46 mmHg, with a heart

rate of 114 bpm. He is known to have idiopathic cirrhosis, and there is mild encephalopathy. You fluid resuscitate him with colloid, blood, FFP and dextrose.

Which of the following is the next best step in management?

- 1- Ciproflaxacin
- 2- Oral beta-blockers
- 3- OGD
- 4- Glypressin
- 5- Lactulose

Answer & Comments

Answer: 4- Glypressin

Glypressin causes splanchnic vasoconstriction thereby restricting bleeding from varices, which is the likely cause of bleeding in this patient. In the acute GI bleed described above, glypressin is the best treatment to aid cardiovascular resuscitation. Beta-blockade comes into play later in order to treat portal hypertension chronically. Lactulose should be considered to guard against progression of encephalopathy. OGD should be considered, but full resuscitation and optimal medical management should be attempted in the first instance. In the event of ascites, ciprofloxacin is used as prophylaxis against spontaneous bacterial peritonitis. This is of secondary importance here.



[Q: 398] OnExamination -
Emergency medicine

A 63-year-old female presents with a one day history of confusion with headaches. On examination she is confused, with a Glasgow Coma Scale of 13 and a temperature of 39.5°C. She has nuchal rigidity and photophobia. CSF examination reveals a glucose of 0.5 mmol/l, a white cell count of 2500 per mm and Gram positive Cocci in pairs.

Which of the following is correct?

- 1- The most likely infective organism is *Staphylococcus aureus*
- 2- The organism is likely to be penicillin resistant.
- 3- Rifampicin should be given to close contacts.
- 4- Nerve deafness would be a common complication in this case.
- 5- A characteristic rash would be expected.

Answer & Comments

Answer: 4- Nerve deafness would be a common complication in this case.

This patient has pneumococcal meningitis, caused by the Gram positive coccus *Strep Pneumonia*. This is the second commonest cause of bacterial meningitis (commonest in the elderly) and is associated with the highest mortality (20%) and highest morbidity, such as deafness which may occur in 50%. Contacts do not require treatment and there is no rash associated with pneumococcal meningitis. *Meningococcus* is gram negative.



[Q: 399] OnExamination -
Emergency medicine

Which of the following features would be expected in acute tubular necrosis?

- 1- Heavy proteinuria on urinalysis
- 2- Red cell casts on urinalysis
- 3- Urine plasma osmolality ratio is more than 1:1
- 4- Urinary sodium concentration greater than 30 mmol/l
- 5- Creatinine clearance would be expected to be normal 1 year after the initial insult.

Answer & Comments

Answer: 4- Urinary sodium concentration greater than 30 mmol/l

Proteinuria usually mild is common with granular casts found on urinalysis. The urine sodium concentration is typically above 30 mmol/l and osmolality ratio <1:1. Red cell casts suggest nephritis and normalisation of the creatinine clearance occurs in only 40% of cases one year later.



[Q: 400] OnExamination -
Emergency medicine

A 24-year-old man presents to the Accident & Emergency department and complains of shortness of breath. Before his Chest X-ray is taken he tells the casualty officer that he is known to have an 'azygous lobe'.

What region of the Chest X-ray would expect to see an 'azygous lobe'?

- 1- left lower zone
- 2- left mid zone
- 3- left upper zone
- 4- right lower zone
- 5- right upper zone

Answer & Comments

Answer: 5- right upper zone

An azygous lobe is seen in about 0.5% of routine Chest X-rays and is a normal variant. It is seen as a 'reverse comma sign' behind the medial end of the right clavicle.



[Q: 401] OnExamination -
Emergency medicine

In malignant hyperpyrexia:

- 1- A mortality rate of 20% may be expected
- 2- Elevation of serum creatine kinase and myoglobinuria is diagnostic
- 3- Muscle biopsy may be histologically normal
- 4- The only available specific treatment is sodium dantrolene, which has a neutral pH
- 5- The predisposing gene is thought to be on chromosome 9

Answer & Comments

Answer: 3- Muscle biopsy may be histologically normal

Malignant hyperpyrexia (MH) is characterised by increased temperature and muscle rigidity during anaesthesia, which results from abnormal skeletal muscle contraction and increased metabolism. The predisposing gene is thought to be on chromosome 19, close to the gene for the ryanodine / dihydropyridine receptor complex. Known triggering agents include the volatile anaesthetic agents and suxamethonium. Patients show different sensitivity to the triggering agents and the reaction can be delayed by several hours. Intravenous dantrolene (up to 10mg/Kg) is the only available specific treatment. The solution has a pH of 9 to 10. The prognosis is good when the appropriate treatment is instigated early, mortality being <5% (prior to dantrolene the mortality was 80%). Serum creatine kinase elevation and myoglobinuria are suggestive but not diagnostic of MH. Myoglobin and creatine kinase are both known to increase after giving suxamethonium to normal patients. Contracture tests using caffeine and halothane are the investigations of choice. Muscle biopsies may appear histologically normal.



[Q: 402] OnExamination -
Emergency medicine

A 17-year-old woman presented 6 hours after taking 30g of Paracetamol.

Which of the following factors is most likely to predict an increased risk of hepatotoxicity from the Paracetamol?

- 1- Anorexia nervosa
- 2- Consumption of 20 units of alcohol since taking the Paracetamol
- 3- Gilbert's disease
- 4- Ingestion of Amitriptyline with the Paracetamol

5- Smoking 20 cigarettes per day

Answer & Comments

Answer: 1- Anorexia nervosa

High risk groups in paracetamol overdose include malnourished patients (anorexia nervosa/bulimia nervosa), patients taking enzyme inducing drugs (eg carbamazepine, phenytoin rifampicin and St John's Wort), patients with induced liver enzymes due to chronic ethanol abuse and HIV positive patients. See review in Clinical Medicine Vol 3 No 2 2003.



[Q: 403] OnExamination -
Emergency medicine

A 30-year-old man presents to the Accident and Emergency Department with a history of drug overdose. He is known to be repeatedly admitted with similar episodes of self-harm. On this occasion he is drowsy and has prominent hypersalivation.

Which of the following agents, found on his person, is the likely cause?

- 1- Chlormethiazole
- 2- Cocaine
- 3- Dosulepin
- 4- L-dopa
- 5- Solvent cannister

Answer & Comments

Answer: 1- Chlormethiazole

Hypersalivation is seen with parasympathomimetic agents, insecticides, arsenic, strychnine, chlormethiazole and clozapine and others. Solvent abuse may cause an acneiform rash around the buccal cavity. Cocaine abuse leads to hypertension and nasal septum perforation. The other agents are anticholinergic and would cause dry mouth in overdose.



[Q: 404] OnExamination -
Emergency medicine

A 27-year-old lady collapses in the Emergency Room after being admitted with numerous seizures. You obtain information from her husband that she has a past history of seizures but has not had any of the last two years and is well controlled on valproate. He also informs you that she has been gaining weight recently and has also had erratic menses which the neurology clinic attribute to the valproate.

Her pulse is 110/min, blood pressure is 160/90 mmHg and her urinalysis reveals 3+ proteinuria.

After Airway, Breathing and circulation, the immediate drug therapy should be:

- 1- Diazepam 10mg
- 2- Lorazepam 2mg
- 3- Magnesium 2 grams
- 4- Nil
- 5- Phenytoin 1000mg

Answer & Comments

Answer: 3- Magnesium 2 grams

This lady may well be having an epileptic fit, but why should a young woman have an elevated BP and proteinuria? In a woman of this age with raised blood pressure and proteinuria, a diagnosis of eclampsia has to be considered and the primary treatment of eclampsia is the administration of magnesium.



[Q: 405] OnExamination -
Emergency medicine

An 18 year-old woman presents thirty hours after taking about 50 Paracetamol tablets (25g).

Which of the following tests measured at this time point would be most helpful in determining the outcome?

- 1- ALT concentration

- 2- Bilirubin concentration
- 3- Creatinine concentration
- 4- Paracetamol concentration
- 5- prothrombin time

Answer & Comments

Answer: 1- ALT concentration

The patient has ingested a seriously toxic dose of paracetamol. The best determinant of this risk at thirty hours would be ALT indicating hepatic damage which would be expected prior to alteration in prothrombin time. Paracetamol concentrations would be rather meaningless at this time point and irrespective she would be treated with activated charcoal and N-acetylcysteine.

There are four phases of paracetamol overdose

* Phase 1 (0-24 h) o Asymptomatic o Anorexia o Nausea or vomiting o Malaise o Subclinical rise in serum AST - 12 hours postingestion

* Phase 2 (18-72 h) o Right upper quadrant abdominal pain, anorexia, nausea, vomiting o Continued rise in serum transaminases levels (note this is the time slot for our patient with the ALT rises)

* Phase 3 (72-96 h) o Centrilobular hepatic necrosis with continued abdominal pain o Jaundice o Coagulopathy o Hepatic encephalopathy o Nausea and vomiting o Renal failure o Fatality Rising INR/PT from 3 days.

* Phase 4 (4 d to 3 wk) o Complete resolution of symptoms o Complete resolution of organ failure



[Q: 406] OnExamination -
Emergency medicine

These are the blood gas results obtained from a 20-year-old female admitted to hospital.

hydrogen ion concentration 35 nmol/L (35-45)

pH 7.45 (7.35-7.45)
 pCO₂ 6.8 kPa (4.6-5.9)
 bicarbonate 32 mmol/L (22 - 26)

Which of the following is the most likely cause of this patient's acid-base derangement?

- 1- Amitriptyline overdose
- 2- Cushing's syndrome
- 3- Hepatic failure
- 4- Pregnancy
- 5- Salicylate poisoning

Answer & Comments

Answer: 4- Pregnancy

This patient has a mild metabolic alkalosis with what appears to be respiratory compensation as reflected by the elevated pCO₂. Amitriptyline overdose is associated with acidosis as is salicylate poisoning. Hepatic failure usually presents with acidosis. This type of picture is associated with prolonged vomiting (as in pregnancy), diarrhoea, diuretic therapy and in Cushing's syndrome or in those receiving high dose corticosteroids. With no other information provided for this case, common things being common, one should select pregnancy as the best answer for a 20-year-old female.



[Q: 407] OnExamination -
Emergency medicine

An 18-year-old female presents with an acute exacerbation of asthma associated with a chest infection. She is unable to complete a sentence and her peak flow rate was 35% of her normal level. She is treated with high flow oxygen, nebulised bronchodilators and oral steroids but this is associated with little change in her condition.

Which of the following treatments, given intravenously, would be the most appropriate for this patient?

- 1- Aminophylline

- 2- Augmentin
- 3- Hydrocortisone
- 4- Magnesium
- 5- Salbutamol

Answer & Comments

Answer: 4- Magnesium

This patient has acute severe asthma (PEFR 33-50% predicted/best, unable to complete sentences in one breath, respiratory rate > 25 breaths/min, pulse rate > 110 beats/minute). She has not responded to initial treatment and the treatment of choice now is intravenous magnesium 1.2-2g over 20 minutes. [see: BTS guidelines on the Management of Asthma . Thorax 2003;58 (suppl 1). OR www.sign.ac.uk]



[Q: 408] OnExamination -
Emergency medicine

A 52-year-old woman presents with left loin pain. Past history included hypertension and progressive cognitive decline. On examination she was pyrexial, had livedo reticularis and a blood pressure of 180/100 mmHg.

Examination of the abdomen revealed no masses but there was tenderness in the left flank.

Investigations revealed:

haemoglobin 12.9 g/dL (11.5-16.5)
 white cell count $8.7 \times 10^9/L$ (4-11)
 platelet count $83 \times 10^9/L$ (150-400)
 serum creatinine 106 $\mu\text{mol/L}$ (60-110)
 urine dipstick analysis:
 " blood+++
 " protein+

Which one of the following tests is most likely to be positive?

- 1- anticardiolipin antibody

- 2- antiglomerular basement membrane antibody
- 3- antimitochondrial antibody
- 4- antineutrophil cytoplasmic antibody
- 5- antistreptolysin O antibody

Answer & Comments

Answer: 1- anticardiolipin antibody

This patient has features of to suggest SLE with antiphospholipid syndrome with this presentation possibly due to renal vein thrombosis (flank pain with blood and protein in urine). The diagnosis would be supported by the thrombocytopaenia, history of hypertension and the livedo reticularis. Wegner's with positive ANCA would be a less likely diagnosis. Read more about antiphospholipid syndrome.



[Q: 409] OnExamination -
Emergency medicine

A 58-year-old man presents with a month history of breathlessness. He was a non-smoker. On examination, his temperature was 36.7°C, with a respiratory rate of 20 breaths per minute and normal breath sounds to auscultation and a pulse of 92 bpm. Arterial blood gases on air showed:

pH 7.51 (7.36 - 7.44)

pO₂ 8.4 kPa (11.3 - 12.6)

pCO₂ 4.0 kPa (4.7 - 6.0)

What is the most likely diagnosis?

- 1- atypical pneumonia
- 2- fibrosing alveolitis
- 3- hysterical hyperventilation
- 4- inhaled foreign body
- 5- pulmonary thromboembolism

Answer & Comments

Answer: 5- pulmonary thromboembolism

This patient has a respiratory alkalosis with type 1 respiratory failure as evidenced by low pO₂ and low pCO₂. Chronic venous thromboembolism would be the most likely explanation for this man's presentation. Hyperventilation would be excluded by the type 1 respiratory failure, an inhaled foreign body would not produce such a picture and an atypical pneumonia would be associated with pyrexia and some clinical signs. The differential diagnosis here is pulmonary fibrosis but basal crackles may be expected and the history is somewhat short.



[Q: 410] OnExamination -
Emergency medicine

A 17-year-old male presents to A+E after an overdose of alcohol and paracetamol. He complained of abdominal discomfort and an intravenous infusion of N-Acetylcysteine was commenced. *15 minutes later he developed breathlessness, reported feeling flushed and developed a tachycardia.*

- 1- A disulfiram-like (antabuse) reaction has occurred
- 2- The patient has had a panic attack
- 3- The patient has developed pulmonary oedema
- 4- The patient has received an overdose of N-Acetylcysteine
- 5- The patient has received N-Acetylcysteine previously

Answer & Comments

Answer: 5- The patient has received N-Acetylcysteine previously

This patient is having an acute hypersensitivity reaction the most common, dose independent adverse drug reaction. It is caused by previous exposure and being sensitised to the drug. The initial exposure induces the production of antibodies of Ig E class, subsequent exposure induces an immunological reaction

hypoxylaxis. Some drugs can produce an similar pseudoallergic reaction on first exposure.



[Q: 411] OnExamination -
Emergency medicine

A 19-year-old woman became breathless while travelling on an aeroplane.

Which one of the following features most strongly supports a diagnosis of acute hyperventilation related to a panic disorder?

- 1- Carpal spasm.
- 2- Finger paraesthesiae.
- 3- Hypotension.
- 4- Light-headedness.
- 5- Loss of consciousness

Answer & Comments

Answer: 1- Carpal spasm.

We need to distinguish between the signs that may be expected in the tachypnoea associated with the hypoxia from a PE or any other serious respiratory problem and the hyperventilation with increased pO₂ in a panic attack. A carpal spasm would be most likely to reflect this. Finger paraesthesiae can occur with PE, as can hypotension, light-headedness and loss of consciousness. Carpal spasm is found in association with hyperventilation due to the respiratory alkalosis which results in a reduction in ionised calcium concentration.



[Q: 412] OnExamination -
Emergency medicine

A 28-year-old female, three days post-partum develops severe headache associated with seizures. During her pregnancy her blood pressure had been mildly elevated in the third trimester. On examination, she had a GCS of 15 but was slightly confused and drowsy. Her temperature was 37.5°C, she had mild nuchal

rigidity but neurological examination was otherwise normal.

What is the most likely diagnosis?

- 1- Bacterial meningitis
- 2- Cortical vein thrombosis
- 3- Eclampsia
- 4- Intracerebral haemorrhage
- 5- Subarachnoid haemorrhage

Answer & Comments

Answer: 2- Cortical vein thrombosis

Post-partum period is a risk factor of cortical vein and sinus thrombosis. It typically presents with headache, seizures and focal neurological deficit 2-3 weeks postpartum (but is also seen earlier). Other clinical presentations include a BIH type of picture (papilloedema, visual disturbances and headaches) or a subacute encephalopathic picture. Thrombophilia screen should be performed. Eclampsia typically improves following delivery. The seizures can occur prepartum, intrapartum, or postpartum. If the seizure occurs postpartum, it usually occurs within the first 24 hours after delivery.



[Q: 413] OnExamination -
Emergency medicine

A 78-year-old male is brought to A+E and has a witnessed seizure in the resuscitation room. His blood glucose is recorded as 1.0mmol/l. He is not diabetic, and has no other significant past medical history. He is given 50ml of 50% dextrose and he slowly recovers over the next 1 hour. A serum cortisol concentration later returns as 800nmol/l (120-600).

Which of the following would be the most relevant investigation for this man?

- 1- Chest x-ray
- 2- CT head scan
- 3- Electrocardiogram

4- Prolonged 72 hour fast

5- Short synacthen test

Answer & Comments

Answer: 4- Prolonged 72 hour fast

The historical and biochemical evidence here suggests a diagnosis of spontaneous hypoglycaemia and the most likely cause would be an insulinoma. However, one would wish to exclude possible drug administration and although not mentioned here, a sulphonylurea screen should be undertaken. He has presented with symptomatic hypoglycaemia, is not diabetic therefore should not have received insulin or a sulphonylurea. There is nothing to suggest alcohol or drug misuse. Similarly, there is nothing to suggest sepsis. However, to prove a diagnosis of spontaneous hypoglycaemia a prolonged fast is required and should be develop hypoglycaemia, measurement of insulin and C-peptide will be needed to confirm the diagnosis. The appropriate cortisol response during his hypoglycaemic episode (cortisol 800) excludes hypoadrenalism.



[Q: 414] OnExamination -
Emergency medicine

A 30-year-old man is admitted three hours after taking an overdose of amitriptyline and diazepam. On examination he was drowsy with a Glasgow Coma Scale of 8, he had a pulse of 140 beats per minute, a blood pressure of 114/88 mmHg and dilated pupils. His oxygen saturation was 90% on room air.

What is the most appropriate initial action for this patient?

- 1- activated charcoal
- 2- CT head scan
- 3- ECG
- 4- IV atenolol
- 5- IV flumazenil

Answer & Comments

Answer: 3- ECG

Daft question really. The most appropriate initial action would be to get the investigations done as quickly as possible ?arterial blood gases and ECG as the latter may show QRS widening and merit treatment. Then, the next step would be gastric decontamination with lavage and activated charcoal. Treatment with bicarbonate is also advocated as this patient displays features of severe TCA overdose. He doesn't need a CT scan as the symptoms are typical of tricyclic overdose. Flumazenil is not appropriate for this patient as the symptoms are mostly of TCA overdose nor is IV atenolol appropriate for the arrhythmias ?bretylium, phenytoin or lidocaine.



[Q: 415] OnExamination -
Emergency medicine

A 41-year-old female is brought into A&E after taking an uncertain quantity of paracetamol two hours previously and trying to hang herself. She becomes agitated and insists that she wants to go home immediately. You judge that she is at high risk of suicide.

Which of the following is the most appropriate course of action for this patient?

- 1- Call the duty psychiatrist, and with other staff in the A&E department attempt to restrain her under Common Law until they arrive.
- 2- Ask her to sign a 'discharge against medical advice' form and let her go.
- 3- Call the duty psychiatrist, but let the patient go if she insists and the duty psychiatrist does not arrive in time to see her.
- 4- Detain her under section 5(2) of the Mental Health Act.
- 5- Call the hospital security services, restrain her and sedate her.

Answer & Comments

Answer: 1- Call the duty psychiatrist, and with other staff in the A&E department attempt to restrain her under Common Law until they arrive.

In an A&E department the suicidal patient who declines to be admitted for observation and treatment should be managed as follows:

- Ensure that a member of staff stays with them at all times
- Call the duty psychiatrist
- If they attempt to abscond before or during psychiatric assessment, the staff of the A&E department have a duty under Common Law to restrain the patient. If a patient who is already being nursed on medical, surgical or obstetric ward, or in a high dependency or intensive care unit, develops a mental illness (or has an exacerbation of a pre-existing disorder), their physician or surgeon can authorise their compulsory detention for up to 72 hours under section 5(2) of the Mental Health Act.



[Q: 416] OnExamination -
Emergency medicine

A 65-year-old man is admitted from home with a community acquired pneumonia. He has a history of skin rash to Penicillin documented in his medical notes. He has adverse prognostic features and a CURB score of 4.

What would be an appropriate empirical antibiotic choice?

- 1- Augmentin and Clarithromycin
- 2- Augmentin and Gentamycin
- 3- Cefotaxime and Erythromycin
- 4- Cefuroxime and Metronidazole
- 5- Ciprofloxacin and Clarithromycin

Answer & Comments

Answer: 3- Cefotaxime and Erythromycin

Community acquired pneumonia is most commonly caused by strep pneumonia, hence, the use of a beta lactam antibiotic because of the increased incidence of atypical organismc such as mycoplasma. A macrolide such as Erythromycin is also recommended. Augmentin is contraindicated as it is Penicillin based. Ciprofloxacin has poor cover against strep pneumonia and Metronidazole is used for anaerobic infections.

The issue of cross-reactivity of hypersensitivity reactions between beta-lactam antibiotics is a concern and isn't fully addressed in the British Thoracic Society guidelines for CAP of 2001 or the update in 2004 for severe hospitalised CAP. They state that alternatives would be a macrolide for non-severe CAP or levofloxacin or possibly moxifloxacin (but in combination with benzylpenicillin in severe cases). The difficulty with the BTS guidelines is that a lot of the available evidence is of a very low level such as consensus view rather than randomised controlled trials. An interesting article in the NEJM discusses more generally the topic of cephalosporin cross-reactivity. NEJM 2001;345(11):804-809.

In this case a credible alternative for beta-lactam sensitivity is not mentioned and the best choice, because of clinical necessity since severe pneumonia can be fatal if treated with antibiotics that are not effective, is to go with the only cephalosporin and macrolide combination that is offered.



[Q: 417] OnExamination -
Emergency medicine

A 54-year old woman was admitted with acute breathlessness. On examination she had a temperature of 37°C, a respiratory rate of 32 breaths per minute, a pulse of 120 beats per minute, a blood pressure of 100/60 mmHg, and a peak expiratory flow rate of 250 litres per minute. Auscultation of the heart and chest was normal. The Chest X-ray was normal and blood gases on air showed:

pH 7.35 (7.36 - 7.44)
 PaO₂ 6.0kPa (11.3 - 12.6)
 PaCO₂ 3.9 kPa (4.7 - 6.0)
 Serum bicarbonate 20 mmol/l (20 - 28)
 She was started on high flow oxygen.

What is the most important next treatment?

- 1- amoxicillin intravenously
- 2- aminophylline intravenously
- 3- intravenous fluids
- 4- low molecular weight heparin
- 5- nebulised salbutamol

Answer & Comments

Answer: 4- low molecular weight heparin

This patient has features of a Type 1 respiratory failure with mixed acid-base disturbances. The differential diagnosis here lies between PE and acute severe asthma. On the basis of the reasonable PEFR of 250, the tachycardia and hypotension, PE seems the most likely explanation and LMWH would be the treatment of choice.

IV fluids are potentially harmful since the cause of the shock is an obstructed right ventricle. Fluids may dilate the ventricle further and reduce cardiac output. There is a role for fluids in those patients with rapidly falling BP but this should preferably be done (if there is time) with central pressure monitoring.



[Q: 418] OnExamination -
Emergency medicine

A 50-year-old male presented with acute respiratory failure during an episode of acute pancreatitis and was thought to have developed adult respiratory distress syndrome (ARDS).

Which of the following would support a diagnosis of ARDS?

- 1- High pulmonary capillary wedge pressure
- 2- High protein pulmonary oedema
- 3- Hypercapnia
- 4- Increased lung compliance
- 5- Normal chest X-ray

Answer & Comments

Answer: 2- High protein pulmonary oedema

ARDS is characterised by hypoxaemia, reduced lung compliance, pulmonary hypertension and pulmonary infiltrates on the chest X-ray. There is damage to the capillary and endothelial cell linings resulting in oedema and leakage of proteins and cells into the interstitial and alveolar spaces at normal pulmonary capillary hydrostatic pressures. Wedge pressure unlike the high pressures seen with LVF and pulmonary oedema is often normal. Hypercapnia often a late feature of ARDS does not distinguish from any other cause of type 2 respiratory failure.



[Q: 419] OnExamination -
Emergency medicine

A 52-year-old schoolteacher attends with weight loss and sweats. She is clinically thyrotoxic with a diffuse goitre. Subsequent investigations show:

Free T₄ 40 pmol/L (9-23)
 Free T₃ 9.8 nmol/L (3.5-6)
 TSH 6.1 mU/L (0.5-5)

A repeat TFT is similar.

What is the most appropriate investigation for this patient?

- 1- FNA of thyroid gland
- 2- MRI scan pituitary gland
- 3- Radio-isotope uptake scan of thyroid gland
- 4- Repeat TFT checking for antibody interference
- 5- Thyroid auto antibodies

Answer & Comments

Answer: 2- MRI scan pituitary gland

This patient is thyrotoxic, however the non suppressed TSH suggests that this is due to excessive TSH production by the pituitary gland the possibility of a Thyrotroph adenoma must be pursued. In primary hyperthyroidism the TSH should always suppressed by negative feedback, which is NOT the case here. TSHomas are indeed very rare but the giveaway would be the normal or elevated TSH with thyrotoxicosis.



[Q: 420] OnExamination -
Emergency medicine

A 53-year-old man with a known history of Grave's disease presents to the Emergency department with palpitations, anxiety and fine tremor of both hands. ECG shows rapid atrial fibrillation with ventricular rate of 160 to 180/min. His blood pressure was 110/80 mmHg. TSH was 0.01 mIU/L (N0.17-4.2) and Free T₄ 60.3 pmol/L (N13-23).

What is the immediate management for this patient?

- 1- Carbimazole
- 2- DC cardioversion
- 3- Digoxin
- 4- Propranolol
- 5- Warfarin

Answer & Comments

Answer: 4- Propranolol

AF occurs in 10% to 25% of patients with hyperthyroidism, more commonly in men and the elderly than in women or patients less than 75 years old. In a patient with hyperthyroidism and AF, initial therapy should focus on ventricular rate control with β blockers but conversion to sinus rhythm frequently occurs spontaneously with treatment of hyperthyroidism. AF in

thyrotoxicosis is characterized by rapid ventricular response, typically resistant to Digoxin therapy. Electric or pharmacologic cardioversion should be attempted only in euthyroid patients who are haemodynamically unstable. If AF persists, consideration should be given to anticoagulation in patients who are at risk of embolic events.



[Q: 421] OnExamination -
Emergency medicine

A 16-year-old girl with obesity was referred with abdominal swelling and mild ankle oedema. On examination the blood pressure was 140/90 mmHg. Investigations revealed: Haemoglobin 10.5g/dL (11.5-16.5), Serum biochemistry normal, Serum albumin 34 g/L (37-49), Urine dipstick proteinuria +

Which is the most appropriate investigation that you would request next for this patient?

- 1- 24 hour urinary protein estimation.
- 2- Abdominal ultrasound.
- 3- Plasma protein electrophoresis.
- 4- Urinary albumin: creatinine ratio.
- 5- Urinary B-human chorionic gonadotrophin test (B-HCG)

Answer & Comments

Answer: 5- Urinary B-human chorionic gonadotrophin test (B-HCG)

This young girl has been 'gaining weight', has abdominal swelling and ankle oedema. She is hypertensive and has a mild anaemia with proteinuria. These signs should 'ring a bell' suggesting a concealed pregnancy with pre-eclampsia. The most relevant investigation would be a pregnancy test ?urinary B-HCG.



[Q: 422] OnExamination -
Emergency medicine

A 45-year-old male with a long history of alcohol abuse presents with a two day history

of deteriorating confusion. On examination he is drowsy, has a temperature of 39°C, a pulse of 110 beats per minute, a small amount of ascites and has features of a left side hemiparesis.

What is the most likely diagnosis?

- 1- Cerebral abscess
- 2- Cerebro-vascular accident
- 3- Hepatic encephalopathy
- 4- Wernicke's encephalopathy
- 5- Sub-dural haematoma

Answer & Comments

Answer: 1- Cerebral abscess

This man with chronic alcohol abuse now presents with a fever and left hemiparesis. The most likely diagnosis would therefore be cerebral abscess. The fever would not itself be explained by a subdural haematoma nor would a simple CVA explain this. Similarly, delirium tremens or encephalopathy would not be associated with the hemiparesis.



[Q: 423] OnExamination -
Emergency medicine

A 54-year-old male with Child's grade C hepatic encephalopathy presents with haemetemesis.

Which of the following is the most appropriate immediate therapy?

- 1- IV Desmopressin
- 2- IV Isoket
- 3- IV Omeprazole
- 4- IV Propranolol
- 5- IV Somatostatin

Answer & Comments

Answer: 5- IV Somatostatin

The answer here is octreotide/Somatostatin. Nitrates are never used as monotherapy but

used in conjunction with vasopressin not desmopressin. Propranolol is used only as prophylaxis and not in an emergency. Omeprazole is useful only in peptic ulcerations.



[Q: 424] OnExamination -
Emergency medicine

A 19-year-old female type 1 diabetic is admitted with diabetic ketoacidosis.

Which of the following is most appropriate concerning the use of a bicarbonate infusion?

- 1- No benefit from using a bicarbonate infusion.
- 2- Commence a bicarbonate infusion at pH less than 7.
- 3- Commence a bicarbonate infusion with a standard bicarbonate concentration below 5 mmol/l (NR 22-26).
- 4- Commence bicarbonate infusion with a potassium concentration above 6 mmol/l.
- 5- Commence a bicarbonate infusion with a ketone concentration above 5 mmol/l (NR less than 1)

Answer & Comments

Answer: 2- Commence a bicarbonate infusion at pH less than 7.

The use of bicarbonate in DKA is controversial. However, most authorities agree that a bicarbonate infusion may be used in subjects with a severe metabolic acidosis (pH less than 7).



[Q: 425] OnExamination -
Emergency medicine

A 42-year-old female presents following an episode of confusion associated with vomiting and abdominal pain. She had a one month history of weight loss and receives thyroxine for hypothyroidism which was diagnosed five years ago. On examination she appeared

unwell, with a temperature of 37.5°C and her blood pressure was 100/50 mmHg. Investigations revealed:

sodium	130 mmol/L (137-144)
potassium	4.8 mmol/L (3.5-4.9)
urea	7.6 mmol/L (2.5-7.5)
glucose	2.7 mmol/L (3.0-6.0)
freeT4	9 pmol/l (10-22)
TSH	1 mu/l (0.5-5)

Which one of the following given intravenously would be the most appropriate initial management?

- 1- Cefuroxime
- 2- 10% Dextrose infusion
- 3- Glucagon
- 4- Hydrocortisone
- 5- Tri-iodothyronine

Answer & Comments

Answer: 4- Hydrocortisone

This young female presents with classical features of Addison's disease and the most appropriate and life-saving therapy is steroids given intravenously. The abnormal TFTs are often encountered in association with acute hypoadrenalism. Giving thyroxine may actually exacerbate the condition.



[Q: 426] OnExamination -
Emergency medicine

A 31-year-old female with pulmonary hypertension complains of increasing shortness of breath. She is 36 weeks gestation in her first pregnancy.

Which of the following statements is correct?

- 1- Chest X-ray is contraindicated
- 2- Elevated D-dimers rule out PE
- 3- Enoxaparin dose should be halved in pregnancy

- 4- Nifedipine is contraindicated in pregnancy
- 5- Risk of maternal mortality in patients with pulmonary hypertension is 30%

Answer & Comments

Answer: 5- Risk of maternal mortality in patients with pulmonary hypertension is 30%

A chest X-ray is not contraindicated in pregnancy. Any pregnant female presenting with shortness of breath should be reviewed by a senior member of the obstetric team, advice which comes from the RCOG. Enoxaparin dose should be doubled in pregnancy, due to the increased GFR in pregnancy. D-dimers are always elevated in pregnancy, and are not helpful as a diagnostic aid, unless of course they are low (very unlikely), thereby making the clinical suspicion of PE low. Nifedipine is not contraindicated in pregnancy, but should be used judiciously. Labetalol and Methyldopa are the commonest antihypertensives used in pregnancy. Patients with pulmonary hypertension have a high mortality of at least 30% - some authors put it at 50% - seemingly highest immediately after delivery.



[Q: 427] OnExamination -
Emergency medicine

A patient has just received intravenous ceftazidime. They immediately become flushed and wheezy, with a blood pressure of 80/40 mmHg.

Which of the following is the most appropriate immediate management for this patient?

- 1- Chlorphenamine 10mg IV
- 2- Epinephrine 0.2mls of 1:1000 IV
- 3- Epinephrine 0.5mg IV
- 4- Epinephrine 0.5mg i.m.
- 5- Hydrocortisone 100mg i.v.

Answer & Comments

Answer: 4- Epinephrine 0.5mg i.m.

Immediate treatment of anaphylaxis includes cessation of whatever caused it. Oxygen, fluids and adrenaline/epinephrine 0.5mg i.m or subcutaneously. (checking concentrations of adrenaline is very important especially in high pressure situations). Intravenous adrenaline is potentially hazardous unless diluted appropriately.



[Q: 428] OnExamination -
Emergency medicine

A 76-year-old with a recent history of cerebral haemorrhage is admitted with a cough, worsening breathlessness and right pleuritic chest pain. He is also mildly pyrexial. His ventilation-perfusion scan reveals several areas of ventilation/perfusion mismatches in the right lower zone.

What is the most appropriate line of management?

- 1- aspirin therapy
- 2- antibiotics
- 3- inferior vena cava filter
- 4- low molecular weight heparin treatment
- 5- warfarin treatment

Answer & Comments

Answer: 3- inferior vena cava filter

This patient has PE following a recent haemorrhagic stroke. The risk of rebleeding into the stroke area is too high with anticoagulation. The best action would be percutaneous insertion of IVC filter which may be as effective as anticoagulation. It is used in cases where anticoagulation is a contraindication or in those in whom anticoagulation alone fails.



[Q: 429] OnExamination -
Emergency medicine

A 17-year-old girl presents following an overdose of Paracetamol, her parents having found her with empty packets of paracetamol. She states that she has taken 100 tablets, three hours earlier.

Which is the most appropriate step in this patient's management?

- 1- administer oral activated Charcoal 50g
- 2- give N-Acetylcysteine intravenously
- 3- Measure plasma Paracetamol concentration
- 4- Transfer to young person's psychiatric unit immediately
- 5- take no immediate action

Answer & Comments

Answer: 2- give N-Acetylcysteine intravenously

This patient has taken a huge paracetamol overdose only three hours previously so the paracetamol level would be pointless until after 4hrs. Also we know that she has taken a huge dose and that she needs urgent treatment. As absorption of paracetamol can be prevented by activated charcoal if given within 2 hours of ingestion it may be too late to use in this case. But generally algorithms suggest using NAC as early as possible. However, you would usually give activated charcoal as well particularly if taken with alcohol which may delay absorption.



[Q: 430] OnExamination -
Emergency medicine

A 38-year-old man experiences sudden deterioration after being admitted to the Intensive Care Unit because of severe pneumococcal pneumonia and septic shock. Arterial blood gas analysis reveals pH of 7.2, pO_2 of 90mmHg, pCO_2 of 35mmHg and HCO_3^- of 16mEq/L.

Which one of the following changes will be found in this patient?

- 1- Hyperventilation leading to the increase in CO₂ concentration
- 2- Increase production of HCO₃⁻
- 3- Increased renal excretion of HCO₃⁻
- 4- Raised hydrogen ions level in the blood
- 5- Respiratory acidosis

Answer & Comments

Answer: 4- Raised hydrogen ions level in the blood

This patient has metabolic acidosis with low HCO₃⁻ level while PaCO₂ level is normal.

The answer to this question is so simple for the scenario that in a patient with low pH, increased hydrogen ion concentration will be found.



[Q: 431] OnExamination -
Emergency medicine

A 18-year-old female is brought to A+E unconscious after having taken an overdose. On examination she has a Glasgow coma score of 6, a respiratory rate of 8 breaths per minute, a heart rate of 52 beats per minute and her blood pressure was 84/62 mmHg. Her pupils are small but are reactive to light, muscle tone is reduced and plantar responses are flexor.

Which of the following is she most likely to have taken in overdose?

- 1- Diazepam
- 2- Dihydrocodeine
- 3- Diphenhydramine
- 4- Ecstasy (MDMA)
- 5- Methanol

Answer & Comments

Answer: 2- Dihydrocodeine

Dihydrocodeine is an opiate analgesic and when taken in overdose has a number of toxic effects. It acts as a respiratory depressant leading to reduced respiratory rate. It can cause bradycardia and hypotension in large doses, papillary constriction is a diagnostic feature in opiate overdose it is also a CNS depressant and therefore causes coma in overdose. Benzodiazepines and antihistamines tend not to have the same cardiorespiratory effects as opiates, MDMA is a stimulant and can cause delirium, convulsions and ventricular arrhythmias. Diazepam would be less likely here due to the bradycardia and the hypotension.



[Q: 432] OnExamination -
Emergency medicine

A 50-year-old male who is well known to the casualty department attends inebriated. He has an alcoholic encephalopathy with a Glasgow Coma Scale of 13. He is jaundiced, describes no symptoms, but is mildly short of breath.

You are presented with his blood results:

Haemoglobin 7.4 g/dl (12 - 16 g/dl)
 White cell count 10.1 x 10⁹/L (4 - 10 x 10⁹/L)
 Platelets 137 x 10⁹/L (140-400 x 10⁹/L)
 Sodium 133 mmol/l (133 - 144 mmol/L)
 Potassium 3.7 mmol/l (3.5 - 5 x 10⁹/L)
 Urea 12 mmol/l (3 - 8 x 10⁹/L)
 Creatinine 113 micromol/l (50–100 µmol/L)
 AST 124 (5 - 40)
 Alkaline Phosphatase 224 (50 - 110)
 Total Protein 54 g/l (60 - 80g/L)
 Bilirubin 63 micromol/l (3- 18 µmol/L)
 Cholesterol 15.3 mmol/l (<5.5 mmol/L)
 Triglycerides 7.2 mmol/l (<2.2mmol/L)
 Blood film Profound spherocytosis

Which of the following is the most appropriate treatment for this patient?

- 1- IV Steroids
- 2- Oesophago-gastro-duodenoscopy
- 3- MRI pancreas
- 4- Supportive therapy
- 5- Urgent laparotomy

Answer & Comments

Answer: 4- Supportive therapy

A combination of jaundice, alcoholic hepatitis, hyperlipidaemia, and haemolysis is known as Zieve's syndrome. There is no specific treatment for Zieve's syndrome, but supportive therapy is indicated- correction of clotting abnormalities, treatment of haemolysis, treating alcohol withdrawal, preventing further alcohol intake and adequate nutrition. The spherocytosis is the result of the haemolysis. Pancreatitis is a possible differential diagnosis here, but in the first instance one would request an amylase rather than an MRI of the pancreas.



[Q: 433] OnExamination -
Emergency medicine

A 62-year-old male attends A+E with a severe nose bleed. He is known to have alcoholic cirrhosis. His investigations reveal:

haemoglobin 10.9 g/dL (13.0-18.0)
white cell count $5 \times 10^9/L$ (4-11)
platelet count $60 \times 10^9/L$ (150-400)
prothrombin time 17.5s (11.5-15.5)
APPT 42s (30-40)
fibrinogen 0.7 g/L (1.8-5.4)

What is the most appropriate blood product for this patient?

- 1- Cryoprecipitate
- 2- Factor VIII
- 3- Platelets
- 4- Prothrombin complex concentrate
- 5- whole blood

Answer & Comments

Answer: 1- Cryoprecipitate

The most significant abnormality is the low Fibrinogen. Therefore the best product to correct the fibrinogen out of those given is cryoprecipitate.

To correct a coagulopathy you need to aim for Fibrinogen $> 1.0g/L$, Platelets $>50 \times 10^9/L$, PT and APTT < 1.5 upper range of normal- so from the results you can see the most significant abnormality is the low fibrinogen, the platelets are low and APTT/PT prolonged but not really sufficient to cause bleeding.



[Q: 434] OnExamination -
Emergency medicine

A 70-year-old female is admitted 12 hours after taking an overdose of aspirin.

Investigations revealed:

Serum sodium 138 mmol/L (137-144)
Serum potassium 5.9 mmol/L (3.5-4.9)
Serum bicarbonate 14 mmol/L (20-28)
Serum urea 18.1 mmol/L (2.5-7.5)
Serum creatinine 238 $\mu\text{mol/L}$ (60-110)
Serum salicylate 1120 mg/L (8 mmol/L)

What is the most appropriate treatment of this patient?

- 1- Haemodialysis
- 2- Haemofiltration
- 3- Intravenous sodium bicarbonate.
- 4- Peritoneal dialysis.
- 5- Urine alkalinization.

Answer & Comments

Answer: 1- Haemodialysis

This patient is at major risk of aspirin toxicity as reflected by the excessive aspirin concentration and appears to have developed acute renal failure ?s acidotic with an elevated

potassium. Bicarbonate is recommended as a supportive therapy but in this patient, Haemodialysis is the treatment of choice. The latter is advised when the plasma-salicylate concentration is greater than 700 mg/litre (5.1 mmol/litre) or in the presence of severe metabolic acidosis as recommended within the BNF poisons section.

There is nothing wrong with haemofiltration it just removes the toxin more slowly.



[Q: 435] OnExamination -
Emergency medicine

A precordial thump:

- 1- Can be given following an unwitnessed cardiac arrest
- 2- Should be administered after a warning has been given to the patient
- 3- Can be delivered up to twice during a cardiac arrest
- 4- Delivers approximately 10 Joules of energy
- 5- Should be aimed at the position of V4 on the anterior chest wall

Answer & Comments

Answer: 4- Delivers approximately 10 Joules of energy

The precise indication for performing a precordial thump is following a witnessed or monitored cardiac arrest. Warning a patient who has arrested will serve little purpose! Only one thump should be delivered (before the first 200J defibrillatory shock) over the lower third of the sternum. Approximately 7 to 10 Joules of energy is delivered with an appropriately weighted thump (potential energy to mechanical energy to electrical energy).



[Q: 436] OnExamination -
Emergency medicine

A 51-year-old lady presented to hospital with

a two-day history of malaise and headache. On the day of admission the headache had become more intense and was associated with pain in her neck. Her husband reported that she had also been febrile and confused at times. She had previously been well and had no significant past medical history.

On examination, she was febrile 38.1°C, looked unwell and was photophobic. Kernig's and Brudzinski's signs were positive. The fundi were normal with no evidence of papilloedema.

Following a normal CT scan a lumbar puncture was performed and CSF analysis showed:

White cells	200/mm ³
Red cells	2/mm ³
CSF protein	0.9 g/L
CSF glucose	1.6 mmol/L
Plasma glucose	5.3 mmol/L

What is the most likely causative organism?

- 1- Escherichia coli
- 2- Listeria monocytogenes
- 3- Mycobacterium tuberculosis
- 4- Streptococcus pneumoniae
- 5- Streptococcus pyogenes

Answer & Comments

Answer: 4- Streptococcus pneumoniae

The most common causes of bacterial meningitis in persons over 50 years of age are:

1. Streptococcus pneumoniae
2. Neisseria meningitidis
3. Listeria monocytogenes
4. "Gram-negative bacilli"

Although this question tries to establish whether candidates are aware of the most common cause of meningitis in this group, some questions in the exam give additional clues as to the cause of meningitis.

Physical examination may provide clues to the aetiology of meningitis in affected patients:

(i) Morbilliform rash with pharyngitis and lymphadenopathy may suggest a viral etiology (EBV, CMV, adenovirus, HIV).

(ii) Macules and petechiae that rapidly evolve into purpura suggest meningococemia (with or without meningitis).

(iii) Vesicular lesions in a dermatomal distribution suggest varicella zoster virus.

(iv) Genital vesicles suggest HSV-2 meningitis.

(v) Sinusitis or otitis suggests direct extension into the meninges, usually with *Streptococcus pneumoniae* and *Haemophilus influenzae*.

(vi) Rhinorrhea or otorrhea suggest a CSF leak from a basilar skull fracture, with meningitis most commonly caused by *Streptococcus pneumoniae*.

(vii) Hepatosplenomegaly and lymphadenopathy suggest a systemic disease, including viral (eg, mononucleosis-like syndrome in EBV, CMV, and HIV) and fungal (eg, disseminated histoplasmosis) disease.

(viii) The presence of a murmur suggests infective endocarditis with secondary bacterial seeding of the meninges.

(ix) Evidence of parotitis is observed in some cases of mumps meningitis.

Kernig's sign In a supine patient, flex the hip to 90° while the knee is flexed at 90°. An attempt to further extend the knee produces pain in the hamstrings and resistance to further extension.

Brudzinksi sign: Passively flex the neck while the patient is in a supine position with extremities extended. This maneuver produces flexion of the hips in patients with meningeal irritation.



[Q: 437] OnExamination -
Emergency medicine

A youth worker, aged 40, presents to Accident and Emergency with vomiting. On detailed questioning, he states that he has taken about 36 paracetamol tablets 2 hours previously. He is vomiting profusely with a BP of 90/60 mmHg.

Which of the following measures would be the most appropriate immediate step in the management of this patient?

- 1- Paracetamol levels
- 2- Oral methionine
- 3- IV N-acetyl cysteine
- 4- IV fluids
- 5- Coagulation screen

Answer & Comments

Answer: 4- IV fluids

The most pressing issue in this patient is resuscitation as he is vomiting and is hypotensive. It is too early to carry out paracetamol levels as these should be carried out at 4 hours. Although he states that he has taken 18g of paracetamol this may NOT be the case and he may not require NAC. You can wait. An elevated INR gives an indication of hepatocellular damage and again this will not be seen at presentation of paracetamol overdose.



[Q: 438] OnExamination -
Emergency medicine

A 16-year-old girl presents with bilateral cervical lymphadenopathy. Her lymph node biopsy reveals a nodular sclerosing Hodgkin's disease.

Which one of the following features indicates a poorer prognosis?

- 1- Fatigue
- 2- Mediastinal mass of 3cm

- 3- Night sweats
- 4- Pruritis
- 5- Recent Epstein-Barr virus infection

Answer & Comments

Answer: 3- Night sweats

Important prognostic features in HD are Stage

- B symptoms- Fever/ night sweats and weight loss

- Mass > 10 cm

Therefore although fatigue and pruritus common, have no prognostic significance.

EBV infection commonly associated with HD but has no prognostic significance.



[Q: 439] OnExamination -
Emergency medicine

A 16-year-old girl presented with fever, headache and photophobia. Investigations revealed:

Cerebrospinal fluid examination

Opening pressure 260 mm H₂O (50-180)

Total protein 0.8 g/L (0.15-0.45)

Glucose 4.2 mmol/L (3.3-4.4)

White cell count 60 per ml (<5)

Lymphocytes 90% (60-70)

" Plasma glucose 6.4 mmol/L (3.0-6.0)

What is the most likely diagnosis?

- 1- Bacterial meningitis
- 2- Cryptococcal meningitis
- 3- Tuberculosis meningitis
- 4- Viral encephalitis
- 5- Viral meningitis

Answer & Comments

Answer: 5- Viral meningitis

A normal Cerebrospinal fluid (CSF) glucose together with a CSF lymphocytosis, an increased opening pressure, and a raised CSF protein is typical of a viral meningitis, which would be high on the list of differentials in patients of this age group (together with bacterial meningitis).

A handy guide to CSF findings



[Q: 440] OnExamination -
Emergency medicine

A 70 year-old male is admitted with haematemesis. He is currently being treated with warfarin for atrial fibrillation and his INR returns as 10.

Which of the following is the most appropriate immediate treatment of his INR?

- 1- cryoprecipitate
- 2- fresh frozen plasma
- 3- intravenous vitamin K
- 4- oral vitamin K
- 5- recombinant Factor VIII concentrate

Answer & Comments

Answer: 2- fresh frozen plasma

This patient has had a bleed related to a grossly elevated INR. Consequently the INR needs correction as rapidly as is possible. Vitamin K will correct the INR over a few days whereas, fresh frozen plasma will correct the bleeding time rapidly.



[Q: 441] OnExamination -
Emergency medicine

An 81 year-old female is admitted following a seizure although her relatives state that prior to this she had been increasingly confused, unsteady and unable to look after herself over the last 2-3 weeks.

On examination she was drowsy and had a temperature of 37.5°, and a blood pressure of

192/108 mmHg. She had a mixed aphasia, with a mild right hemiparesis.

What is the most likely diagnosis?

- 1- Acute cerebral infarction
- 2- Acute intracerebral hemorrhage
- 3- Cerebral abscess
- 4- Chronic subdural haematoma
- 5- Glioblastoma

Answer & Comments

Answer: 4- Chronic subdural haematoma

The history of variable "confusion" and unsteadiness for some weeks followed by an acute exacerbation is a typical presentation of a subdural haematoma in the elderly population.

Cerebral abscess is unlikely due to the absence of significant fever. Acute infarction or acute intracerebral hemorrhage would not explain the two weeks history of confusion and unsteadiness. Astrocytoma usually causes symptoms over months to years.

Mixed aphasia (or transcortical mixed aphasia) is, simply, not a complete 'global aphasia'. In global aphasia there is receptive and expressive dysphasia. Further reading on dysphasias Patients can often repeat words but not understand commands, name objects or have intelligible spontaneous speech. 'Mixed aphasia' is not specific for stroke, although it can be caused by it. It may be caused by Alzheimer's disease, bilateral cerebral damage, tumours, thalamic lesions and so on. It is an excellent choice of language defect for a Best of Five question since it is a good distractor.



[Q: 442] OnExamination -
Emergency medicine

Which of the following is currently recommended as the drug of choice in treating refractory ventricular fibrillation or pulseless

ventricular tachycardia?

- 1- Adenosine
- 2- Amiodarone
- 3- Bretyllium
- 4- Lidocaine
- 5- Magnesium

Answer & Comments

Answer: 2- Amiodarone

300mg of amiodarone made up to 20ml with 5% dextrose given as an intravenous bolus is the drug of choice. 100mg of lidocaine may be given intravenously when amiodarone is unavailable. Historically 5mg / Kg of Bretyllium was given, but it is no longer recommended.



[Q: 443] OnExamination -
Emergency medicine

A 22-year-old female develops a wheeze and extensive rash whilst eating a Chinese take-away. On examination, she has extensive wheeze and stridor, with urticaria covering her upper and lower limbs and trunk. Her BP is 80/45 mmHg.

What is the likely diagnosis?

- 1- C1 Esterase Deficiency
- 2- Food poisoning
- 3- Idiopathic urticaria
- 4- Monosodium glutamate syndrome
- 5- Peanut allergy

Answer & Comments

Answer: 5- Peanut allergy

Chinese cooking uses cashew nuts in many dishes, and patients with peanut allergy may also experience an anaphylactic reaction with cashew nuts. Chinese chefs also use peanut oil in the stir fry, and this may also precipitate an allergic reaction. An acute hypersensitivity reaction to monosodium glutamate (MSG) a

preservative common in Chinese food, may give rise to the "MSG syndrome". This is characterized by a sudden onset of headache, heartburn, palpitations, sweating, swelling, and flushing of the face. Patients may report a sense of increased facial pressure or tingling in the face. Symptoms generally start within 2 hours of eating foods rich in MSG. This condition is generally self-limited and will resolve. Antihistamines can be helpful in some cases. It is extremely unlikely that this syndrome will cause shock- which is what this patient presents with given the hypotension.



[Q: 444] OnExamination -
Emergency medicine

A 65 year-old male presents with acute severe headache, ataxia and vomiting. Six hours later he became drowsy. On examination he had left horizontal nystagmus, a partial left sixth cranial nerve palsy and extensor plantar responses. His blood pressure was 188/110 mmHg.

What is the most likely cause for this deterioration?

- 1- brain stem herniation
- 2- cerebral oedema
- 3- dehydration
- 4- malignant hypertension
- 5- non-convulsive status epilepticus

Answer & Comments

Answer: 1- brain stem herniation

The most likely explanation of the sudden deterioration will be brain stem herniation. The acute onset of symptoms with headache and vomiting indicating an acute intracranial haemorrhage. Mass effect created the brain stem herniation. Intravenous mannitol, intubation/ventilation, urgent CT brain and neurosurgical referral are indicated.



[Q: 445] OnExamination -
Emergency medicine

A 60-year-old man presents with an episode of memory loss. Three days earlier he had become confused. His wife led him into the house - he apparently sat down at her request, and had a cup of tea. He then wandered around the house, confused, but remained conscious and able to have some conversation with his wife, though continuing to ask similar questions repeatedly. After three hours, he abruptly returned to normal and had no recollection of the events.

What is the most likely diagnosis?

- 1- alcohol related amnesia
- 2- chronic subdural haematoma
- 3- complex partial status epilepticus
- 4- hysterical fugue state
- 5- transient global amnesia

Answer & Comments

Answer: 5- transient global amnesia

This is the typical clinical description of transient global amnesia which represent a transient vascular insufficiency of both hippocampi.



[Q: 446] OnExamination -
Emergency medicine

A 60-year-old male is brought to casualty in the early hours of the morning after being found unconscious in the street. On examination, he was drowsy but localised to painful stimuli. There was no evidence of head injury or meningism. Investigations revealed:

sodium 134 mmol/L (137-144)
potassium 4.0 mmol/L (3.5-4.9)
urea 4.0 mmol/L (2.5-7.5)
creatinine 80 micromol/L (60-110)
glucose 4.5 mmol/L (3.0-6.0)
chloride 100 mmol/L (95 - 107)

bicarbonate 25 mmol/L (20 - 28)

plasma osmolality 385 mosmol/Kg (278 - 305)

What is the most likely explanation for his presentation?

- 1- diazepam poisoning
- 2- ethanol poisoning
- 3- methanol poisoning
- 4- phenobarbitone poisoning
- 5- Phenytoin poisoning

Answer & Comments

Answer: 2- ethanol poisoning

This gent is intoxicated. He has a normal acid base balance slight hyponatraemia reflecting dilution and very high osmolality reflecting the presence of ethanol. Methanol would produce an acidosis. Diazepam is not an osmolyte nor would the other agents produce this picture.



[Q: 447] OnExamination -
Emergency medicine

A 40-year-old farmer presented to Casualty with a 24-hour history of fever and increasing confusion. On examination he was febrile 39.5°. A generalized erythematous rash, covering most of his body, was observed. He also had a paronychia infection of his right index finger, with lymphangitis extending caudally and with axillary lymphadenopathy. His heart rate was measured at 120 beats per minute with a blood pressure of 80/60 mmHg.

What is the most likely diagnosis?

- 1- Hantavirus infection
- 2- Leptospirosis
- 3- Orf
- 4- Staphylococcal toxic shock syndrome
- 5- Stevens-Johnson syndrome

Answer & Comments

Answer: 4- Staphylococcal toxic shock syndrome

The history is typical of staphylococcal toxic shock syndrome (TSS) ?shock, fever, confusion and rash. The primary source of infection in this case is the paronychia of his right index finger. Hantavirus infections (viral zoonoses transmitted via rodents) typically have two distinct presentations: either as a haemorrhagic fever with renal failure or as an acute pulmonary syndrome. The former manifestation is commonest in the far east and eastern Europe, while the latter is the predominant form in the southwestern United States and South America. Leptospirosis does not typically cause a rash and is often associated with jaundice; leptospirosis would not explain the lesion on his finger. Orf, a zoonotic infection caused by a pox virus, presents with painless ulcerated lesions on the hands of farmers, but does not fully explain this clinical picture. Stevens-Johnson syndrome typically starts with an erythema multiforme-type rash that spreads widely and involves the buccal mucosa and conjunctivae; often caused by antibiotic therapy, but does not fit the clinical picture presented here.



[Q: 448] OnExamination -
Emergency medicine

A 35-year-old lady presented with left sided weakness. She has a young family with a 5-year-old son and a 2-year-old daughter. Previously she had two spontaneous abortions. After the birth of her last child she developed a Deep Vein Thrombosis and received three months of anticoagulation with warfarin.

On examination she has left sided weakness with pyramidal signs. A CT head scan showed a right middle cerebral artery territory infarct.

Which of the following is the most likely diagnosis?

- 1- Hypertension
- 2- Kawasaki syndrome
- 3- Patent foramen ovale
- 4- Systemic lupus erythematosus
- 5- Thrombotic thrombocytopenic purpura

Answer & Comments

Answer: 4- Systemic lupus erythematosus

This patient has a prothrombotic tendency suggestive of the lupus anticoagulant with recurrent abortions, previous DVT and now she has developed a left hemiparesis.



[Q: 449] OnExamination -
Emergency medicine

A 16-year-old man is brought to the Accident and Emergency department with a GCS (Glasgow Coma Scale) rating of 3/15. Within 10 minutes he regained consciousness with a GCS of 15/15, is sitting up and talking.

What is he likely to have taken?

- 1- Inhaled solvent glue
- 2- Smoked heroine
- 3- Smoked marijuana
- 4- Snorted cocaine
- 5- Taken ecstasy

Answer & Comments

Answer: 1- Inhaled solvent glue

This patient was markedly comatose on arrival but quickly regains consciousness. This suggests a short acting (probably) inhaled anaesthetic like agent ?Glue. Marijuana would not be expected to produce this level of coma and the effects of cocaine would last much longer. The inhaled solvents, due to their lipophilicity, are rapidly absorbed through the lungs and then quickly distributed to the brain and other organs. The effects therefore appear within minutes of inhalation. Typical

substances that are inhaled include 'Toluene aromatic hydrocarbons' and Butane.



[Q: 450] OnExamination -
Emergency medicine

A 26-year-old woman presented in acute shock at 35 weeks of pregnancy with profuse vaginal bleeding. She had suffered two previous miscarriages. She had a pulse of 110 beats per minute, blood pressure of 110/84 mmHg and no foetal heart sounds were audible.

Investigations revealed:

Haemoglobin 9.5 g/dL

Platelets $66 \times 10^9/L$

Prothrombin time 21 sec (Control 11.5 - 15.5)

APTT 52 sec (Control 30 - 40)

Fibrinogen 0.5 g/L (NR 2 - 4)

What is the most appropriate next step in management?

- 1- antithrombin III infusion
- 2- fibrinogen replacement infusion (cryoprecipitate)
- 3- intravenous heparin
- 4- platelet transfusion
- 5- transfusion of two units group O Rhesus D negative blood

Answer & Comments

Answer: 2- fibrinogen replacement infusion (cryoprecipitate)

The clinical picture is disseminated intravascular coagulation. When bleeding is the major problem, the aim is to maintain the prothrombin and activated thromboplastin time at a ratio of 1.5 times of the control and the fibrinogen level above 1g/L. Platelet transfusion is recommended if the count is less than $50 \times 10^9 /L$. Anaemia is not very severe so in this case fibrinogen replacement

would be the appropriate choice. (Ref: Oxford textbook of Medicine)



[Q: 451] OnExamination -
Emergency medicine

A 70-year-old man was admitted with pallor, light-headedness and loss of energy. On the day prior to admission he had reported loose dark stools. Examination revealed a pulse of 110 per minute and a blood pressure of 106/70 mmHg.

Investigations revealed:

Haemoglobin 7.2 g/dL (14-18)

MCV 72 fL (78-96)

White cell count $11.3 \times 10^9/L$ (4-11)

Platelet count $480 \times 10^9/L$ (150-400)

What is the most appropriate next step in his management?

- 1- Barium meal
- 2- Blood transfusion
- 3- Endoscopy
- 4- Parenteral iron infusion
- 5- Proton pump inhibitor therapy

Answer & Comments

Answer: 2- Blood transfusion

There is only one answer here and that is blood transfusion. He has clearly had a major GI bleed since he presents with symptoms of shock with a high resting heart rate and lowish blood pressure the day after what sounds like melaena. What is more he has a significant microcytic anaemia. He should be resuscitated with blood transfusion and then send for upper GI endoscopy. A barium meal will not help a bleeding vessel. Parenteral iron is for chronic anaemia not acute bleeds and proton pump inhibitors, although widely used, have no supportive evidence and are nowhere near as important as giving blood to this man.



[Q: 452] OnExamination -
Emergency medicine

A 70-year-old man underwent emergency surgery for an acute abdomen. Following surgery he was noted to have become oliguric. Investigations revealed the following:

sodium 121 mmol/L (137-144)

potassium 6.6 mmol/L (3.5-4.9)

chloride 92 mmol/L (95-107)

Urea 17.2 mmol/l (3-8)

Creatinine 250 micromol/L (60-110)

Arterial blood gas pH 7.16

Standard Bicarbonate 15.6 (21-27)

What is the calculated anion gap for this patient?

- 1- 5 mmol/L
- 2- 10 mmol/L
- 3- 15 mmol/L
- 4- 20 mmol/L
- 5- 25 mmol/L

Answer & Comments

Answer: 4- 20 mmol/L

Anion gap is calculated as $(Na+K) - (Cl+HCO_3)$. Therefore in this patient, the calculated value is 20 mmol/l. The normal anion gap is between 8-16 mmol/l, the excessive value reflecting the presence of other acidic anions and in this case with the metabolic acidosis the constituents may be lactate etc.



[Q: 453] OnExamination -
Emergency medicine

These are the blood gas results obtained in a 20-year-old female admitted to hospital.

hydrogen ion concentration 35 nmol/L (35-45)

pH 7.45 (7.35-7.45)

pCO₂ 6.8 kPa (4.6-5.9)

bicarbonate 32 mmol/L (22 - 26)

Which one of the following is a recognised cause of this acid-base disorder?

- 1- Amitriptyline overdose
- 2- Cushing's syndrome
- 3- hepatic failure
- 4- pregnancy
- 5- salicylate poisoning

Answer & Comments

Answer: 4- pregnancy

This patient has a mild metabolic alkalosis with what appears to be respiratory compensation as reflected by the elevated pCO₂. Amitriptyline overdose is associated with acidosis as is salicylate poisoning. Hepatic failure usually presents with acidosis. This type of picture is associated with prolonged vomiting (as in pregnancy), diarrhoea, diuretic therapy and in Cushing's syndrome or in those receiving high dose corticosteroids. With no other information provided for this case, common things being common, one should select pregnancy as the best answer for a 20-year-old female.



[Q: 454] OnExamination -
Emergency medicine

A 32-year-old female smoker presents with acute severe asthma. The SaO₂ are 80% on 15L of Oxygen and the pO₂ is 8.2kPa (10.5-13). There is widespread expiratory wheeze throughout the chest. She is given IV Hydrocortisone, 100% oxygen and 5mg of nebulised salbutamol.

What is the next best option?

- 1- Oral prednisolone
- 2- IV Augmentin
- 3- IV Magnesium
- 4- IV Potassium
- 5- IV Theophylline

Answer & Comments

Answer: 3- IV Magnesium

This question focuses on acute treatment of asthma. Your initial approach should be SOS salbutamol, oxygen and steroids (IV). In the meantime a CXR should be organised to rule out pneumothorax. You should then consider further efforts to treat bronchoconstriction- a silent chest, or a tiring patient should suggest ITU review

The recommended dose of Magnesium is 2g over 30 minutes. The mechanism by which it has its effect is not fully understood, but it is thought that low Magnesium levels in bronchial smooth muscle favour bronchoconstriction. IV theophylline may be considered, but Magnesium would be higher on the list. IV antibiotic may be indicated, but your initial focus should be promoting bronchodilation. IV Potassium may be required as the beta agonists push down the potassium. Oral Prednisolone can wait, as you have already given IV hydrocortisone as part of your SOS approach.



[Q: 455] OnExamination -
Emergency medicine

An anxious 22-year-old female with a high respiration rate has the following arterial blood gas results:

pH	7.27 (7.35-7.45)
pCO ₂	2.6 KPa (3.5-5.5)
Base excess	-12 mmol/l

What is the interpretation of the acid-base status?

- 1- Combined metabolic and respiratory acidosis
- 2- Combined metabolic and respiratory alkalosis
- 3- Metabolic acidosis with some compensatory respiratory alkalosis

- 4- Respiratory acidosis with some compensatory metabolic alkalosis
- 5- Respiratory alkalosis with some compensatory metabolic acidosis

Answer & Comments

Answer: 3- Metabolic acidosis with some compensatory respiratory alkalosis

This patient has a metabolic acidosis as evidence by a pH of 7.27 and a negative base excess, which is a marker of the extent of acidosis. The low CO₂ is a reflection of the physiological respiratory compensation which is attempting to normalize pH by clearing the acidic gas CO₂.



[Q: 456] OnExamination -
Emergency medicine

A 20-year-old man presented after ingesting a drug at a party. Investigations revealed:

serum creatine kinase 10,000 IU/L (24-195)

Which one of the following drugs is most likely to have been responsible?

- 1- "Ecstasy" (MDMA)
- 2- Cannabis
- 3- Diazepam
- 4- Gamma hydroxybutyrate (GHB)
- 5- Ketamine

Answer & Comments

Answer: 1- "Ecstasy" (MDMA)

Symptoms of an acute MDMA toxic reaction include agitation, tachycardia, hypertension, dilated pupils, trismus, and sweating, whereas the more severe cases may be characterized by hyperthermia, disseminated intravascular coagulation (DIC), rhabdomyolysis, and acute renal failure. In more severe cases, elevated creatine kinase levels are often present, with levels as high as 555,000 IU/L being reported. Neither GHB nor Ketamine are associated with

elevated CK levels. PCP (Phencyclidine) is another drug which may cause an elevated CK in overdose.



[Q: 457] OnExamination -
Emergency medicine

A 17-year-old girl underwent emergency splenectomy after a domestic accident.

Which one of the following organisms is most likely to cause life-threatening infection in the future?

- 1- Actinomyces
- 2- Haemophilus influenzae
- 3- Pseudomonas aeruginosa
- 4- Staphylococcus aureus
- 5- Streptococcus pneumoniae

Answer & Comments

Answer: 5- Streptococcus pneumoniae

Following splenectomy a person is at risk of Streptococcus pneumoniae, Haemophilus influenzae, Neisseria meningitidis, Escherichia coli and Pseudomonas aeruginosa.

By far the most common is Streptococcus pneumoniae- which can cause life threatening infection.



[Q: 458] OnExamination -
Emergency medicine

A 44-year-old male with Child's grade C cirrhosis presented with haematemesis.

Which one of the following drugs, administered intravenously, would be the most appropriate, immediate, treatment?

- 1- Isosorbide dinitrate.
- 2- Omeprazole.
- 3- Propranolol
- 4- Somatostatin
- 5- Tranexamic acid.

Answer & Comments

Answer: 4- Somatostatin

The suggestion is that this patient is at particularly high risk of oesophageal varices. Child's classification of cirrhosis is a points scale based upon ascites/bilirubin etc reflecting prognosis. Graded depending upon the points scored from A-C with C reflecting greatest risk. Somatostatin acts to reduce portal pressures and has been demonstrated to be as effective as endoscopy at controlling variceal bleeding in the acute setting. B-blockers can be used as oral prophylaxis for oesophageal varices. IV Omeprazole has also been shown to be effective in reducing mortality in GI haemorrhage of any cause (NEJM 2002) but somatostatin may be expected to be superior for the above patient.



[Q: 459] OnExamination -
Emergency medicine

Which of the following would be expected features of a LEFT Posterior cerebral artery occlusion :

- 1- a right homonymous hemianopia
- 2- internuclear ophthalmoplegia
- 3- Wernicke's aphasia
- 4- pure aphasia (i.e. without alexia)
- 5- decerebrate state

Answer & Comments

Answer: 1- a right homonymous hemianopia

b- typical of multiple sclerosis. c+d-Middle cerebral artery. e-False? Pontine lesion. Other possible findings in posterior left cerebral artery occlusion: cortical blindness, visual hallucinations, thalamic syndrome, Claude's and Weber's syndromes.



[Q: 460] OnExamination -
Emergency medicine

A 19-year old girl has been brought to A & E

by her friends following a night out at a party. Her friends comment that she has been talking by herself about 'irrelevant things'. She seems agitated and restless. On examination, her reflexes are increased and an ECG demonstrates ventricular ectopics.

What kind of substance abuse do you suspect at this point?

- 1- Alcohol
- 2- Barbituate
- 3- Cannabis
- 4- Ecstasy
- 5- Glue sniffing

Answer & Comments

Answer: 4- Ecstasy

This is a case of Ecstasy overdose. Ecstasy (3,4-methylenedioxymethamphetamine, MDMA) stimulate the central nervous system. It causes increased alertness and self-confidence, euphoria, extrovert behaviour, increased talkativeness with rapid speech, lack of desire to eat or sleep, tremor, dilated pupils, tachycardia, and hypertension. More severe intoxication is associated with excitability, agitation, paranoid delusions, hallucinations with violent behaviour, hypertonia, and hyperreflexia. Convulsions, rhabdomyolysis, hyperthermia, and cardiac arrhythmias may also develop. In severe cases of MDMA poisoning, hyperthermia, disseminated intravascular coagulation, rhabdomyolysis, acute renal failure, and hyponatraemia are observed. Hepatic damage has also been reported. Rarely, poisoning due to amphetamines may result in intracerebral and subarachnoid haemorrhage and acute cardiomyopathy; these complications may be fatal. Hyperthyroxinaemia may be found in chronic amphetamine users.



[Q: 461] OnExamination -
Emergency medicine

A 35-year-old woman with a five year history of treated hypothyroidism, presented following an episode of vomiting and collapse. There was a short history of weight loss. On examination she had a temperature of 37.7C, a blood pressure of 80/40 mmHg and vitiligo.

Which one of the following, given intravenously, would be the most appropriate initial management?

- 1- 10% dextrose infusion
- 2- Cefotaxime
- 3- Fludrocortisone
- 4- Hydrocortisone
- 5- tri-iodothyronine

Answer & Comments

Answer: 4- Hydrocortisone

This patient is likely to have Addison's disease based upon her history, autoimmune disease, and presentation. She requires treatment with IV hydrocortisone which can be a life saving manoeuvre in acute hypoadrenalism.



[Q: 462] OnExamination -
Emergency medicine

A 22-year-old man suffers a deep laceration to the forearm resulting in transection of the median nerve.

Following this injury, the nerve will undergo which of the following pathological processes?

- 1- Chronic inflammation
- 2- Coagulative necrosis
- 3- Fibrinoid necrosis
- 4- Segmental demyelination
- 5- Wallerian degeneration

Answer & Comments

Answer: 5- Wallerian degeneration

Degeneration of the portion of the nerve distal to the injury. Segmental demyelination is a feature seen in axons in the central nervous system with multiple sclerosis.



[Q: 463] OnExamination -
Emergency medicine

A 51-year-old policewoman presents with a long history of watering of her left eye. Over the preceding 3 days she had developed facial pain and swelling. On examination she is well, afebrile, has a watering left eye, and a red, tense, tender swelling between the side of the nose and just below the left inner canthus.

What is the diagnosis?

- 1- Acute dacrocystitis
- 2- Orbital cellulitis
- 3- Sinusitis
- 4- Erysipelas
- 5- Epiphora

Answer & Comments

Answer: 1- Acute dacrocystitis

The long history of eye watering suggests long-standing obstruction of the nasolacrimal duct. This predisposes to acute infection of the lacrimal sac (acute dacrocystitis) which has the clinical features described above. Epiphora is another name for eye watering. The causes of eye watering are: Iritis, Corneal foreign body, Acute glaucoma, Obstruction to the lacrimal passageways (including VIIth nerve palsy) and Chronic eye inflammation.



[Q: 464] OnExamination -
Emergency medicine

A 19-year-old girl presents with an overdose of Paracetamol.

Which of the following statements is correct?

- 1- Acetylcystine should routinely be given if the presentation is within the first 12 hours of overdose.

- 2- Because she is over the age of 6, she is unlikely to develop significant toxicity.
- 3- Liver function tests should be monitored.
- 4- The mortality in those with an AST of >350 IU/L is 4%.
- 5- Hospitalisation will be needed for at least 5 days.

Answer & Comments

Answer: 3- Liver function tests should be monitored.

Treatment with N-acetyl cysteine (NAC) is given according to a standard nomogram. NAC may be useful up to 36 hours following ingestion. Children under the age of 6 are unlikely to develop significant toxicity, but adolescents have a higher incidence of toxic plasma levels following ingestion, and a higher incidence of abnormal AST >1000/U/L. Even after serious hepatotoxicity, the mortality rate is under 0.5%. The occasional patient may require liver transplantation.



[Q: 465] OnExamination -
Emergency medicine

A 21-year-old man, who has a past history of IV drug abuse, presents 12 hours after taking an overdose of 480 mg of codeine and 30 g of paracetamol. His blood pressure is 100/60 mmHg and he has pin-point pupils.

What is the most appropriate management for this patient?

- 1- 500ml 10% glucose IV over 4 hours
- 2- 1 litre normal saline IV over 6 hours
- 3- IV naloxone
- 4- IV flumazenil
- 5- start N-acetylcysteine

Answer & Comments

Answer: 5- start N-acetylcysteine

This patient presents 12 hours after taking a potentially fatally toxic dose of paracetamol. Under the circumstances provided in this question where there is an absence of data relating to pulse rate (as he is probably not in shock), respiratory rate (reflecting respiratory depression) or blood glucose, the most appropriate intervention at this 12 hour time point would be N-acetylcysteine.

The urgency of treatment is underlined by the fact that the incidence of hepatotoxicity is worse if treatment is delayed. Trials of N-acetylcysteine suggest that the incidence of hepatotoxicity is 1% in those treated within 8 hours v 46% in those treated after 16 hours.



[Q: 466] OnExamination -
Emergency medicine

A 42-year-old female is admitted following an overdose of Diazepam and alcohol. On examination she was unconscious with a core temperature of 34.5°C and a blood pressure of 110/80 mmHg.

Investigations reveal:

Creatinine 242 micromol/L (60-100)

AST 500 U/L (0-40)

Gamma GT 35 U/L (<50)

" urine microscopy no cells or organisms

" urine dipstick analysis blood+++

" Ultrasound abdomen normal

Which one of the following is the most likely cause of these findings?

- 1- Associated Paracetamol poisoning
- 2- Chronic renal failure
- 3- Dehydration
- 4- Hypothermia
- 5- Rhabdomyolysis

Answer & Comments

Answer: 5- Rhabdomyolysis

This patient has taken an overdose of diazepam and has collapsed for an indeterminate period. She is now seen with renal impairment. The features together with the elevated AST (from muscle) suggest a diagnosis of rhabdomyolysis.



[Q: 467] OnExamination -
Emergency medicine

A 55-year-old male presented six hours after taking an overdose of Lithium tablets which had been prescribed for a bipolar affective disorder.

On examination he was tremulous, had suffered a convulsion and had a Glasgow coma scale of 12/15. His serum lithium concentration was 5.0 mmol/L (0.5 - 1.0)

What is the most appropriate management of this patient?

- 1- Activated charcoal
- 2- Forced alkaline diuresis
- 3- Furosemide 100 mg intravenously twice daily
- 4- Haemodialysis
- 5- Measure lithium concentration in 2 hours

Answer & Comments

Answer: 4- Haemodialysis

The patient has a severe lithium overdose as reflected by markedly elevated Lithium concentrations and features of impaired consciousness, tremor and seizures. This needs urgent management. Activated charcoal does not bind Lithium effectively and is therefore ineffective except where co-ingestion of other poisons is suspected. Haemodialysis is the mainstay of treatment for acute Lithium toxicity.



[Q: 468] OnExamination -
Emergency medicine

A 24-year-old man presented twelve hours

after an overdose of dihydrocodeine 1.2 g and paracetamol 30 g. He had pinpoint pupils, a Glasgow Coma Scale score of 14 and a blood pressure of 100/60 mmHg.

Which one of the following is the most appropriate management?

- 1- 500ml of 10% glucose intravenously over four hours.
- 2- Intravenous Flumazenil.
- 3- Intravenous Naloxone.
- 4- Intravenous N-acetylcysteine.
- 5- Oral activated charcoal.

Answer & Comments

Answer: 4- Intravenous N-acetylcysteine.

This patient's GCS is reasonable and the opiate-like effects seem minimal (no evidence of respiratory depression). However, this patient has received a hefty dose of paracetamol conferring a high risk of hepatic toxicity. The 12 hour delay makes the absorptive effects of charcoal limited and although it would be useful as gastric emptying may be delayed it is not as important in this patient as the paracetamol antidote. Even though the paracetamol level is not provided, he should be treated with N-acetylcysteine without delay.



[Q: 469] OnExamination -
Emergency medicine

A 35-year-old male with a long history of ulcerative colitis is treated for an acute exacerbation which settles following an alteration of his medication. 6 weeks after discharge he is re-admitted with sepsis and his results show:

haemoglobin 10.5 g/dL (11-16)

white cell count $2.0 \times 10^9/L$ (4-11)

platelets $90 \times 10^9/L$ (150-400)

Which one of the following drugs is most likely to be the cause of his pancytopenia?

- 1- Azathioprine
- 2- Mesalazine
- 3- Metronidazole
- 4- Pamidronate
- 5- Prednisolone

Answer & Comments

Answer: 1- Azathioprine

The answer could be either A or B as both cause a pancytopenia although azathioprine is the more common cause. Hence it is a toss up but one would have to go for A.



[Q: 470] OnExamination -
Emergency medicine

A 55-year-old nurse developed bronchospasm and urticaria twenty minutes into surgery under general anaesthesia. The mast cell tryptase concentration confirmed an acute allergic reaction. Later, it transpired that she had developed allergic reactions at her dentist and had developed frequent episodes of wheezing when assisting at sterile procedures.

What is the most likely diagnosis?

- 1- allergy to anaesthetic induction agents
- 2- allergy to local anaesthetic agents
- 3- Latex allergy
- 4- pressure urticaria
- 5- systemic mastocytosis

Answer & Comments

Answer: 3- Latex allergy

This patient developed anaphylaxis during a surgical procedure and it appears that she had problems with allergies during dental treatment and whilst assisting during sterile procedures. This would suggest that she is allergic to latex rather than induction agents or local anaesthesia as latex would be present in all three of the above procedures. Systemic

mastocytosis is a disease which usually affects the elderly and is associated with urticaria pigmentosa, diarrhoea, hypotension, sclerotic bone changes and mast cell infiltration of organs such as spleen, liver kidneys.



[Q: 471] OnExamination -
Emergency medicine

Seventeen of twenty-four passengers on a Nile cruise develop bloody diarrhoea on the third day.

Which of the following organisms is the likely cause?

- 1- Giardia lamblia
- 2- Vibrio cholerae
- 3- Shigella dysenteriae
- 4- Schistosoma mansoni
- 5- Entamoeba histolytica

Answer & Comments

Answer: 3- Shigella dysenteriae

Dysentery is characterised by the passing of frequent (sometimes very frequent) stools, that may contain blood, mucus or pus. Shigella dysenteriae is responsible for bacillary dysentery, a disease most often associated with crowded, unsanitary conditions. Other species of Shigella may produce milder forms of diarrhoeal disease. Dysentery is an oral infection transmitted via faecal contamination of water or food. During the 1-4 day incubation period, penetration of bacteria into the mucosal epithelial cells of the intestine causes an intense irritation of the intestinal wall, producing cramps and a watery, bloody diarrhoea.



[Q: 472] OnExamination -
Emergency medicine

A 40-year-old man presents with acute weakness and palpitations. Investigations reveal:

Sodium	143 mmol/L (137 - 144)
Potassium	8.0 mmol/L (3.5-4.9)
Urea	35 mmol/L (2.5 - 7.5)
Creatinine	450 umol/L (60 - 110)
Bicarbonate	5 mmol/L (20 - 28)

What is the best immediate therapy?

- 1- intravenous calcium gluconate
- 2- intravenous dextrose and insulin
- 3- intravenous sodium bicarbonate
- 4- nebulised salbutamol
- 5- rectal calcium resonium

Answer & Comments

Answer: 1- intravenous calcium gluconate

This patient appears to have acute renal failure with severe acidosis, hyperkalaemia and has palpitations. The patient should be rehydrated, treated with insulin and given bicarbonate, but the immediate treatment particularly in the context of a life threatening arrhythmia would be Calcium gluconate.



[Q: 473] OnExamination -
Emergency medicine

A 24-year-old law student attends with visual loss affecting the right eye. She reports a constant headache for the last 3 months, and absence of menses for 6 months.

On examination her visual acuity in the right eye is 6/24, with slight constriction of the temporal field in that eye but she has no other neurological deficit. She is afebrile and haemodynamically stable.

What is the diagnosis?

- 1- Glaucoma
- 2- Migraine
- 3- Multiple sclerosis
- 4- Pituitary tumour
- 5- Pregnancy

Answer & Comments

Answer: 4- Pituitary tumour

This patient has a pituitary lesion; the history of headache and amenorrhoea suggests a prolactinoma or non functioning tumour. This has been complicated by involvement of the visual pathway, which has precipitated her visual loss. She needs urgent assessment of her pituitary function, imaging of the pituitary gland by MRI scanning. One of the most important investigations to perform would be a serum prolactin. The amenorrhoea would argue against this being retrobulbar neuritis associated with MS and similarly the peripheral visual field constriction would be unusual as a central scotoma and fluctuating visual loss would be more typical.



[Q: 474] OnExamination -
Emergency medicine

An 18 year-old woman presents with an acute pulmonary embolism in the ninth week of pregnancy.

What is the most appropriate treatment for this patient throughout her pregnancy?

- 1- Aspirin
- 2- Intravenous unfractionated heparin
- 3- Subcutaneous low molecular weight heparin
- 4- Subcutaneous unfractionated heparin
- 5- Warfarin

Answer & Comments

Answer: 3- Subcutaneous low molecular weight heparin

Anticoagulation with subcutaneous heparin is recommended in most guidelines with LMWH being a suitable alternative. The latter has the advantage of requiring no monitoring but is a less well established therapy in pregnancy.

She cannot be treated with IV heparin throughout her pregnancy and Warfarin is also contra-indicated due to teratogenicity. Aspirin provides no demonstrable prophylactic value for venous thromboembolism.



[Q: 475] OnExamination -
Emergency medicine

A 40-year-old male presents with a 6 hour history of profuse vomiting and over the last two hours had developed left sided chest pain and dyspnoea. On examination he had a pulse of 110 beats per minute regular and a blood pressure of 168/90 mmHg. On palpation, he had crepitus over the left supraclavicular region and neck, reduced heart sounds and left basal sided crackles plus some dullness to percussion over the right base of the chest.

What is the most likely diagnosis?

- 1- Aortic dissection
- 2- Aspiration pneumonia
- 3- Oesophageal rupture
- 4- Perforated peptic ulcer
- 5- Pneumothorax

Answer & Comments

Answer: 3- Oesophageal rupture

This man has a history of vomiting which had then progressed to chest pain. The most relevant finding on examination is the crepitus over the chest indicating surgical emphysema. The most probable cause is therefore spontaneous rupture of the oesophagus. Mackler's triad (vomiting, chest pain and cervical emphysema) is almost pathognomonic but absent in almost half the cases. The CXR may reveal the surgical emphysema and a gastrografin swallow is diagnostic.



[Q: 476] OnExamination -
Emergency medicine

Which of the following forms of pulmonary embolism is the commonest cause of secondary pulmonary hypertension?

- 1- Air embolism (Caisson's disease)
- 2- Fat embolism
- 3- Massive pulmonary embolism (e.g., saddle embolism)
- 4- Multiple small recurrent pulmonary embolism
- 5- Paradoxical embolism

Answer & Comments

Answer: 4- Multiple small recurrent pulmonary embolism



[Q: 477] OnExamination -
Emergency medicine

A 75-year-old man was admitted after been found collapsed in a garden shed surrounded by a number of empty containers. On clinical examination the patient had small pupils, a heart rate of 50 beats per minute, and was frothing at the mouth.

What is the most likely diagnosis?

- 1- Creosote poisoning.
- 2- Glyphosate poisoning.
- 3- Organophosphorus poisoning.
- 4- Paraquat poisoning.
- 5- Pyrethroid poisoning.

Answer & Comments

Answer: 3- Organophosphorus poisoning.

The patient has cholinergic features with a relative bradycardia, small pupils and increased salivation. This is highly suggestive of organophosphorus poisoning which as an anticholinesterase inhibitor, thus prolonging the effects of acetylcholine. Paraquat is

associated with nausea vomiting and diarrhoea with ulceration. Creosote is a petroleum based substance and would not have such an effect. Glyphosate herbicides produces nausea, vomiting and diarrhoea with a caustic effect in the mouth. Pyrethroid is an insecticide and poisoning is rare but associated with coma, convulsions and pulmonary oedema.



[Q: 478] OnExamination -
Emergency medicine

An 18-year-old woman is admitted after taking drugs at a night-club.

Which of the following features suggest she had taken Ecstasy (MDMA)?

- 1- A pyrexia of 40°C
- 2- hypernatraemia
- 3- hypokalaemia
- 4- metabolic acidosis
- 5- respiratory depression

Answer & Comments

Answer: 1- A pyrexia of 40°C

Hyponatraemia, tachycardia, hyperventilation and hyperthermia are features of the amphetamine MDMA abuse.



[Q: 479] OnExamination -
Emergency medicine

A 27-year-old female presents to the surgical intake with abdominal pain and 5 day history of vomiting. Over the last 3 months she has also been aware of a 6kg weight loss. On examination, she is pale, has a temperature of 38.5 C, blood pressure of 90/60 mmHg and pulse rate of 130 in sinus rhythm. The chest is clear on auscultation but she has a diffusely tender abdomen with no guarding.

Her BM reading is 2.5.

Initial biochemistry is as follows:

Sodium	124 mmol/l	(134 - 144 mmol/L)
Potassium	6.0 mmol/l	(3.5 - 5.5 mmol/L)
Urea	7.5 mmol/l	(3 - 8 mmol/L)
Creatinine	78 µmol/l	(50 - 100 µmol/L)
Glucose	2.0 mmol/l	(3.5 - 6 mmol/L)

What is the probable diagnosis?

- 1- Abdominal migraine
- 2- Acute appendicitis
- 3- Acute cholecystitis
- 4- Addison's disease
- 5- Insulinoma

Answer & Comments

Answer: 4- Addison's disease

This patient has clinical features of hypoadrenal crisis with abdominal pain and vomiting and shock with hypoglycaemia, hyponatremia and hyperkalaemia in keeping with hypoadrenalism. She needs emergency fluid resuscitation, steroid administration, (prior to this urgent cortisol measurement), and careful search for occult infection. One may expect to find features of addison's disease such as oral pigmentation or other autoimmune disease.



[Q: 480] OnExamination -
Emergency medicine

A 70-year-old female who has a history of chronic anxiety presents with a 3 day history of severe left temporal headache radiating from the eye to the scalp. She had also experienced discomfort during eating.

Which one of the following drugs should be given to this patient while awaiting the results of diagnostic tests?

- 1- Acyclovir
- 2- Carbamazepine
- 3- Diclofenac
- 4- Prednisolone

5- Sumatriptan

Answer & Comments

Answer: 4- Prednisolone

The history suggests temporal arteritis irrespective of the history of anxiety and in view of the sight threatening nature of the disease, the patient should be commenced on steroids. Although the differential diagnosis is also trigeminal neuralgia steroids should be used here whilst awaiting diagnostic investigations as temporal arteritis may be sight threatening if left untreated.



[Q: 481] OnExamination -
Emergency medicine

A 16 year-old girl is brought to A+E after having taking drugs at a rave.

Which of the following suggests that she has taking Ecstasy (MDMA)?

- 1- hypernatraemia
- 2- metabolic acidosis
- 3- Pin-point pupils
- 4- Pyrexia
- 5- respiratory depression

Answer & Comments

Answer: 4- Pyrexia

The features of ecstasy overdose include hyperthermia, hypertension, hyponatraemia due to polydipsia associated with SIADH and respiratory alkalosis. Pin-point pupils suggest opiates.



[Q: 482] OnExamination -
Emergency medicine

A 16-year-old girl presents with an acute exacerbation of asthma.

On examination her respiratory rate was 30 per minute, her heart rate was 120 beats per

minute and a peak expiratory flow rate (PEFR) was 30% of the predicted value.

Her blood gas analysis on air shows:

paO₂ 9 kPa (11.3-12.6)

paCO₂ 3.5 kPa (4.7-6.0)

After the administration of oxygen and corticosteroids what is the most appropriate next step in management?

- 1- Intravenous Aminophylline
- 2- Intravenous Salbutamol
- 3- Ipratropium Bromide via oxygen-driven nebuliser
- 4- Salbutamol via oxygen-driven nebuliser
- 5- Salmeterol via breath-actuated inhaler

Answer & Comments

Answer: 4- Salbutamol via oxygen-driven nebuliser

This patient has severe asthma as revealed by the low PEFR, low P02 and signs.

The next stage in the management is the administration of nebulised beta 2 agonists with supplementation of high flow oxygen (minimum of 6L/minute).

Beta 2 agonists can be administered in 15-30 minute intervals if required. Intravenous therapy with beta 2 agonists should only be used if inhaled therapies cannot be reliably administered.



[Q: 483] OnExamination -
Emergency medicine

In adult basic life support the correct ratio of chest compressions to ventilations is:

- 1- 5 to 1
- 2- 8 to 1
- 3- 10 to 1
- 4- 15 to 2
- 5- 30 to 2

Answer & Comments

Answer: 5- 30 to 2

15 compressions to 2 breaths was the recommended ratio regardless of the number of rescuers performing basic life support, but the recent guidelines now suggest 30:2.



[Q: 484] OnExamination -
Emergency medicine

A 45-year-old male is seen in the Emergency Department complaining of cough and dyspnoea. On examination he is disorientated and febrile at 38.5°C. He has a pulse of 100/min and his blood pressure is 85/55 mmHg. He has oxygen saturations of 89% on air and has a respiratory rate of 36/min. Chest x-ray shows left basal consolidation. Results show:

Sodium	140 mmol/l	(133-144)
Potassium	4.0 mmol/l	(3.5-5.5)
Urea	10.2 mmol/l	(3-8)
Creatinine	96 micromol/l	(50-100)

Which of the following is not part of the CURB score?

- 1- Blood urea concentration
- 2- Confusion
- 3- Consolidation on chest-x-ray
- 4- Hypotension
- 5- Tachypnoea

Answer & Comments

Answer: 3- Consolidation on chest-x-ray

The CURB score is calculated by assessment of Core Adverse Prognostic Features which are used in assessment of severity of pneumonia. Two from 4 features indicate a severe pneumonia and hospital admission is advised.

The CURB score is calculated using

1. Confusion abbreviated mental test score < 8

2. Urea > 7mmol/l

3. Respiratory rate > 30/min

4. Blood Pressure Systolic BP < 90 or diastolic BP < 60.



[Q: 485] OnExamination -
Emergency medicine

Which of the following would be expected to reduce maternal mortality when given in eclampsia?

- 1- Insulin and dextrose infusion
- 2- Low dose dopamine infusion
- 3- Magnesium infusion
- 4- Phenytoin infusion
- 5- Salbutamol infusion

Answer & Comments

Answer: 3- Magnesium infusion

Magnesium has been shown to significantly reduce maternal mortality in eclampsia and a favourable outcome may also be expected in pre-eclampsia. None of the other agents has been associated with a reduced mortality in eclampsia.



[Q: 486] OnExamination -
Emergency medicine

A 45-year-old man attends Emergency Department with symptoms suggestive of community acquired pneumonia. On examination he is pyrexial at 38.0°C and has a respiratory rate of 32/min, with a blood pressure of 85/55mmHg.

Which of the following combination of features are not necessarily an indication for urgent hospital admission?

- 1- BP of 85/55 mmHg and respiratory rate of 32/min
- 2- Confusion and BP of 85/55mmHg

- 3- Pyrexia of 38.0oC and serum urea of 7.5 mmol/l
- 4- Respiratory rate of 32 and blood urea of 7.5 mmol/l
- 5- BP of 85/55 mmHg and urea of 7.5 mmol/l

Answer & Comments

Answer: 3- Pyrexia of 38.0oC and serum urea of 7.5 mmol/l

This patient has community acquired pneumonia. The CURB score can be used in the assessment of severity using Core Adverse Prognostic Features which are 2 from 4 of:

- 1. Confusion abbreviated mental test score < 8
- 2. Urea > 7mmol/l
- 3. Respiratory rate > 30/min
- 4. Blood Pressure Systolic BP < 90 or diastolic BP < 60.

Clinical judgement must still however be used particularly if only one feature is present or if there is co-morbidity such as age >50 years, chronic cardiac, respiratory or renal disease.



[Q: 487] OnExamination - Emergency medicine

A known case of chronic obstructive pulmonary disease presents to A & E, distressed and cyanosed. Arterial blood gases reveal a pH 7.2, pO_2 55 mmHg and pCO_2 60 mmHg. He is given high concentration oxygen together with a salbutamol nebulizer. Intravenous hydrocortisone is also given. The patient becomes even worse with poorer breathing effort although pulse oximetry showed SaO_2 of 93%.

What is the cause of patient deterioration?

- 1- Constriction of bronchioles in response to salbutamol nebulizer
- 2- High concentration oxygen administration

- 3- Pulmonary artery relaxation causing mismatch between perfusion and ventilation
- 4- Pulmonary vein relaxation causing mismatch between perfusion and ventilation
- 5- Reaction to IV hydrocortisone

Answer & Comments

Answer: 2- High concentration oxygen administration

Obviously the patient was suffering from hypoxia and hypercapnia as a result of acute exacerbation of COPD. His respiratory centre was solely stimulated by hypoxia. That is why his respiratory effort became less and the condition worsened when he was given high concentration oxygen, depriving him of hypoxic drive.



[Q: 488] OnExamination - Emergency medicine

A 50-year-old lady presented to the Emergency Department with cough and dyspnoea for the past two days. She is previously well. She smokes 20 cigarettes per day.

She has a temperature of 38.3oC and is agitated and confused. Her pulse is 110/min and her blood pressure is 88/60 mmHg. Her oxygen saturation is 89% on air and she has a respiratory rate of 40/min. Chest x-ray shows left basal consolidation. Results show:

Sodium	143 mmol/l	(133-144)
Potassium	3.8 mmol/l	(3.5-5.5)
Urea	9.2 mmol/l	(3-8)
Creatinine	85 micromol/l	(50-100)

Her CURB score is documented and she is admitted to hospital with severe pneumonia.

Which of the following would count towards her CURB score?

- 1- Consolidation on Chest X-Ray

- 2- Oxygen saturation
- 3- Peak expiratory flow rate
- 4- Raised blood urea
- 5- Temperature

Answer & Comments

Answer: 4- Raised blood urea

The CURB score is calculated by assessment of Core Adverse Prognostic Features which are used in assessment of severity of pneumonia. Two from 4 features indicate a severe pneumonia and hospital admission is advised.

The CURB score is calculated using

- 1. Confusion abbreviated mental test score < 8
- 2. Urea > 7mmol/l
- 3. Respiratory rate > 30/min
- 4. Blood Pressure Systolic BP < 90 or diastolic BP < 60.



[Q: 489] OnExamination -
Emergency medicine

In considering the management of convulsions select the correct statement from the list below.

- 1- If the fit lasts longer than 5 minutes, then PR diazepam should be given.
- 2- Phenobarbitone is a useful therapy in school age children.
- 3- Paraldehyde is best given intramuscularly.
- 4- Hypoglycaemia should always be considered.
- 5- When associated with fever, antibiotics should always be given to cover the possibility of meningitis.

Answer & Comments

Answer: 4- Hypoglycaemia should always be considered.

Status epilepticus is defined as continuous convulsion lasting greater than 30 minutes, or the occurrence of serial convulsions between which there is no return of consciousness. It may be generalised (tonic clonic, absent) or partial (simple, complex, or with secondary generalisation). Generalised tonic clonic seizures predominate. There are 3 major sub-types:

- " Prolonged febrile seizures.
- " Idiopathic status epilepticus (no underlying CNS lesion or insult).
- " Symptomatic (long-standing neurological disorder or metabolic abnormality).

The commonest cause in a child less than 3 years is a prolonged febrile seizure. Sleep deprivation and drug withdrawal can also precipitate it. The relationship between neurological outcome and duration of status epilepticus is unknown in children and adults. In the animal model, 60 minutes of constant seizure activity is associated with pathological changes, even when metabolic homeostasis is maintained. Cell death thus results in increased metabolic demands from continually discharging neurones. Vulnerable areas include the hippocampus, the mid to low cerebellum, middle cortical areas, and thalamus. Approximately, 20 minutes of status epilepticus produces regional oxygen sufficiency promoting cell damage and necrosis. This is, therefore, used as the threshold in children. Initial management begins with ABC. Hypoglycaemia should be excluded (if present 5ml/kg of 10% dextrose is given by IV infusion), and blood obtained for full blood count, electrolytes including calcium and magnesium, glucose, creatinine, anticonvulsant levels. Blood and urine may be obtained for toxicology. Arterial blood gases should be done, and consideration given to lumbar puncture.

First line anticonvulsant therapy would be diazepam given IV if possible. If seizures persist then phenytoin may be given as a loading dose followed by an infusion. Phenobarbitone may be used as first line in infants. Paraldehyde can be given as a dilute solution intravenously, or administered rectally or IM. The latter 2 routes can produce tissue damage and sloughing, so these should be reserved for exceptional circumstances.



[Q: 490] OnExamination -
Emergency medicine

A 29-year-old woman presents with a 4 month history of malaise, diarrhoea and a 6kg weight loss. On examination there is lymphadenopathy and oesophageal candidiasis.

What is the likely diagnosis?

- 1- Infectious mononucleosis
- 2- HIV
- 3- Hodgkins lymphoma
- 4- Sarcoid
- 5- Toxoplasmosis

Answer & Comments

Answer: 2- HIV

The absence of night sweats makes a diagnosis of lymphoma unlikely. Toxoplasmosis is not associated with diarrhoea. IM would normally be associated with sore throat, often in a younger patient. Lymphadenopathy is very common in HIV, oesophageal candidiasis results from immunosuppression, weight loss is clearly consistent with the diagnosis, and diarrhoea may result from any number of pathogens in HIV.



[Q: 491] OnExamination -
Emergency medicine

A 55-year-old homeless male was found

stuporose and smelling of alcohol.

Observations in A&E reveal a core temperature of 34°C, a pulse of 50 bpm and blood pressure of 116/80 mmHg. Dipstick urine analysis shows Blood +++. Some of his investigations are listed:

Creatinine 320 µmol/L (60-110)

Gamma GT 40 U/L (10-40)

AST 550 U/L (1-40)

LDH 1500 U/L (10-250)

" Urine microscopy no cells or organisms

What is the most likely cause of the raised serum creatinine concentration?

- 1- Chronic renal failure
- 2- Dehydration
- 3- Hypothermia
- 4- Paracetamol poisoning
- 5- Rhabdomyolysis

Answer & Comments

Answer: 5- Rhabdomyolysis

The elevated serum creatinine is most likely due to Rhabdomyolysis as the patient was found unconscious hypothermic and is likely to have sustained muscle injury. The latter is confirmed by an elevated aspartate aminotransferase and LDH but the normal GGT argues against these being released from the liver.

Rhabdomyolysis is strongly suggested by the fact that urinalysis is strongly positive for blood whereas urine microscopy is negative for red blood cells. The positive urinalysis is caused by myoglobin a muscle protein released during muscle damage this appears in the urine and can cause acute renal failure.



[Q: 492] OnExamination -
Emergency medicine

A 70-year-old woman presented with an acute, severe occipital headache, unsteadiness of her gait and vomiting. She had a history of poorly controlled hypertension. On examination there was nystagmus to the left, ataxia of the left limbs and gait ataxia.

What is the most likely diagnosis?

- 1- acute cerebellar haemorrhage
- 2- basal ganglia haemorrhage
- 3- pontine haemorrhage
- 4- subdural haemorrhage
- 5- temporal lobe haemorrhage

Answer & Comments

Answer: 1- acute cerebellar haemorrhage

Cerebellar hemorrhage: The most common symptoms are of severe nausea and vomiting and ataxia. Headache may be severe. Patients with cerebellar hemorrhage can rapidly become comatose within hours after the onset from herniation, because of its limited space in the posterior fossa

Pontine hemorrhage: There are numerous nuclei located within the pons. Rapidly deteriorating level of consciousness, impaired extraocular movement and extensive sensorimotor deficits are clinical clues to pontine hemorrhage.

Basal Ganglia haemorrhage: Contralateral hemiparesis, hemisensory loss, or hemi-inattention. Aphasia, especially nonfluency and impaired comprehension, is frequently seen if haemorrhage occurs in the posterior limb of the left internal capsule.



[Q: 493] OnExamination -
Emergency medicine

A 42-year-old woman presents with an acute attack of asthma. She is able to speak in short

sentences.

Her respiratory rate is 28 breaths per minute and the peak expiratory flow rate 120L/min (predicted 480 L/min).

What is the most appropriate treatment for this patient?

- 1- Intravenous aminophylline.
- 2- Intravenous salbutamol
- 3- Nebulized salbutamol
- 4- Oral salbutamol
- 5- Oral theophylline

Answer & Comments

Answer: 3- Nebulized salbutamol

This patient has features of acute severe asthma, and should be given oxygen, steroids and nebulised salbutamol as immediate treatment. Although the PFR is less than 33% of predicted normal (feature of life threatening attack), we do not know what her previous best is. It could be low eg 240L/min. If it had been a life threatening attack, nebulised ipratropium and iv aminophylline, salbutamol or terbutaline should be given. The guidelines do not specify a preference. This is another clue that the answer should be nebulized salbutamol.



[Q: 494] OnExamination -
Endocrinology

A 20-year-old man with asthma was found to be hypertensive. Investigations revealed:

Serum sodium 144 mmol/L (137-144)

Serum potassium 2.4 mmol/L (3.5-4.9)

Serum bicarbonate 30 mmol/L (20-28).

Which one of the following is the most likely diagnosis?

- 1- Bartter's syndrome
- 2- Coarctation of the aorta
- 3- Congenital Adrenal Hyperplasia
- 4- Conn's Syndrome
- 5- Inhaled Salbutamol therapy

Answer & Comments

Answer: 4- Conn's Syndrome

This is a tough question as a number of answers are possible. This young asthmatic has a hypokalaemic hypertension and I'm assuming that his hypertension is sustained. This would therefore suggest a secondary cause which may be either hyperaldosteronism or pseudohyperaldosteronism. A rare CAH (11-beta hydroxysteroid dehydrogenase (11-BHSD) deficiency) may be responsible for hypokalaemic hypertension and the presentation is variable ranging from birth to adulthood but typically birth. Bartter's syndrome is not associated with hypertension. Conn's syndrome is usually found in middle aged patients and would be unusual in a patient of this age but even so is probably the best answer here. Liquorice ingestion could again fit this picture but would again be somewhat unusual in this patient. Salbutamol may cause hypokalaemia particularly when given via nebuliser or particularly iv but should not produce hypertension.



[Q: 495] OnExamination -
Endocrinology

A 33-year-old female presents with a one year history of galactorrhoea and amenorrhoea. She informs you that she does not want to become pregnant. On examination there is galactorrhoea to expression and visual fields are normal to confrontation.

Investigations confirm the diagnosis of a macroprolactinoma, with a prolactin concentration of 10,500 mu/l (50-500) and MRI of the pituitary revealing a 1.5 cm tumour with some suprasellar extension.

What is the most appropriate treatment for this woman?

- 1- Cabergoline therapy
- 2- Combined oral contraceptive
- 3- Pituitary surgery
- 4- Somatostatin analogue therapy
- 5- Stereotactic pituitary irradiation

Answer & Comments

Answer: 1- Cabergoline therapy

This young woman has a macroprolactinoma and these are exquisitely sensitive to dopamine agonist therapy and rapid tumour reduction with restoration of menses and cessation of galactorrhoea expected. Pituitary surgery is rarely required in prolactinomas and is generally reserved for patients intolerant or resistant to dopamine agonist therapy. Even with large tumours that compress the chiasm, these can be treated with dopamine agonists with rapid reduction in size and relief of pressure. The fact that she does not want to become pregnant is a bit of an irrelevance. One would still treat her with dopamine agonist therapy and suggest use of appropriate contraception which could include the OCP.



[Q: 496] OnExamination -
Endocrinology

Which of the following statements concerning transferrin is correct?

- 1- Transferrin levels fall during pregnancy
- 2- Transferrin binds ferrous iron
- 3- In the absence of anaemia, transferrin is 80% saturated with iron
- 4- Levels are elevated in haemochromatosis
- 5- Levels are elevated in patients on the oral contraceptive pill

Answer & Comments

Answer: 5- Levels are elevated in patients on the oral contraceptive pill

Pregnancy and the OCP both increase transferrin levels. Iron is carried in the blood bound to transferrin. Fe²⁺ (ferrous iron) is oxidised to Fe³⁺ (ferric iron) by caeruloplasmin to bind to transferrin which is about one third saturated with iron. The saturation of TIBC (plasma iron concentration/TIBC x 100) is used as a measure of iron stores. A value below 16% is indicative of iron deficiency. The transferrin level and the TIBC rise in iron deficiency. Pregnancy and the OCP both increase transferrin levels. Whereas transferrin and TIBC fall in iron overload, percentage saturation is increased in haemochromatosis.



[Q: 497] OnExamination -
Endocrinology

A 55-year-old male presents with anorexia and weight loss of 12 months duration. Over this year he has had two deep vein thromboses and had the last whilst his INR was 2. He remains on long-term warfarin therapy with an INR above 2.6. Examination reveals that he is pigmented and has a postural drop in his blood pressure of 15 mmHg.

Investigations are as follows:

sodium concentration 131 mmol/l

potassium 5.0 mmol/l

INR 3.0

A Short synacthen test reveals a baseline cortisol concentration at time 0 of 120 nmol/l which rises to 155 nmol/l after 30 minutes (Normal response >550 nmol/l).

Which single diagnosis would explain this patient's illness?

- 1- Addison's disease
- 2- Anti-phospholipid syndrome
- 3- Autoimmune Polyendocrine Syndrome (Schmidt's disease)
- 4- Protein S deficiency
- 5- Pituitary infarction

Answer & Comments

Answer: 2- Anti-phospholipid syndrome

With a history of recurrent DVT and confirmed hypoadrenalism this patient is likely to have the antiphospholipid syndrome. Antiphospholipid syndrome is a primary diagnosis or may co-exist with SLE. Anti-Cardiolipin antibodies or Lupus anticoagulant may be present. It is associated with arterial and venous thrombosis and has a predilection for the adrenal veins causing adrenal infarction with consequent hypoadrenalism. Addison's disease is an autoimmune phenomenon and is not associated with DVT. The pigmentation (due to increased ACTH in hypoadrenalism) would exclude pituitary infarction as the cause of the hypoadrenalism. Hypoadrenalism is not associated with protein S deficiency. Autoimmune Polyendocrine syndrome is associated with hypothyroidism, type 1 diabetes, addison's disease.



[Q: 498] OnExamination -
Endocrinology

A 21-year-old woman is known to suffer from anorexia nervosa.

Which of the following metabolic disturbances would be a characteristic finding?

- 1- a decrease in Cortisol levels
- 2- an increase in LH levels
- 3- hyperkalaemia
- 4- impaired glucose tolerance
- 5- raised androgen levels

Answer & Comments

Answer: 4- impaired glucose tolerance

Malnutrition is another cause of diabetes. (Can you name the others? ... Type 1 and Type 2 OK ... but what about gestational or post pancreatitis / pancreatectomy ... do you know the others?)

Cortisol and growth hormone levels are elevated.

LH and FSH would be low and LH response to LHRH is impaired when weight loss is severe.

Hypokalaemia (not hyperkalaemia may be seen). Also there may be hypoalbuminaemia, anaemia, leukopenia, and raised serum carotene.



[Q: 499] OnExamination - Endocrinology

Causes of hypoadrenalism include:

- 1- Hughes' syndrome (anti-phospholipid antibody)
- 2- MEN type 2a
- 3- VonHippel-Lindau
- 4- Pendred's syndrome
- 5- McArdle's syndrome

Answer & Comments

Answer: 1- Hughes' syndrome (anti-phospholipid antibody)

The anti-phospholipid syndrome is one of the commoner causes of Hypoadrenalism and

may precipitate adrenal infarction and haemorrhage through adrenal vein thrombosis.



[Q: 500] OnExamination - Endocrinology

Which ONE of the following concerning Insulin is correct?

- 1- acts via a similar mechanism as steroid receptors
- 2- causes an increased glucose-protein transport on the endoplasmic reticulum
- 3- can be detected in the lymph
- 4- interacts with the nuclear membrane
- 5- is synthesised in the alpha cells of islets of Langerhans

Answer & Comments

Answer: 3- can be detected in the lymph

a-Cell surface receptors.

Insulin binding to its receptor results in receptor autophosphorylation on tyrosine residues and the tyrosine phosphorylation of insulin receptor substrates (IRS-1, IRS-2 and IRS-3) by the insulin receptor tyrosine kinase.



[Q: 501] OnExamination - Endocrinology

Which of the following is not a feature of Zinc deficiency?

- 1- dwarfism
- 2- geophagia
- 3- hepatosplenomegaly
- 4- hypertelorism
- 5- hypogonadism

Answer & Comments

Answer: 4- hypertelorism

Zinc deficiency is associated with dwarfism, hypogonadism, hepatosplenomegaly, rough and dry skin, mental lethargy and geophagia. Zn supplementation has also been shown to improve neuropsychological function in Chinese children, and Zn deficiency is associated with adverse pregnancy outcomes.



[Q: 502] OnExamination - Endocrinology

Which of the following is correct concerning Nitric Oxide:

- 1- Is synthesised principally by the vascular smooth muscle
- 2- Acts via cAMP as the second messenger
- 3- Is manufactured from Glycine
- 4- Is inactivated by superoxide dismutase
- 5- Inhibits platelet aggregation

Answer & Comments

Answer: 5- Inhibits platelet aggregation

Nitric Oxide is a free radical that is produced from L-arginine by nitric oxide synthase in the vascular endothelium. It is anti-atherogenic, causing vasorelaxation, inhibiting platelet aggregation and foam cell formation.



[Q: 503] OnExamination - Endocrinology

Primary hyperparathyroidism may occur in association with the following conditions

- 1- Chronic renal failure
- 2- Vitamin D deficiency
- 3- Gastrinoma
- 4- Autoimmune polyendocrine syndrome
- 5- Sjogren's syndrome

Answer & Comments

Answer: 3- Gastrinoma

The association of primary hyperparathyroidism and a gastrinoma would suggest a diagnosis of multiple endocrine neoplasia type 1. CRF causes secondary or tertiary hyperparathyroidism, with vit D deficiency causing secondary hyperparathyroidism. There is no association with Sjogren's.



[Q: 504] OnExamination - Endocrinology

Which of the following techniques would be most useful in the differential diagnosis between ectopic Cushing's syndrome and pituitary dependent Cushing's disease.

- 1- Urine free cortisol
- 2- High dose Dexamethasone suppression test
- 3- ACTH concentrations
- 4- Inferior petrosal sinus sampling
- 5- CRF test

Answer & Comments

Answer: 4- Inferior petrosal sinus sampling

Inferior petrosal sinus sampling with an elevated central ACTH concentration compared with the peripheral value is the most valuable test in the differential diagnosis of either Cushing's disease or ectopic Cushing's syndrome. The other tests are far less useful in comparison.



[Q: 505] OnExamination - Endocrinology

Which of the following suggests a poorer prognosis for thyroid cancer.

- 1- Papillary thyroid cancer with cervical node involvement.
- 2- Male sex.
- 3- Age less than 30.
- 4- Cold nodule on thyroid uptake scan
- 5- High TSH concentration

Answer & Comments

Answer: 2- Male sex.

Factors that suggest a poor prognosis in thyroid cancer include increasing age, male sex, poorly differentiated histological features and distant spread.



[Q: 506] OnExamination - Endocrinology

A 40-year-old man is undergoing investigation for acromegaly. MRI of the pituitary fossa is normal, but a routine chest x-ray reveals a large centrally based mass. The patient is a non-smoker.

What is the most likely type of this lung tumour?

- 1- Squamous cell
- 2- Small cell
- 3- Carcinoid
- 4- Large cell
- 5- Adenocarcinoma

Answer & Comments

Answer: 3- Carcinoid

A central based mass in a non-smoker showing clinical evidence of neuroendocrine cell origin is consistent with a carcinoid and surgery offers a very high chance of cure.



[Q: 507] OnExamination - Endocrinology

During routine investigation of a healthy couple for primary subfertility, semen analysis reveals azoospermia. On examination of the male there are no abnormalities on general examination and testicular examination shows a normal testicular volume.

Investigations reveal:

LH 5.1 iu/l (2-10)

FSH 4.3 iu/l (2-10)

Testosterone 15.3 nmol/l (9-30)

Which of the following is the most likely cause of his azoospermia?

- 1- Androgen insensitivity
- 2- Genital tract obstruction
- 3- Idiopathic testicular failure
- 4- Kallman's Syndrome
- 5- Sperm autoimmunity

Answer & Comments

Answer: 2- Genital tract obstruction

The normal FSH, testosterone would exclude a primary testicular cause of the azoospermia and therefore would suggest obstruction such as agenesis of the vas as seen in cystic fibrosis.



[Q: 508] OnExamination - Endocrinology

A 36-year-old male with insulin-dependent diabetes mellitus of three years duration presented with decreased libido and erectile dysfunction since diagnosis. No abnormalities were noted on genital examination. Investigations revealed:

plasma testosterone 6.0 nmol/L (9 - 35)

plasma follicle stimulating hormone 1.0 u/L (1-8)

Which of the following investigations is most appropriate next step?

- 1- autonomic function testing
- 2- Doppler studies of penile artery
- 3- Nerve conduction studies
- 4- Serum ferritin
- 5- Serum prolactin

Answer & Comments

Answer: 4- Serum ferritin

This IDDM patient appears to have hypogonadotropic hypogonadism (HH) as

reflected by low testosterone and low FSH. The combination is compatible with a diagnosis of haemochromatosis and measuring ferritin would be a reasonable investigation. Haemochromatosis typically causes hypogonadotrophic hypogonadism as a consequence of the ferritin deposition within the pituitary rather than primary testicular dysfunction. Autonomic nerve dysfunction is one of the commoner causes of impotence in a diabetic but in this case is not the cause of his HH. For similar reasons, both nerve conduction studies and dopplers are irrelevant. Prolactin would be a sensible measurement but probably if you were looking to confirm a diagnosis that incorporates the diabetes as well, Ferritin would be the investigation of choice.



[Q: 509] OnExamination - Endocrinology

A 55-year-old female undergoes a DEXA scan which reveals a bone mineral density T score of -2.55 at the hip and lumbar spine.

Which of the following may contribute to such a result?

- 1- Acromegaly
- 2- Delayed menopause
- 3- Hypothyroidism
- 4- Myeloma
- 5- Obesity

Answer & Comments

Answer: 4- Myeloma

This patient has osteoporosis as defined by her abnormally low T score. Endocrine diseases associated with osteoporosis are Cushing's disease, vitamin D deficiency, thyrotoxicosis and hypogonadism. Myeloma and lymphoma are also associated with reduced BMD. Other associates include rheumatoid arthritis, renal failure, corticosteroids, early menopause, slender

habitus, smoking, lack of exercise, family history, age/sex and excess alcohol.



[Q: 510] OnExamination - Endocrinology

Which of the following is NOT associated with hyponatraemia and hyperkalaemia?

- 1- Acute hypoadrenalism
- 2- Carbenoxolone therapy
- 3- Co-Amilorfruse therapy
- 4- Congestive cardiac failure.
- 5- Type IV renal tubular acidosis

Answer & Comments

Answer: 2- Carbenoxolone therapy

Carbenoxolone therapy may be associated with hypokalaemia and salt retention due to pseudohypoaldosteronism through inhibition of the enzyme 11 beta Hydroxysteroid dehydrogenase. Type IV renal tubular acidosis is associated with hyporeninaemic hypoaldosteronism and both hyponatraemia and hyperkalaemia can occur. Hypoadrenalism is associated with hyperkalaemia and hyponatraemia as is Cardiac failure, hepatic and renal failure. Co-amilofruse the combination of amiloride and furosemide may also produce this biochemical picture.



[Q: 511] OnExamination - Endocrinology

Which of the following is a glycoprotein hormone?

- 1- Growth hormone releasing hormone
- 2- Cortisol
- 3- Thyrotropin releasing hormone (TRH)
- 4- Thyrotropin (TSH)
- 5- Oxytocin

Answer & Comments

Answer: 4- Thyrotropin (TSH)

Thyrotropin is glycosylated, cortisol is a steroid hormone and the others are peptide hormones/neuropeptides which as a group are rarely glycosylated.



[Q: 512] OnExamination - Endocrinology

A 25-year-old nurse presents with fatigue, tremulousness and a 7kg weight loss over the past one month. On examination she has a tachycardia but no other abnormal findings. Thyroid function tests show:

free thyroxine 40 pmol/L (10-23)

TSH <0.01 mU/L (0.5-5.0)

Which one of the following would confirm the diagnosis of thyroiditis?

- 1- Elevated free T3 concentration
- 2- Failure of TSH to rise following IV TRH
- 3- High titre of thyroid peroxidase antibodies
- 4- Negligible 4 hour radioiodine thyroid uptake
- 5- Raised ESR

Answer & Comments

Answer: 4- Negligible 4 hour radioiodine thyroid uptake

This test result and symptoms may be consistent with thyroiditis such as DeQuervain's and an elevated ESR with negligible uptake of RAI (as thyroid cells are attacked and hence release stored T4 but fail to synthesise T4) would be expected. In Graves disease you would expect homogenous uptake whereas a toxic nodule would show a solitary area of high uptake. Antibodies such as TPO, and TSH receptor antibodies are found in autoimmune thyroid disease. The TRH test is seldom used except in thyroid oncology.



[Q: 513] OnExamination - Endocrinology

A 24-year-old female presents with a two week history of polyuria and polydipsia together with frequent nocturia.

Investigations show

Serum Sodium 144 mmol/l (133-144)

Serum Potassium 3.3 mmol/l (3.5-5)

Serum Calcium 2.6 mmol/l (2.2-2.6)

Plasma glucose 6.8 mmol/l (3.5-5.5)

Serum Osmolality 310 mosmol/l (275-295)

What is the diagnosis?

- 1- Diabetes Insipidus
- 2- Diabetes Mellitus
- 3- Drug abuse
- 4- Primary hyperparathyroidism
- 5- Primary polydipsia

Answer & Comments

Answer: 3- Drug abuse

This patient has polyuria and polydipsia of relative recent onset and has an elevated plasma osmolality with a high calcium and glucose concentration. These features would be unlikely in DI and are more in keeping with thiazide diuretic abuse - high calcium, glucose and hypokalaemia. Similarly, the serum osmolality would be low in association with primary polydipsia. There may be plenty of variations purely by alteration of the biochemistry of this question in the exam.



[Q: 514] OnExamination - Endocrinology

Which of the following is true of radioactive iodine (¹³¹I) therapy?

- 1- Causes hypothyroidism in 90% of treated patients within 3 months
- 2- Causes a deterioration in ophthalmopathy in patients with Graves disease

- 3- Is associated with a subsequently increased risk of infertility
- 4- Is associated with an increased risk of thyroid lymphoma
- 5- Is the preferred treatment in amiodarone induced thyrotoxicosis

Answer & Comments

Answer: 2- Causes a deterioration in ophthalmopathy in patients with Graves disease

RAI is associated with the induction of hypothyroidism in the majority of subjects by 3 months (70%) with 10% failing at the first dose at about 18 months. It may precipitate deterioration in ophthalmopathy in patients with Graves. There is no evidence of either increased risk of infertility or lymphoma after RAI with evidence suggesting that it is quite safe. Withdrawing amiodarone is the preferred treatment in amiodarone induced thyrotoxicosis and often the iodine uptake would be low in these patients making ¹³¹I therapy unhelpful.



[Q: 515] OnExamination - Endocrinology

A 17-year-old boy is brought to clinic as his parents are concerned regarding possible delayed puberty. He was otherwise well, played sports regularly and academic performance was good. His height was 1.7m and weight was 70kg.

On examination he had small penis and testes, absent pubic hair, but no other abnormalities. Investigations revealed:

Serum testosterone 4 nmol/L (9-35)
 Plasma follicle stimulating hormone (FSH) 1 U/L (1-7)
 Plasma luteinising hormone (LH) 1 U/L (1-10)
 Plasma prolactin 300 mU/L (<450)
 Plasma TSH 2 mU/L (0.5-5)

Which one of the following is the most likely cause?

- 1- Constitutional delay
- 2- Hypopituitarism
- 3- Hypothyroidism
- 4- Kallman's syndrome
- 5- Klinefelter's syndrome

Answer & Comments

Answer: 4- Kallman's syndrome

The low FSH and LH, together with the low testosterone, suggests a hypogonadotrophic hypogonadism. We know that there is no mental retardation, and we are told that physical examination is normal and sense of smell would usually not be tested.

Consequently a diagnosis of Kallman's is suggested. We are not told of a family history of growth delay, thus this is unlikely to be constitutional delay. The TSH is normal, making hypothyroidism unlikely and this together with the normal prolactin make hypopituitarism most unlikely.



[Q: 516] OnExamination - Endocrinology

A 29-year-old female presents with headaches. She is noted to be hypertensive with a blood pressure of 180/100 mmHg and initial investigations reveal a hypokalaemia of 2.9 mmol/l. On closer questioning she is found to consume a large quantity of licquorice.

Inhibition of which enzyme is responsible for the pseudohyperaldosteronism associated with Liquorice.

- 1- 5 alpha-reductase
- 2- 21 Hydroxylase
- 3- 11 betaHydroxysteroid dehydrogenase (11 bHSD)
- 4- 17 alpha hydroxylase (17aOH)
- 5- 11 beta hydroxylase (11 bOH)

Answer & Comments

Answer: 3- 11 betaHydroxysteroid dehydrogenase (11 bHSD)

11bHSD is responsible for the conversion of cortisol to the inactive cortisone, preventing activation of the mineralocorticoid receptor by cortisol but permitting activation by aldosterone. Both Liquorice and carbenoxolone inhibit 11bHSD and produce pseudohyperaldosteronism with hypertension and hypokalaemia yet appropriately low renin and aldosterone concentrations. Much research is focussed upon this enzyme of late.



[Q: 517] OnExamination - Endocrinology

A 60-year-old man is admitted with a productive cough with flecks of blood in his sputum. Chest X-ray reveals a mass lesion in the right mid zone.

Investigations reveal:

sodium 110 mmol/L (137-144)

potassium 4.0 mmol/L (3.5-4.9)

bicarbonate 24 mmol/L (20-28)

urea 3.0 mmol/L (2.5-7.5)

creatinine 80 umol/L (60-110)

Which of the following findings suggest a diagnosis of the syndrome of inappropriate ADH (SIADH) secretion?

- 1- Presence of ascites
- 2- Plasma osmolality 236 mosmol/kg (278-305)
- 3- urine flow rate 20 mL/hour
- 4- urine osmolality 250 mosmol/kg (350-1000)
- 5- urine sodium 110 mmol/L

Answer & Comments

Answer: 5- urine sodium 110 mmol/L

The serum osmolality associated with hyponatraemia is generally low and so would

not in itself suggest SIADH. However, in the context of the low plasma osmolality a high urine osmolality (2x that of the plasma osmolality) with an elevated urine sodium (above 20 mmol/l) is suggestive of this diagnosis.



[Q: 518] OnExamination - Endocrinology

A 54-year-old male who is a HGV driver and has a 10 year history of type 2 diabetes is seen on annual review. His glycaemic control is poor with a HBA1c of 10.5% on maximal oral hypoglycaemic therapy. You suggest switching to insulin but he refuses to do this as he would lose his HGV licence.

He also refuses to inform the DVLA himself, what is the most appropriate action in this case?

- 1- Continue to review patient in clinic and accept that he continues to drive.
- 2- Discharge him from clinic as there is nothing more that you can do.
- 3- Inform the DVLA even if the patient withholds his consent.
- 4- Inform his employer that he must stop driving and suggest administrative work.
- 5- Tell his next of kin that they should inform the DVLA that he is no longer fit to drive.

Answer & Comments

Answer: 1- Continue to review patient in clinic and accept that he continues to drive.

In this particular case, the patient has poor glycaemic control but otherwise has no features whatsoever that preclude him from driving such as retinopathy, neuropathy or hypoglycaemic episodes. You cannot therefore force this patient to switch to insulin and neither can you stop him driving. He will continue to regular a medical every three years for his continued HGV licence.



[Q: 519] OnExamination -
Endocrinology

Which of the following features would be expected on lipid analysis in a 57-year-old female with two year history of primary biliary cirrhosis?

- 1- A lipaemic appearance of the serum would be expected.
- 2- is treated with clofibrate therapy
- 3- is characteristically associated with tendon xanthomas
- 4- is characteristically associated with palmar xanthomas
- 5- No evidence of a dyslipidaemia would be expected with this short a duration of disease

Answer & Comments

Answer: 4- is characteristically associated with palmar xanthomas

In prolonged cholestasis features include: increased serum cholesterol, a moderate increase in triglyceride, the serum is not lipaemic, and reduced HDL levels. Clinical features include: palmar xanthomas; tuberous xanthomas (particularly on extensor surfaces); tendinous xanthomas are rare. Xanthomas usually only occur if cholestasis has persisted for more than 3 months sometimes fat deposits may involve bone and peripheral nerves.



[Q: 520] OnExamination -
Endocrinology

Which of the following statements is correct concerning the relationship between Type 2 Diabetes and colonic cancer?

- 1- The increased risk of colorectal cancer in diabetes is related to BMI
- 2- The increased risk of colorectal cancer in diabetes is related to total cholesterol

- 3- Increased concentrations of C-peptide are a marker of increased colorectal cancer risk
- 4- Insulin treatment increases recurrence-free survival after treatment of colonic cancer
- 5- Type 1 diabetes has similar risks of colonic cancer as does type 2 diabetes

Answer & Comments

Answer: 3- Increased concentrations of C-peptide are a marker of increased colorectal cancer risk

Type 2 diabetes is associated with a 40-60% increase in the risk of cancer of the large bowel. This increase is linked to changes in HbA1c. Type 2 diabetes is associated with significantly higher rates of overall mortality and reduced disease free and recurrence free survivals after chemotherapy/radiotherapy, and insulin has not been shown to have any effects on mortality. No association has been found between colonic malignancy and type 1 diabetes, nor gestational diabetes. For a discussion see BMJ 2005;330:551-2.



[Q: 521] OnExamination -
Endocrinology

A 25-year-old female presents with weight gain, oligomenorrhoea and primary infertility. She has a history of bipolar disorder for which she takes Lithium. On examination she has a BMI of 32 kg/m².

Investigations reveal:

Free T₄ 6.4 nmol/l (9-23)

TSH 42 mu/l (0.5 - 5)

Prolactin 980 mu/l (50-450)

What is the most appropriate treatment for this patient?

- 1- Cabergoline
- 2- Cabergoline plus thyroxine
- 3- Metformin
- 4- Thyroxine

5- Stop Lithium

Answer & Comments

Answer: 4- Thyroxine

This patient has primary hypothyroidism which would explain the increasing weight and the associated hyperprolactinaemia. The latter occurs as a consequence of reduced dopaminergic tone. The most appropriate treatment for her would be thyroxine which would through euthyroidism be expected to normalise prolactin concentration. In turn this may improve weight, menstrual function and fertility.



[Q: 522] OnExamination - Endocrinology

A 60 year female presents with vague aches and pains and has a family history of osteoporosis. She is 10 years post-menopausal but has not taken any female HRT. Dual energy X-ray absorptiometry (DEXA) is requested.

Which of the following values of bone mineral density measured by DEXA would signify osteopaenia at a measured site?

- 1- A T score of -2.6
- 2- A T score of -1.8
- 3- A Z score of -2.0
- 4- A z score of -1.5
- 5- A T score of -0.9

Answer & Comments

Answer: 2- A T score of -1.8

Osteopaenia is defined as a T score of between -1 and -2.5 standard deviations below the bone mineral density of a young female. Osteoporosis is defined as <-2.5 SD. These measurements are important as they signify a greatly increased risk of fracture. Z scores refer to the bone mineral density

compared with that of a 'normal' age matched subject.



[Q: 523] OnExamination - Endocrinology

A 60 year female presents with vague aches and pains and has a family history of osteoporosis. She is 10 years post-menopausal but has not taken any female HRT. Dual energy X-ray absorptiometry (DEXA) is requested.

Which of the following values of bone mineral density measured by DEXA would signify osteopaenia at a measured site?

- 1- A T score of -2.6
- 2- A T score of -1.8
- 3- A Z score of -2.0
- 4- A z score of -1.5
- 5- A T score of -0.9

Answer & Comments

Answer: 2- A T score of -1.8

Osteopaenia is defined as a T score of between -1 and -2.5 standard deviations below the bone mineral density of a young female. Osteoporosis is defined as <-2.5 SD. These measurements are important as they signify a greatly increased risk of fracture. Z scores refer to the bone mineral density compared with that of a 'normal' age matched subject.



[Q: 524] OnExamination - Endocrinology

Which ONE of the following is true concerning Antidiuretic hormone (ADH)?

- 1- Carbamazepine potentiates its release
- 2- Ethanol potentiates its release
- 3- It circulates in the blood bound to neurohypophysin
- 4- It is a cyclic octapeptide

5- It is synthesised in the posterior pituitary

Answer & Comments

Answer: 1- Carbamazepine potentiates its release

ADH is a nonapeptide manufactured in the paraventricular and supra-optic nuclei of the hypothalamus and released from the posterior pituitary. It acts on the collecting ducts improving water permeability and hence water retention. Carbamazepine as well as other agents such as thiazides and SSRIs may potentiate its release. Ethanol usually inhibits release.



[Q: 525] OnExamination - Endocrinology

A 47-year-old schoolteacher presents to her GP with fatigue. The GP noted her to be hypercalcaemic with an albumin of 39 g/l, globulin 28g/l and Ca ++ of 2.80.

Which of the following statements is true?

- 1- 24 hour urinary calcium assay is of no use at all.
- 2- Primary hyperparathyroidism will be diagnosed only if the PTH is at least three times the normal range.
- 3- Modern assays for PTH and PTHrP should may cross-react so that assays are unreliable.
- 4- The patient could have surgery if renal stones are found on ultrasound
- 5- The most likely diagnosis is myeloma.

Answer & Comments

Answer: 4- The patient could have surgery if renal stones are found on ultrasound

24hr urinary calcium may be useful if used in comparison to the serum calcium in order to distinguish familial hypocalciuric hypercalcaemia from primary hyperparathyroidism. PTH may be less than

twice the upper limit of normal in primary hyperparathyroidism. Several indications for surgery exist including calcium >1mg/dl above upper normal limit, greater than 30% decline in renal function, renal stones, Age<50, unwillingness of patient to follow advice of medical surveillance. Myeloma is unlikely given the normal immunoglobulins.



[Q: 526] OnExamination - Endocrinology

Osteomalacia may be expected in

- 1- Sarcoidosis
- 2- Auto-immune adrenalitis
- 3- Pseudo-hypoparathyroidism
- 4- Pernicious anaemia
- 5- Mercury poisoning

Answer & Comments

Answer: 5- Mercury poisoning

Osteomalacia may occur with vitamin D deficiency. Mercury poisoning or any heavy metal poisoning causes an acquired Fanconi syndrome with distal renal tubular acidosis.



[Q: 527] OnExamination - Endocrinology

A 73-year-old female is diagnosed with Cushing's disease.

Which of the following is correct?

- 1- Adrenalectomy would be the treatment of choice.
- 2- op-DDD is a treatment if unfit for surgery
- 3- Ketoconazole may be used as a treatment if unfit for surgery
- 4- Recurrence of Cushing's disease after transphenoidal surgery is less than 5%
- 5- yttrium implantation is an effective treatment

Answer & Comments

Answer: 3- Ketoconazole may be used as a treatment if unfit for surgery

Transphenoidal hypophysectomy/adenomectomy would be the initial treatment of choice. Laparoscopic adrenalectomy would be advised where pituitary surgery has failed. Ketoconazole may be an effective treatment for patients unfit for surgery. opDDD is used for adrenal carcinomas. Yttrium implantation has been abandoned even for acromegaly as is pretty useless. The recurrence rate for Cushing's disease after surgery is of the order of 20-30% in most series and depends on the size of the tumour with macroadenomas having a higher rate of relapse.



[Q: 528] OnExamination - Endocrinology

A 28-year-old female is referred with a three month history of tiredness and weakness. On examination, pulse is 82 bpm and blood pressure is 128/72 mmHg. No specific abnormalities are evident on examination of the cardiovascular, respiratory, abdominal or neurological systems. Investigations reveal:

Serum Sodium 142 mmol/l (134-144)

Serum Potassium 3.0 mmol/l (3.5-5)

Serum Urea 4.2 mmol/l (3-8)

Serum Creatinine 82 µmol/l (50-100)

Serum Chloride 73 mmol/l (95-107)

Plasma Glucose 5.5 mmol/l (3.5-5.5)

Urinary chloride 60 mmol/l (20 - 350)

Which of the following is the likely diagnosis?

- 1- Bartter's syndrome
- 2- Conn's syndrome
- 3- Drug ingestion
- 4- Liddle's syndrome
- 5- Non classical Congenital adrenal hyperplasia

Answer & Comments

Answer: 3- Drug ingestion

This young woman has hypokalaemia and hypochloraemia. The normal blood pressure would exclude a diagnosis of Conn's, CAH, or Liddle's syndrome (apparent mineralocorticoid excess). Similarly, drug ingestion associated with hypokalaemia - licquorice/carbenoxolone - is again associated with hypertension (and low urinary chloride < 20 mmol/L). Bartter's syndrome is a rare, recessive condition associated with weakness, lethargy and growth retardation and is found in youngsters. Hypokalaemic hypochloareamic alkalosis is seen in the condition but symptoms would be more apparent at a much younger age than this woman. If Gitelman's syndrome were offered then that would be a better option. Therefore, the most likely diagnosis as the symptoms have arisen only over the last three months and no other features are apparent on examination is diuretic abuse.



[Q: 529] OnExamination - Endocrinology

A previously fit 47-year-old male presents with lower back pain from a vertebral collapse due to osteoporosis.

Which of the following investigations would be the most appropriate for this man?

- 1- oestrogen concentration
- 2- prostate-specific antigen concentration
- 3- prolactin concentration
- 4- testosterone concentration
- 5- thyroid function tests

Answer & Comments

Answer: 4- testosterone concentration

Osteoporosis in a young male would be unusual. Any symptoms or features of hypogonadism or hypercalcaemia should be

elicited. Hyperprolactinaemia causes hypogonadism so a testosterone concentration would be far more relevant. Hyperthyroidism would need to be present for a considerable length of time before producing osteoporosis. Hypogonadism often goes unnoticed. Prostate malignancy does not cause osteoporosis.



[Q: 530] OnExamination - Endocrinology

The thyroid hormone receptor is:

- 1- A gated ion channel
- 2- A cell surface receptor
- 3- A cytoplasmic protein
- 4- A G-protein coupled receptor
- 5- A nuclear receptor

Answer & Comments

Answer: 5- A nuclear receptor

The thyroid hormone receptor is a nuclear receptor. When it binds T3 it is able to bind to the thyroid hormone response element (TRE) in the promoter region of thyroid hormone responsive genes and initiates transcription.



[Q: 531] OnExamination - Endocrinology

Which ONE of the following is a recognised feature of achondroplasia?

- 1- Autosomal recessive inheritance
- 2- May be diagnosed radiologically at birth
- 3- Increased liability to pathological fractures
- 4- Shortened spine
- 5- Subfertility

Answer & Comments

Answer: 2- May be diagnosed radiologically at birth

ACHONDROPLASIA is an autosomal dominant condition and one of the commonest forms of inherited dwarfism. Epiphyseal dysplasia - thin zone of cartilage cells, diminished columnar arrangement short thick bones, spinal length almost always normal. Features - short limbs, normal trunk, large head, saddle nose, exaggerated lumbar lordosis normal mental and sexual development, spinal problems. Homozygotes - neonatal death (Harrisons)



[Q: 532] OnExamination - Endocrinology

A 70-year-old woman is referred by a with a breast lump. She was asymptomatic but her investigations reveal:

Corrected calcium 2.72 mmol/L (2.2 - 2.6)

Phosphate 0.80 mmol/L (0.8-1.4)

Alkaline phosphatase 110 U/L (20 - 95)

PTH concentration 5.1 pmol/L (0.9-5.4)

What is the most likely diagnosis?

- 1- bony metastases
- 2- chronic vitamin D excess
- 3- ectopic PTH related peptide (PTHrp) secretion
- 4- multiple myeloma
- 5- primary hyperparathyroidism

Answer & Comments

Answer: 5- primary hyperparathyroidism

This patient has hypercalcaemia with a lowish phosphate concentration but an inappropriately normal PTH concentration suggesting hyperparathyroidism which is a relatively common disorder amongst elderly females. The story of the breast lump in this case is endeavouring to throw the candidate. Vitamin D excess would be expected to cause an elevated Phosphate.



[Q: 533] OnExamination -
Endocrinology

Which of the following is true concerning a 68-year-old male with type 2 diabetes diagnosed with type IV renal tubal acidosis?

- 1- Aminoaciduria would be expected.
- 2- Fludrocortisone treatment is effective
- 3- Increased Glomerular filtration rate is expected.
- 4- Increased urinary bicarbonate would be expected.
- 5- Normal renal handling of K⁺ and H⁺

Answer & Comments

Answer: 2- Fludrocortisone treatment is effective

H⁺ secretion, sodium reabsorption and ammonia production diminishes. RTA 4 is in effect hyporeninaemic hypoaldosteronism or failure of aldosterone action and thus helped treated with mineralocorticoids. It is usually seen in chronic renal disease and hence low GFR and particularly. Aminoaciduria and increased urine bicarbonate are features of RTA types 1 and 2.



[Q: 534] OnExamination -
Endocrinology

Adult growth hormone deficiency is confirmed by:

- 1- A low IGF-1 concentration
- 2- An undetectable random Growth hormone concentration.
- 3- Suppression of GH below 2 mU/l (1.3 microg/l) with an oral glucose tolerance test
- 4- A peak growth hormone concentration of 6 mU/l (2 microg/l) with insulin induced hypoglycaemia
- 5- A low IGF binding protein-3 (IGFBP3) concentration

Answer & Comments

Answer: 4- A peak growth hormone concentration of 6 mU/l (2 microg/l) with insulin induced hypoglycaemia

The diagnosis of adult GHD depends on a peak GH response of less than 9 mU/l to insulin induced hypoglycaemia.



[Q: 535] OnExamination -
Endocrinology

Which of the following concerning Diabetic retinopathy is correct?

- 1- Is unusual in type 2 diabetic patients
- 2- Improved glycaemic control is more effective than hypertensive control in reducing progression of disease.
- 3- Normal visual acuity is seen in Proliferative retinopathy.
- 4- Progression may be reduced statin therapy
- 5- Soft exudates are a feature of background retinopathy.

Answer & Comments

Answer: 3- Normal visual acuity is seen in Proliferative retinopathy.

Diabetic retinopathy occurs in both type 1 and 2 DM and may be a presenting feature in Type2 as the condition may have existed for many years prior to diagnosis. Progression may be slowed with improved glycaemic and hypertensive control but the latter has been shown to be more effective at reducing progression (UKPDS). There are no data at present to suggest that Statin therapy reduces disease progression. Soft exudates are a feature of pre-proliferative Rn and despite quite marked new vessel disease the visual acuity may be normal.



[Q: 536] OnExamination -
Endocrinology

A 65-year-old male undergoes a CT headscan

after falling from a ladder and knocking himself out. The CT report reveals that he has a 1.3 cm macroadenoma which does not encroach upon the optic chiasm. On recovery he is perfectly well and examination is entirely normal, including full visual fields to confrontation.

Investigations reveal normal thyroid function, testosterone concentration and short synacthen test results. His prolactin concentration is 550 $\mu\text{U/L}$ (NR 50-450).

What is the most appropriate treatment for this patient?

- 1- Advise trans-sphenoidal hypophysectomy
- 2- Arrange pituitary radiotherapy
- 3- Arrange serial imaging
- 4- No further investigation/treatment required
- 5- Treat with Cabergoline

Answer & Comments

Answer: 3- Arrange serial imaging

This man has a co-incidentally detected pituitary macroadenoma. The small elevation in prolactin probably reflects stalk compression and does not indicate that this is a prolactinoma. In macroprolactinomas, the prolactin concentration is greater than 2000 $\mu\text{U/L}$. In this man's case, with no visual field defects and the tumour being distant from the chiasm, the most appropriate treatment would be observation with serial scanning to assess for any change in size that would then merit surgical intervention. However, this man who is eupituitary may never encounter any growth in this co-incidentally detected non-functional pituitary tumour.



[Q: 537] OnExamination - Endocrinology

A 30-year-old female who is 24 weeks pregnant presents with a blood pressure on

three separate occasions of approximately 160/110 mmHg. Her liver function tests show:

Aspartate transaminase 150 U/L (5-45)

Alkaline Phosphatase 213 U/L (50-120)

Bilirubin 31 $\mu\text{mol/L}$ (0-18)

Which antihypertensive is indicated?

- 1- Atenolol
- 2- Irbesartan
- 3- Labetalol
- 4- Methyldopa
- 5- Ramipril

Answer & Comments

Answer: 3- Labetalol

ACEIs are contraindicated in pregnancy, as they cause renal dysgenesis in the foetus. For this reason A2RBs are also not recommended for use in pregnancy. There is a theoretical risk of IUGR with the use of atenolol in pregnancy, although the studies which showed this effect were done with very large doses of atenolol. One would not utilise Methyldopa in a patient with abnormal LFTs.



[Q: 538] OnExamination - Endocrinology

A 73-year-old woman presented with thirst and polyuria of six months duration. She had suffered several episodes of lower back pain. She was on no medication. On examination she looked well, had a dorsal kyphosis and a blood pressure of 170/95 mmHg.

Investigations revealed:

erythrocyte sedimentation rate 15 mm/1st hour (0-30)

serum urea 11.9 mmol/L (2.5-7.5)

serum creatinine 175 $\mu\text{mol/L}$ (60-110)

serum albumin 40 g/L (37-49)

serum total calcium 2.98 mmol/L (2.2-2.6)

What is the most likely cause of this lady's hypercalcaemia?

- 1- Metastatic breast cancer
- 2- Myeloma
- 3- Osteoporosis
- 4- Primary hyperparathyroidism
- 5- Sarcoidosis

Answer & Comments

Answer: 4- Primary hyperparathyroidism

The prevalence of hyperparathyroidism is said to be 4 per 1000 in women over 60, and is 2-3 times more common in women than men. The lower back pain may be loin pain due to renal colic caused by renal calculi or due to osteoporosis. The renal impairment may be associated with renal calculi, perhaps due to calculi-induced hydronephrosis in extreme cases. Renal impairment in hyperparathyroidism is not uncommon. Chronic hypercalcaemia can compromise the renal concentrating ability, leading to polydipsia and polyuria.

The kyphosis may be due to osteoporosis, which is commonly seen in conjunction with hyperparathyroidism. Classically, hypertension has been associated with hyperparathyroidism. Associated with myeloma one would expect a drop in albumin concentration together with a markedly elevated ESR.



[Q: 539] OnExamination - Endocrinology

Which of the following is a cause of the syndrome of inappropriate ADH secretion:

- 1- Bumetanide
- 2- Fluoxetine
- 3- Dexamethasone
- 4- Carbenoxolone
- 5- Lithium

Answer & Comments

Answer: 2- Fluoxetine

SSRIs are a recognised cause of SIADH. Bumetanide would cause excess renal Na losses. Carbenoxolone would cause apparent mineralocorticoid excess with hypokalaemia and salt retention as would dexamethasone. Lithium causes diabetes insipidus.



[Q: 540] OnExamination - Endocrinology

The peroxisome proliferator activated receptor gamma (PPAR gamma)

- 1- Is a G-protein coupled receptor
- 2- Is activated by free fatty acid as the endogenous ligand
- 3- Is antagonised by thiazolidinediones
- 4- Is a member of the Cytokine receptor superfamily
- 5- Is antagonised by Low density Lipoprotein (LDL).

Answer & Comments

Answer: 2- Is activated by free fatty acid as the endogenous ligand

PPAR gamma is an intra-cellular receptor that is activated by free fatty acids (which are the natural endogenous ligands) and the Thiazolidinediones such as Rosiglitazone and Pioglitazone. On ligand binding it associates with the Retinoid X receptor and couples with DNA producing downstream gene activation with protein synthesis that controls adipocyte differentiation and function, and is also related to cellular anti-inflammatory effects.



[Q: 541] OnExamination - Endocrinology

A 19-year-old female is concerned following exposure to meningococcal meningitis. Her flatmate contracted meningococcal meningitis and she now wants preventative treatment.

She is generally well without any past medical history. She takes Logynon as a contraceptive agent and uses a salbutamol inhaler infrequently.

Which prophylactic anti-microbial treatment would you select?

- 1- Clarithromycin
- 2- Ciprofloxacin
- 3- Augmentin
- 4- Doxycycline
- 5- Rifampicin

Answer & Comments

Answer: 2- Ciprofloxacin

Rifampicin is a reasonable choice as prophylaxis against meningococcal infection but in this 19-year-old sexually active student may be expected to reduce the efficacy of the oral contraceptive through liver enzyme induction. Therefore Ciproxin would be the most appropriate agent from the above list as it does not induce Cytochrome p450.



[Q: 542] OnExamination - Endocrinology

A 60-year-old patient with metastatic breast carcinoma for attends the clinic. She complains of pain in the jaw and ulceration within the oral cavity, which has persisted for 4 weeks following a dental extraction. She has had a course of antibiotic therapy for suspected secondary infection of the ulceration. On examination there is ulceration within the oral cavity, which extends as far as the underlying mandible.

Which of the following drugs is likely to be responsible for her presentation?

- 1- Anastrozole
- 2- Diclofenac.
- 3- Prednisolone
- 4- Tamoxifen

5- Zoledronic acid

Answer & Comments

Answer: 5- Zoledronic acid

The likely causative agent is the nitrogen containing bisphosphonate Zoledronic acid. The clinical scenario suggests a diagnosis of Bisphosphonate associated osteonecrosis of the jaw. This is a recently recognised adverse effect of bisphosphonate therapy. This is a consequence of potent antiresorptive action of the nitrogen containing bisphosphonates. Most cases have been associated with Zoledronic acid and Pamidronate given Intravenously for metastatic bone disease. The reported incidence in patients with malignancy treated with these drugs is between 1.3-4.0%. Dental disease is a recognised predisposing factor. The lesions usually heal with minimal surgical debridement, chlorhexidine mouthwashes, antibiotics and analgesia.



[Q: 543] OnExamination - Endocrinology

Which of the following is a feature of pseudohypoparathyroidism?

- 1- Increased urinary phosphate and cAMP with PTH infusion
- 2- Low serum PTH
- 3- Low serum calcium and low serum phosphate
- 4- Low serum calcium and high serum phosphate
- 5- Shortened 2nd and 3rd metacarpals

Answer & Comments

Answer: 4- Low serum calcium and high serum phosphate

The biochemistry shows a hypocalcaemia with hyperphosphataemia being usual but elevated PTH due to resistance to parathormone (PTH).

This is due to mutation of the PTH receptor with abnormality of the G α subunit with reduced cAMP production following a PTH infusion. There are associated phenotypic signs including short stature, low IQ and shortened 4th and 5th metacarpals.



[Q: 544] OnExamination - Endocrinology

A 22-year-old woman presented with a 5-year history of hirsutism with her having noticed coarse dark hair under her chins. Being a teacher in a primary school, these symptoms are very distressing for her. She has tried local measures such as shaving and applying depilatory creams but without lasting success. Her periods are irregular with oligomenorrhea. She attained menarche at the age of 14-years. She has not yet conceived and has had a coil fitted for contraception. She takes 5mg diazepam at night. On examination, she had a BMI of 24. She had coarse, dark hair over her chin, lower back and inner thighs. She does not have galactorrhea to expression and there were no other clinical features to suggest cushings.

Investigations during the follicular phase:

serum androstenedione 10.1 nmol/L (0.6-8.8)

serum dehydroepiandrosterone sulphate 11.6 μ mol/L (3-12)

serum 17-hydroxyprogesterone 18.6 nmol/L (1-10)

serum oestradiol 380 pmol/L (200-400)

serum testosterone 2.6 nmol/L (0.5-3)

plasma luteinising hormone 3.3 U/L (2.5-10)

plasma follicle-stimulating hormone 3.6 U/L (2.5-10)

What is the next most appropriate investigation?

- 1- 24 hour urinary free cortisol
- 2- CT scan of adrenals
- 3- GnRH test

- 4- short synacthen test with 17 hydroxy progesterone
- 5- ultrasound scan of ovaries

Answer & Comments

Answer: 4- short synacthen test with 17 hydroxy progesterone

In this case the patient has features that would suggest PCOS yet the 17OHP concentration is elevated and is compatible with non classical CAH yet just below the threshold off 33 to confidently make the diagnosis. Thus a short synacthen test would be the most appropriate investigation with measurement of 17OHP. A rise in 17OHP above 33 nmol/l suggests non-classical CAH.



[Q: 545] OnExamination - Endocrinology

Which of the following hormones acts through cyclic AMP as the second messenger?

- 1- insulin
- 2- Oestradiol
- 3- PTH
- 4- TRH
- 5- tri-iodothyronine

Answer & Comments

Answer: 3- PTH

Unlike steroids (progesterone, testosterone, oestradiol and cortisol) other ionic hormones such as Adrenaline, GHRH, glucagon, LH, FSH, PTH, and TSH are unable to pass the plasma membrane acting upon cell surface receptors and then through cAMP as the second messenger. Insulin acts through MAP kinase pathway, as does GH and Prolactin. TRH, GnRH and ADH act through calcium/Phosphoinositide. Nitric oxide and ANP act through cGMP. T3 acts by binding to intracellular receptors.



[Q: 546] OnExamination -
Endocrinology

A 42-year-old male presents with tiredness and central weight gain, two years after having undergone pituitary surgery for a non-functional pituitary tumour. He has otherwise recovered from his pituitary surgery well, has been found to have complete anterior hypopituitarism and is receiving stable replacement therapy with testosterone monthly injections, thyroxine and hydrocortisone.

On examination there are no specific abnormalities, his vision is 6/9 in both eyes and he has no visual field defects. From his notes you see that he has gained 8kg in weight over the last six months and his BMI is 31 kg/m². His blood pressure is 122/72 mmHg. Thyroid function tests and testosterone concentrations have been normal. A post-operative MRI scan report shows that the pituitary tumour has been adequately cleared with no residual tissue.

Which of the following is the likely cause of his current symptoms?

- 1- Aldosterone deficiency
- 2- Depression
- 3- DDAVP deficiency
- 4- Growth hormone deficiency
- 5- Somatisation disorder

Answer & Comments

Answer: 4- Growth hormone deficiency

This young patient presents with deteriorating tiredness and weight gain after having had pituitary surgery for a non-functioning pituitary tumour. He has associated anterior hypopituitarism but is receiving appropriate and stable replacement therapy. However, these symptoms are typical of an untreated adult growth hormone deficiency and reductions in quality of life, reduced energy and detrimental changes in body composition

are well recognised. Recent evidence would suggest that GH replacement therapy in addition to his current replacement therapy does improve symptoms and quality of life and is endorsed by NICE guidance.

The renin-aldosterone system is independent of the hypothalamo-pituitary axis and therefore aldosterone is not necessary. The patient does not have any symptoms of thirst or polyuria and therefore vasopressin deficiency is also an unlikely cause of his problems. Whilst depression or somatisation are possibilities it is important to recognise that the symptoms of tiredness and the weight gain is more in keeping with GH deficiency and no other features of either of the former diagnoses are suggested.



[Q: 547] OnExamination -
Endocrinology

Which of the following is true of IGF-1 concentrations

- 1- Concentrations are reduced in pregnancy
- 2- Concentrations are elevated in hepatic cirrhosis
- 3- Concentrations are usually elevated in adult growth hormone deficiency
- 4- Concentrations are reduced in starvation
- 5- Concentrations are elevated in diabetes mellitus

Answer & Comments

Answer: 4- Concentrations are reduced in starvation

IGF-1 concentrations are often increased in pregnancy. Reduced IGF-1 is typically found in adult GHD, Cirrhosis of the liver due to reduced synthesis, diabetes mellitus and starvation.



[Q: 548] OnExamination -
Endocrinology

A 50-year-old man presents with a diagnosis of acromegaly but has normal visual fields.

Which of the following is the most appropriate treatment for this patient?

- 1- Bromocriptine
- 2- Cabergoline
- 3- Radiotherapy
- 4- Somatostatin analogue therapy
- 5- Trans-sphenoidal hypophysectomy

Answer & Comments

Answer: 5- Trans-sphenoidal hypophysectomy

The most appropriate treatment for acromegaly in this middle-aged man which may prove curative is surgery. Somatostatin therapy, although frequently effective in reducing GH, would not be advocated in this young patient who would require lifelong therapy.



[Q: 549] OnExamination -
Endocrinology

A 39-year-old female presents with polyuria and is passing 4 litres of urine per day. She was recently started on a new medication

Serum sodium 128 mmol/l

Plasma osmolality 272 mosmol/l (275-290)

Urine osmolality 380 mosmol/l (350-1000)

Which of the following drugs was prescribed?

- 1- Aspirin
- 2- Fluoxetine
- 3- Furosemide
- 4- Lithium
- 5- Metoprolol

Answer & Comments

Answer: 2- Fluoxetine

This lady has hyponatraemia, hypotonicity (low serum osmolality) and inappropriately concentrated urine which is consistent with Syndrome of Inappropriate ADH. Of the drugs listed fluoxetine is the most likely cause of SIADH.



[Q: 550] OnExamination -
Endocrinology

With which of the following is hyperprolactinaemia associated?

- 1- Cabergoline therapy
- 2- Depression
- 3- Fluoxetine therapy
- 4- Hyperthyroidism
- 5- Sheehan's syndrome

Answer & Comments

Answer: 3- Fluoxetine therapy

Hyperprolactinaemia may be manifest by a milky discharge from the breasts. Causes include, prolactinoma, hypothyroidism (far increased TRH), Non-functional tumour with stalk compression and drugs in particular dopamine antagonists such as chlorpromazine, haloperidol and domperidone. Pregnancy is a particularly common cause of hyperprolactinaemia. Other drugs that are occasionally reported include SSRIs. PCOs is often associated with idiopathic hyperprolactinaemia.



[Q: 551] OnExamination -
Endocrinology

A 19-year-old male presents with concerns regarding his pubertal development. On examination he is 1.8 m tall, thin and has little pubic and axillary hair. Both testes are approximately 5 mls in volume (Normal 15mls). No other abnormalities are encountered. Investigations reveal: LH 3.3 mu/l (3-10) FSH 5.5 mu/l (3-10) Testosterone 5.5 nmol/l (9-30)

Which of the following is the most likely diagnosis?

- 1- Anorexia nervosa
- 2- Craniopharyngioma
- 3- Kallmann syndrome
- 4- Klinefelter's syndrome
- 5- Primary testicular failure

Answer & Comments

Answer: 3- Kallmann syndrome

This young male has delayed puberty with hypogonadotrophic hypogonadism. The most likely explanation would be Kallmann syndrome. Klinefelter's would be associated with elevated LH/FSH as would primary testicular failure. His height of 1.8m suggesting that he is tall would argue against this being anorexia despite his 'thin' appearance as if anorexia had preceded puberty then his stature should also have been affected. The only other possibility is Craniopharyngioma but this is probably less likely in an otherwise well man and other possible features should be included to suggest this diagnosis - visual fields maybe. You may wish to cry foul at this point and say that anosmia should be given as a clue to Kallmann's. However, in theory how often do you ask about sense of smell let alone test for it!



[Q: 552] OnExamination - Endocrinology

Which of the following statements regarding bariatric surgery is correct?

- 1- Bariatric surgery is contraindicated in adolescents
- 2- Is indicated in patients with a BMI <35 kg/m²
- 3- Is associated with a significant post-operative mortality
- 4- Is associated with nutritional deficiencies

- 5- Reduces cardiovascular mortality

Answer & Comments

Answer: 4- Is associated with nutritional deficiencies

Bariatric surgery is a major gastrointestinal procedure. Bariatric surgery in adolescents raises social, psychological and developmental issues, but adolescents are not excluded from surgery, and some hospitals have specialised programmes for younger patients. Potential candidates for surgery are those with a body mass index (BMI) exceeding 40, or BMI > 35 with serious co-morbidities (eg sleep apnoea, type 2 diabetes). Post-operative mortality ranges from 0.1 to 2%.

Vomiting is a risk associated with bariatric surgery, as is dumping syndrome and nutritional deficiencies. There is no evidence as yet, that bariatric surgery reduces cardiovascular mortality in patients.



[Q: 553] OnExamination - Endocrinology

An 18-year-old woman presented with a history of 15 kg weight loss in the previous four months. She has been amenorrhoeic for some months. On examination she had fine lanugo hair and a blood pressure of 110/60 mmHg.

Which one of the following laboratory results would support the most likely clinical diagnosis?

- 1- High plasma follicle stimulating hormone concentration
- 2- Low plasma testosterone concentration
- 3- High serum ferritin concentration
- 4- Normal plasma cortisol concentration
- 5- Suppressed thyroid stimulating hormone concentration

Answer & Comments

Answer: 4- Normal plasma cortisol concentration

The question alludes to a patient with Anorexia nervosa. Anorexia is associated with functional hypogonadotrophic hypogonadism with low FSH and LH levels. Cortisol levels may be increased but are typically within the 'normal range'. They may however, may fail to suppress with dexamethasone. Plasma testosterone levels are normal in females with anorexia. Basal levels of TSH, as well as T4 and T3 are normal. Ferritin levels are low in a state of malnutrition.



[Q: 554] OnExamination - Endocrinology

A 16-year-old girl is diagnosed with Turner's syndrome.

Which of the following autoimmune conditions is most commonly associated with Turner's?

- 1- Addison's disease
- 2- Autoimmune hepatitis
- 3- Hashimoto's thyroiditis
- 4- Sjogren's syndrome
- 5- Vitamin B₁₂ deficiency

Answer & Comments

Answer: 3- Hashimoto's thyroiditis

Hypothyroidism is quite common occurring in up to 24% of patients with Turner's syndrome. It is typically autoimmune in origin - Hashimoto's thyroiditis though the exact explanation for its high prevalence is not known.



[Q: 555] OnExamination - Endocrinology

A 48-year-old lady has obesity with a BMI of 37 kg/m² and her waist measurement is 115 cm (very high). She gained most of the weight

about 10 years ago and since that time she has tried many different forms of diet and weight-loss clubs. Although she enjoys swimming she is finding it harder to keep up her exercise and walking is restricted to a few hundred metres because of foot pain.

On further questioning her diet is quite reasonable consisting of about 1800 KCal per day. She eats breakfast, bases her meals on starchy foods, eats plenty of fibre and at least five portions of vegetables or fruit per day.

Which of the following management strategies according to NICE guidance on obesity (published December 2006) would be advisable for this lady?

- 1- Diet and physical activity, consider drugs
- 2- Extended period, very low calorie diet
- 3- General advice on healthy weight and lifestyle
- 4- Referral for bariatric surgery
- 5- Referral to specialist obesity service

Answer & Comments

Answer: 1- Diet and physical activity, consider drugs

NICE recommendations are to first classify the level of this lady's obesity. This can easily be achieved by looking at the tables in the NICE quick-reference guide on obesity.

Classification BMI kg/m²

Healthy weight 18.5 - 24.9

Overweight 25 - 29.9

Obesity I 30 - 34.9

Obesity II 35 - 39.9

Obesity III 40 or more

Her waist circumference is very high (> 88 cm) and, in the absence of co-morbidities, we can see that the initial management should be diet and exercise with consideration of drug treatment which should be discussed.

Extended period (longer than 12 weeks) low-calorie diet and bariatric surgery may be considered but would warrant specialist referral.



[Q: 556] OnExamination - Endocrinology

A 17-year-old female attends clinic complaining of hirsutism and oligomenorrhoea.

Which of the following would be most suggestive of a diagnosis of Polycystic Ovarian Syndrome?

- 1- Increased androstenedione concentration
- 2- Increased insulin concentration
- 3- Increased Prolactin concentration
- 4- Increased FSH concentration
- 5- Increased Sex Hormone binding globulin (SHBG) concentration

Answer & Comments

Answer: 1- Increased androstenedione concentration

PCOs is associated with a raised LH:FSH ratio, with insulin resistance and hyperandrogenism as evidenced by raised androstenedione and slightly raised testosterone. Elevated prolactin concentrations although a feature of PCOs is not specific of the diagnosis and may suggest microprolactinoma. Although insulin resistance is a feature of PCOs, a raised insulin concentration is rather irrelevant and no one would measure this in clinical practice. It is often elevated in association with testosterone secreting tumours.



[Q: 557] OnExamination - Endocrinology

Which of the following cell types are linked with the substance they synthesize ?

- 1- Gastric chief cells - Intrinsic factor
- 2- Islet A cells - somatostatin

- 3- Islet B cells - amylin
- 4- Islet D cells - pancreatic polypeptide
- 5- Islet F cells - glucagon

Answer & Comments

Answer: 3- Islet B cells - amylin

Islet beta cells produce insulin and Amylin, as well as C-peptide, pro-insulin and GABA. Islet D cells produce somatostatin, F cells produce pancreatic polypeptide and A cells produce glucagon. Gastric chief cells produce pepsinogen whilst gastric parietal cells produce acid and intrinsic factor.



[Q: 558] OnExamination - Endocrinology

A 52-year-old female presents with tiredness. There are no specific abnormalities noted on examination, but investigations reveal a T4 of 21.1 (NR 9.8 - 23), a T3 of 5.2 pmol/l (NR 3.3 - 5.5) and a TSH of 0.05 mU/l (NR 0.1 - 5 mU/l). Thyroid autoantibody titres are all undetectable.

These results suggest a diagnosis of

- 1- DeQuervain's thyroiditis
- 2- Sick euthyroid syndrome
- 3- Solitary toxic nodule
- 4- Graves' disease
- 5- Hashimoto's thyroiditis

Answer & Comments

Answer: 3- Solitary toxic nodule

This patient has subclinical hyperthyroidism and, in the absence of thyroid auto-antibodies, the most probable explanation of these thyroid function abnormalities is a solitary toxic nodule.



[Q: 559] OnExamination -
Endocrinology

Which of the following suggests a diagnosis of familial combined hyperlipidaemia (FCHL) rather than heterozygous familial hypercholesterolaemia (FH)?

- 1- Tendon xanthomas
- 2- Presence of glucose intolerance
- 3- Strong family history of premature coronary artery disease
- 4- Presence of arcus senilis
- 5- Absence of hyperuricaemia

Answer & Comments

Answer: 2- Presence of glucose intolerance

The genetic dyslipidaemias occur in one third of patients who have suffered from their first myocardial infarction below the age of 50 years in men. The commonest is familial combined hyperlipidaemia (two thirds), with a fifth due to familial hypercholesterolaemia. The former can be diagnosed only on family studies, and there is elevation of fasting plasma triglycerides not associated with hypercylomicronaemia. It is autosomal dominant, and some family members may have hypercylomicronaemia. Only 20% of children have elevated triglycerides before the age of 25. Obesity, insulin resistance, hyperinsulinaemia, glucose intolerance, and hyperuricaemia are associated. Heterozygous familial hypercholesterolaemia is dominantly inherited, and results from defects in the LDL receptor. The most important clinical manifestation is premature coronary artery disease, particularly with onset between the third or fourth decade. Tendon xanthomata and arcus cornea are rarely present in children, but are very important signs to identify.



[Q: 560] OnExamination -
Endocrinology

An 80 year-old male presents with a brief history of weakness and giddiness, following an episode of diarrhoea. He has been taking bendroflumethiazide for the last 3 years. On examination, his pulse is 100 beats per minute with a blood pressure of 130/80 mmHg (lying) and 100/70 mmHg (standing). Investigations reveal:

Sodium 120 mmol/L

Potassium 5.5 mmol/L

Urea 13 mmol/L

Creatinine 130 umol/L

random plasma glucose 13 mmol/L

What is the most likely cause of the hyponatraemia?

- 1- Bendroflumethiazide
- 2- Diarrhoea
- 3- Hyperglycaemia
- 4- Inappropriate secretion of antidiuretic hormone
- 5- Renal tubular acidosis

Answer & Comments

Answer: 5- Renal tubular acidosis

The patient is diabetic as reflected by the elevated random glucose, has hyponatraemia, renal impairment and mild hyperkalaemia which appears to have been precipitated following diarrhoea. Hypoadrenalism is unlikely as he has hyperglycaemia and the hyperglycaemia would itself be expected to cause a dehydration and hence hypernatraemia. This sort of picture in an elderly male diabetic is typical of hyporeninaemic hypoaldosteronism - type IV RTA and could be exacerbated both by the diarrhoea and by the diuretic. It is unlikely that the diarrhoea alone has caused the hyponatraemia.



[Q: 561] OnExamination -
Endocrinology

A type 2 diabetic patient being treated with gliclazide, presents with sweating and dizziness. He is on treatment for hypertension, atrial fibrillation, joint pain and indigestion. Blood glucose was 1.9 mmol/L.

Which of the following drugs is responsible?

- 1- Aspirin
- 2- Atenolol
- 3- Digoxin
- 4- Fluconazole
- 5- Ranitidine

Answer & Comments

Answer: 1- Aspirin

Gliclazide is highly bound to plasma proteins, about 94%. Its free plasma level increases on displacement by aspirin given for joint pains. As a result of drug interaction, hypoglycemia may be potentiated when a sulfonylurea is used concurrently with agents such as: long-acting sulfonamides, tuberculostatics, phenylbutazone, clofibrate, MAO inhibitors, coumarin derivatives, salicylates, probenecid, propranolol, cimetidine, disopyramide and angiotensin converting enzyme inhibitors. Plasma protein binding of fluconazole is low and it's excreted by kidney.



[Q: 562] OnExamination -
Endocrinology

A 40-year-old man was found to have acromegaly.

What is the most likely cause of death if treatment is unsuccessful?

- 1- Colorectal carcinoma
- 2- Diabetic nephropathy
- 3- Gastric carcinoma
- 4- Left ventricular failure
- 5- Increased intracranial pressure

Answer & Comments

Answer: 4- Left ventricular failure

If treatment of acromegaly is unsuccessful, the death rate from cardiovascular, cerebrovascular, respiratory and malignant disease is 2-4 times that of the general population. Classically the malignancy associated with acromegaly is tumour of the large intestine. Mortality is typically due to a cardiovascular cause if the condition is untreated. Thus heart failure is probably more common a cause of death than colonic neoplasia.



[Q: 563] OnExamination -
Endocrinology

Which one of the following is a feature of the VIPoma syndrome?

- 1- Alkalosis
- 2- Hypoglycaemia
- 3- Hypokalaemia
- 4- Increased gastric acid secretion
- 5- Provocation of VIP release by somatostatin

Answer & Comments

Answer: 3- Hypokalaemia

a, b,d,e: All opposite to what is expected. VIPOMA -Features vasoactive intestinal polypeptide secreting tumour, mainly pancreas rarely ganglioneuroblastoma (sympathetic chain or adrenal cortex), secretory diarrhoea ('pancreatic cholera'), weight loss, dehydration, abdominal colic, cutaneous flushing, raised plasma VIP, urea+Calcium, raised plasma pancreatic polypeptide, hypokalaemic acidosis (loss of alkaline secretions), achlorhydria, mildly raised glucose, normal functions of VIP. -increased intestinal secretion water and electrolytes - peripheral vasodilation -inhibits gastric acid secretion -potentiates acetylcholine action on salivary glands



[Q: 564] OnExamination -
Endocrinology

A 39-year-old male presents with gynaecomastia.

Which of the following is the most likely cause of his gynaecomastia?

- 1- Congenital adrenal hyperplasia
- 2- Prolactinoma
- 3- Hypopituitarism
- 4- Hypothyroidism
- 5- Seminoma

Answer & Comments

Answer: 5- Seminoma

Gynaecomastia is due to a perturbation in the testosterone to oestradiol ratio. Neither hyperprolactinaemia nor hypopituitarism disturb this ratio and are rarely associated with gynaecomastia. Unlike hyperthyroidism, hypothyroidism is not a cause. CAH is not a cause. However, gynaecomastia may be a presenting symptom of a seminoma and may arise due to HCG secretion.



[Q: 565] OnExamination -
Endocrinology

A 32-year-old woman presented with a six week history of 7kg weight loss and heat intolerance. Investigations revealed:

Free T₄ 45 pmol/L (10-22)

TSH <0.05 mU/L (0.5-5)

Which of the following features would support a diagnosis of Graves' disease?

- 1- Family history of Radio-iodine treatment
- 2- Lid lag
- 3- Multinodular goitre
- 4- Pretibial myxoedema
- 5- Unilateral exophthalmos

Answer & Comments

Answer: 4- Pretibial myxoedema

A tough question. The specific features that would support a diagnosis of Graves would include exophthalmos, thyroid bruit and pretibial myxoedema. The latter is pathognomonic, as exophthalmos may be a feature (rarely) of hashitoxicosis.



[Q: 566] OnExamination -
Endocrinology

Oral therapy with which of the following may cause galactorrhoea?

- 1- Bromocriptine
- 2- Cabergoline
- 3- Spironolactone
- 4- Cimetidine
- 5- Domperidone

Answer & Comments

Answer: 5- Domperidone

Domperidone is a dopamine antagonist producing large rises in prolactin concentrations. Spironolactone has no effect on prolactin and Cimetidine produces hyperprolactinaemia only when given IV. Both bromocriptine and cabergoline are dopamine agonists and reduce prolactin.



[Q: 567] OnExamination -
Endocrinology

A 36-year-old male presents with lethargy. He takes no medication and has generally been otherwise well. Examination reveals that he is obese with a BMI of 36.4 kg/m² and a blood pressure of 120/72. There are no abnormalities of the cardiovascular, respiratory or abdominal systems. Investigations reveal a sodium of 141 mmol/l, a potassium of 2.8 mmol/l, a urea of 5.6 mmol/l and a creatinine of 76 mmol/l.

What is the most likely diagnosis.

- 1- Conn's syndrome
- 2- Apparent mineralocorticoid excess
- 3- Cushing's syndrome
- 4- Hypokalaemic periodic paralysis
- 5- Bartter's syndrome

Answer & Comments

Answer: 5- Bartter's syndrome

Bartter's syndrome is a mixed bag of disorders but most frequently characterised by an autosomal recessive condition consisting of juxta-glomerular cell hyperplasia and secondary hyperaldosteronism. A normal or low blood pressure is typical. It may present in childhood with weakness and failure to thrive but may present co-incidentally in adulthood.



[Q: 568] OnExamination - Endocrinology

A 33-year-old female presents with tiredness and lethargy. Five years previously she had undergone a frontal surgery for a craniopharyngioma following presentation with amenorrhoea and headache. Post-operatively she developed seizures and was treated with sodium valproate. She was demonstrated to be hypopituitary and receives hydrocortisone, thyroxine, oestrogen replacement therapy and desmopressin.

Which of the following investigations would you select to confirm a growth hormone deficiency.

- 1- IGF-1 concentration
- 2- Insulin tolerance test
- 3- Clonidine test
- 4- L-dopa test
- 5- GHRH/Arginine test

Answer & Comments

Answer: 5- GHRH/Arginine test

This patient is more than likely to be GH deficient which would explain the lethargy but this requires confirmation before initiating treatment. Although an insulin tolerance test is the gold standard for the diagnosis of GHD, it is contra-indicated due to the epilepsy. Therefore GHRH/arginine is regarded as a suitable alternative.



[Q: 569] OnExamination - Endocrinology

A 64-year-old male presents with difficulty in micturition. He is diagnosed with benign prostatic hyperplasia and elects to receive finasteride.

Production of which of the following hormones would be selectively inhibited?

- 1- Testosterone
- 2- Dihydroepiandrosterone sulphate (DHEAS)
- 3- Androstenedione
- 4- Dihydrotestosterone (DHT)
- 5- IGF-1

Answer & Comments

Answer: 4- Dihydrotestosterone (DHT)

Finasteride is a 5 alpha-reductase inhibitor and inhibits the conversion of testosterone to the active DHT.



[Q: 570] OnExamination - Endocrinology

A 37-year-old female presents with galactorrhoea. She has a history of dyspepsia for which she receives omeprazole. Examination reveals a BMI of 23.5 kg/m² and a small amount of galactorrhoea to expression. Investigations show a prolactin concentration of 850 mU/l (NR 50 - 500 mU/l), an oestradiol of 88 pmol/l (NR 130 - 500), a LH of 3.2 mU/l (NR 3.5 - 8) and a FSH of 2.8 mU/l (NR 3 - 8).

What disorder should be considered?

- 1- Addison's disease
- 2- Hyperthyroidism
- 3- MEN type 1
- 4- Drug-induced hyperprolactinaemia
- 5- Hypothyroidism

Answer & Comments

Answer: 3- MEN type 1

The presence of hyperprolactinaemia with hypogonadotrophic hypogonadism suggests a diagnosis of a microprolactinoma and in combination with the recurrent dyspepsia a diagnosis of MEN type 1 should be considered. The galactorrhoea is not due to cimetidine as this does not cause hyperprolactinaemia. Addison's disease does not cause hyperprolactinaemia and both hypothyroidism and hyperthyroidism would not fit this clinical scenario.



[Q: 571] OnExamination - Endocrinology

Which of the following is associated with a GH secreting pituitary tumour

- 1- Gs alpha subunit mutation
- 2- Pit-1 mutation
- 3- H-ras mutation
- 4- Rb 1 mutation
- 5- p53 mutation

Answer & Comments

Answer: 1- Gs alpha subunit mutation

A stimulatory mutation of the Gs protein alpha subunit has been noted in approximately 30% of GH secreting pituitary tumours.



[Q: 572] OnExamination - Endocrinology

Which of the following is not a recognised

association of acromegaly?

- 1- Pseudogout
- 2- Hypertension
- 3- Goitre
- 4- Elevated serum phosphate levels
- 5- Reduced serum prolactin levels

Answer & Comments

Answer: 5- Reduced serum prolactin levels

Pseudogout is seen in acromegaly, but not gout. Hypertension, heart failure and cardiomyopathy may occur. Goitre is seen in 20%, along with other soft tissue swelling. Phosphate levels are elevated but calcium levels are not significantly increased. 30% have elevated prolactin levels, a combination of a damaged pituitary stalk reducing the dopamine suppression signal, and reduced TSH levels leading to increased TRH, which stimulates prolactin secretion



[Q: 573] OnExamination - Endocrinology

Which of the following antibodies are typically found in auto-immune adrenalitis (Addison's disease)

- 1- Anti-rho antibody
- 2- Anti-peroxidase antibody
- 3- Anti-21hydroxylase antibody
- 4- Anti-nuclear antibody
- 5- Anti-tryptophan hydroxylase antibody

Answer & Comments

Answer: 3- Anti-21hydroxylase antibody

21 hydroxylase is the enzyme involved in the cholesterol steroid pathway and has been found to be present in approximately 80% of cases.



[Q: 574] OnExamination -
Endocrinology

In randomised clinical studies, post-menopausal hormone replacement therapy

- 1- Reduces cardiovascular mortality.
- 2- Causes regression of coronary plaques.
- 3- Increases plasma LDL concentrations.
- 4- Increases plasma triglycerides
- 5- Reduces the incidence of stroke

Answer & Comments

Answer: 4- Increases plasma triglycerides

In RCTs, HRT has not been shown to reduce CV mortality or the incidence of stroke (Heart Estrogen Replacement Study - HERS), nor does it cause regression of coronary plaques (Estrogen replacement and angiography study - ERA). In fact, HRT has been shown to have an increased CV morbidity in the WHI study. It does not produce a raised LDL, but may increase HDL concentrations. Similarly it frequently produces a rise in triglyceride concentrations.



[Q: 575] OnExamination -
Endocrinology

A chromophobe adenoma of the pituitary would be expected in which of the following

- 1- Cushing's disease
- 2- Acromegaly
- 3- Non-functioning pituitary tumour
- 4- TSH secreting tumour
- 5- Prolactinoma

Answer & Comments

Answer: 3- Non-functioning pituitary tumour

A chromophobe adenoma refers to no uptake of dye within the tumourous specimen. This occurs in the non-secretory/non-functioning pituitary tumours.



[Q: 576] OnExamination -
Endocrinology

A 35-year-old woman presents with episodic sweats associated with hunger. She was otherwise well, and had gained some weight recently. Investigations reveal normal urea and electrolytes, liver function tests and full blood count. An overnight fasting plasma glucose is 3.8 mmol/l (NR 3-6).

What is the most appropriate investigation for this patient?

- 1- 24 hour ECG recording
- 2- 72 hr fast
- 3- fasting insulin and C-peptide concentrations
- 4- MR scan of pancreas
- 5- Short synacthen test

Answer & Comments

Answer: 2- 72 hr fast

This patient presents with features suggestive of spontaneous hypoglycaemia often due to an insulinoma. She requires confirmation of the suspected diagnosis and this should be undertaken with a 72 hr fast. If the patient develops symptoms then a plasma glucose is measured and if low, insulin and c-peptide is then collected and the fast terminated. We have been provided with a fasting plasma glucose on this patient which is normal. Measuring insulin and c-peptides with this normal glucose would provide no meaningful information. First we have to see whether she actually becomes hypoglycaemic.



[Q: 577] OnExamination -
Endocrinology

A 35-year-old man presents with left loin pain and haematuria. He comments that he has had three episodes of similar symptoms in the past. On examination, he is afebrile and has mild pallor. Investigations show:

Sodium 140 mmol/L (135 -145)

Potassium 3.0 mmol/L (3.5 5)
 Chloride 115 mmol/L (95 105)
 Bicarbonate 12 mmol/L (22 30)
 Calcium 2.5 mmol/L (2.2 2.6)
 Urea 19 mmol/L (2.5 7.5)
 Urinalysis pH 6.5, protein 1+, RBC 1+, White cell count 1+

What is the most likely diagnosis?

- 1- Bartter's syndrome
- 2- Conn's syndrome
- 3- Renal tubular acidosis type 1
- 4- Renal tubular acidosis type 2
- 5- Renal tubular acidosis type 4

Answer & Comments

Answer: 3- Renal tubular acidosis type 1

The patient has metabolic acidosis with failure to appropriately acidify the urine, pointing to a diagnosis of renal tubular acidosis (RTA). Type 1 RTA is due to distal tubule defect to excrete hydrogen ions whereas type 2 RTA is associated with proximal tubule defect to reabsorb bicarbonate. Type 1 is associated with nephrocalcinosis. Both type 1 and 2 are associated with hypokalaemia whereas type 4 is characterized by hyperkalaemia. Bartters and Conns syndromes are causes of hypokalaemia and metabolic alkalosis.



[Q: 578] OnExamination - Endocrinology

A 18 year-old girl presents with anxiety and palpitations. Her mother had been treated for an overactive thyroid gland having received radioiodine and was now on Thyroxine replacement therapy. On examination she had a pulse of 104 bpm with a fine tremor and lid lag. There was no goitre palpable.

Investigations revealed:

serum Free T₄ 33 pmol/L (10-20)

plasma thyroid stimulating hormone (TSH) <0.05 (0.5-4.5)

serum antithyroid peroxidase (anti TPO) titre 40 IU/L (<50)

What is the most likely cause of her symptoms?

- 1- factitious thyrotoxicosis
- 2- familial hyperthyroglobulinaemia
- 3- Hashitoxicosis
- 4- Graves' disease
- 5- Riedel's thyroiditis

Answer & Comments

Answer: 4- Graves' disease

Although the lead-in might make you think that this patient could gain access to thyroxine and so a diagnosis of factitious hyperthyroidism is possible, in practice this is extremely unlikely. A strong family history of thyrotoxicosis is typical for Graves' disease and the absence of a goitre with the absence of TPO antibodies (found in 80% of Graves cases) again is compatible with a diagnosis of Graves.



[Q: 579] OnExamination - Endocrinology

A 52-year-old woman presents with tiredness and weight gain. She is confirmed to have autoimmune thyroiditis.

Which of the following tumours is she at increased risk of developing?

- 1- Anaplastic carcinoma of the thyroid
- 2- Follicular carcinoma of the thyroid
- 3- Medullary carcinoma of the thyroid
- 4- Papillary carcinoma of the thyroid
- 5- Thyroid lymphoma

Answer & Comments

Answer: 5- Thyroid lymphoma

There is a small but recognised risk of developing thyroid lymphoma associated with autoimmune thyroiditis (aka Hashimoto's disease or lymphocytic thyroiditis). The risk is small and would certainly not be screened for, nor should it in patients with autoimmune thyroid disease.



[Q: 580] OnExamination - Endocrinology

A 60 year-old male with diet controlled type 2 diabetes mellitus is commenced on metformin due to deteriorating glycaemic control.

Which of the following is true regarding metformin?

- 1- It often causes hypoglycaemia
- 2- It is safe in patients with renal impairment
- 3- It may cause metabolic alkalosis
- 4- It is contra-indicated in patients suffering a myocardial infarction
- 5- It does not require any functioning pancreatic islet cells for its action

Answer & Comments

Answer: 4- It is contra-indicated in patients suffering a myocardial infarction

Metformin is a biguanide which acts to improve insulin sensitivity through mechanisms that involve hepatic gluconeogenesis and improved muscle glucose utilization. Thus, some insulin must be produced for it to have an effect. It is associated with hypoglycaemia although this side effect is unusual. It is contra-indicated in subjects with renal failure, hepatic failure and heart failure due to the association with lactic acidosis. The BNF states that there should be a 6 week "cooling off" period post-MI before the commencement or recommencement of metformin.



[Q: 581] OnExamination - Endocrinology

A 22-year-old woman presented with hirsutism and oligomenorrhea for the last 5-years. She is an accountancy trainee and does not want to conceive at least for the next couple of years. She is very anxious about her irregular menses and is especially worried as her mother was diagnosed with uterine cancer recently. Examination is essentially normal apart from coarse dark hair being noticed under her chins and over her lower back.

Investigations during the follicular phase:

serum androstenedione 10.1 nmol/L (0.6-8.8)
 serum dehydroepiandrosterone sulphate 11.6 μmol/L (3-12)
 serum 17-hydroxyprogesterone 5.6 nmol/L (1-10)
 serum oestradiol 220 pmol/L (200-400)
 serum testosterone 3.6 nmol/L (0.5-3)
 serum sex hormone binding protein 32 nmol/L (40-137)
 plasma luteinising hormone 3.3 U/L (2.5-10)
 plasma follicle-stimulating hormone 3.6 U/L (2.5-10)

What is the most appropriate treatment?

- 1- combined OCP
- 2- finasteride
- 3- metformin
- 4- progesterone only pill
- 5- spironolactone

Answer & Comments

Answer: 1- combined OCP

This young woman has typical features of PCOS with supportive biochemistry - elevated androstenedione, normal oestradiol and 17OHP. She wants treatment of her hirsutism, does not want to fall pregnant and the most

appropriate therapy would be the combined OCP such as Dianette.



[Q: 582] OnExamination - Endocrinology

A 40-year-old female who has been prescribed thyroid replacement therapy has routine thyroid function tests. On examination she appeared clinically euthyroid with no abnormal findings. Her TFTs revealed:

TSH 3.2 mU/L (0.35 - 5.0)

Total T₄ 20 nmol/L (55 - 144)

Free T₄ 2.6 pmol/L (9 - 24)

Total T₃ 2.5 nmol/L (0.9 - 2.8)

Which one of the following statements is correct?

- 1- Her thyroid hormone replacement is adequate
- 2- Investigation of pituitary function is required
- 3- She has tertiary hypothyroidism
- 4- She has a thyroiditis
- 5- She has sick euthyroid syndrome

Answer & Comments

Answer: 1- Her thyroid hormone replacement is adequate

This question is extremely poorly presented as no one, except for the RCP, measures total thyroid hormone concentrations. However, this patient has normal TSH, low total T₄ with normal total T₃ and really low free T₄ which would suggest that she is taking T₃ as replacement therapy. This may explain why no fT₃ figures are provided. Consequently she is receiving adequate replacement as reflected by the normal TSH. She does not have sick euthyroidism as it states in the run in that these measurements were routine. Although TSH is normal and tT₄ and fT₄ low, secondary/tertiary hypothyroidism would not explain the plum normal total T₃

concentration. She may well have had a thyroiditis such as Hashimoto's to have given her the hypothyroidism originally but she is now on replacement therapy and the former would not explain her TFTs.



[Q: 583] OnExamination - Endocrinology

A 44-year-old female presents with features suggestive of Cushing's syndrome. Initial investigations reveal a 24 hr Urine free cortisol concentration of 350 nmol/day (NR <250).

Which is the most appropriate investigation of this patient's suspected Cushing's syndrome?

- 1- ACTH concentration
- 2- 9am and Midnight cortisol
- 3- High dose dexamethasone suppression test
- 4- Low dose dexamethasone suppression test
- 5- Short synacthen test

Answer & Comments

Answer: 4- Low dose dexamethasone suppression test

This patient is clinically suspected to have Cushing's syndrome with the diagnosis being supported by elevated urine free cortisol concentrations. However, the diagnosis of hypercortisolism needs to be established and the best way of doing this is with a low dose dexamethasone suppression test (DXM 0.5 mg qds for 2 days). The high dose test (2 mg qds for 2 days) adds little diagnostic value over and above the low dose test. 9am and Midnight cortisol concentrations would not add much to the suspicion of hypercortisolism which is provided by the urine free cortisol. Short synacthen tests are used to assess for hypoadrenalism. A CRF test is used occasionally to distinguish between ectopic and pituitary dependent Cushing's. ACTH concentrations would also be valuable after the diagnosis is confirmed to assess for ACTH dependency.



[Q: 584] OnExamination -
Endocrinology

Which of the following is associated with Congenital Adrenal Hyperplasia?

- 1- Delayed puberty
- 2- Hypopigmentation
- 3- Hyporeninaemia
- 4- Persistent Wolffian duct
- 5- Premature epiphyseal closure

Answer & Comments

Answer: 5- Premature epiphyseal closure

Premature epiphyseal closure is a classical feature of CAH, and is secondary to high levels of sex steroids. Under, and over treatment of CAH patients puts patients at risk of short stature, over treatment because of the glucocorticoid induced inhibition of the growth axis. CAH is associated with precocious puberty caused by long term exposure to androgens, which activate the hypothalamic-pituitary-gonadal axis.

Similarly, CAH is associated with hyperpigmentation, and hyperreninaemia due to sodium loss and hypovolaemia. The Wolffian duct is never formed in CAH.



[Q: 585] OnExamination -
Endocrinology

Which of the following is a characteristic feature of familial hypercholesterolaemia?

- 1- Autosomal dominant inheritance
- 2- elevated chylomicrons
- 3- hypertriglyceridaemia
- 4- increased expression of LDL receptors
- 5- Palmar xanthomas

Answer & Comments

Answer: 1- Autosomal dominant inheritance

Familial hypercholesterolaemia is an autosomal dominant condition manifest by increased LDL concentrations (not chylomicrons) due to constitutional abnormalities and reduced numbers of the LDL receptor. Hypertriglyceridaemia is not characteristic and HDL concentrations are usually decreased. Tendon xanthomata are characteristic and the condition is associated with a premature cardiovascular mortality.



[Q: 586] OnExamination -
Endocrinology

A 35-year-old female is found to have a solitary mass on the chest x-ray. Biopsy confirms this to be a carcinoid tumour of the lung.

Which of the following are likely to be associated with this lesion?

- 1- Cushing's syndrome
- 2- Hyponatraemia
- 3- Pellagra
- 4- Pulmonary hypertension
- 5- Carcinoid syndrome

Answer & Comments

Answer: 1- Cushing's syndrome

Carcinoid tumours of the foregut (such as lung) unlike tumours of the midgut are not associated with carcinoid syndrome but may secrete CRF/ACTH resulting in ectopic Cushing's syndrome. Other associated conditions where foregut carcinoid tumours are found in the pancreas are associated with Zollinger-Ellison syndrome and VIPoma. A bronchial carcinoid tumour has rarely been reported in association with Acromegaly (ectopic GHRH). They may also be found in association with MEN type 1 where pancreatic neuroendocrine tumours predominate.



[Q: 587] OnExamination -
Endocrinology

A 17 year-old girl presents with vomiting and her investigations show:

sodium 120 mmol/L (137 - 144)

potassium 3.0 mmol/L (3.5-4.9)

urea 2.2 mmol/L (2.5 - 7.5)

urine sodium 2 mmol/L

urine osmolality 700 mosmol/kg (350 - 1000)

What is the most likely diagnosis?

- 1- Addison's disease
- 2- bulimia nervosa
- 3- diuretic abuse
- 4- syndrome of inappropriate antidiuretic hormone secretion
- 5- water intoxication

Answer & Comments

Answer: 2- bulimia nervosa

This patient is likely to have Bulimia ?young girl with a likely low body mass contributing to the low urea, vomiting contributing to the hypokalaemia/hyponatraemia. Her urine sodium is appropriately low and due to a relative dehydration she has appropriately concentrated urine. This is not Addison's disease as urine sodium would be high with high urea and likely high potassium. Similarly it is not SIADH due to the low urine sodium. Diuretic abuse would cause high urine sodium. Water intoxication would produce a dilute urine.



[Q: 588] OnExamination -
Endocrinology

A 26-year-old man presented with polydipsia and polyuria for the last 2 years.

Investigations:

serum urea 8.4 mmol/L (2.5-7.5)

serum creatinine 108 µmol/L (60-110)

serum corrected calcium 2.82 mmol/L (2.2-2.6)

serum phosphate 0.73 mmol/L (0.8-1.4)

plasma parathyroid hormone 6.8 pmol/L (0.9-5.4)

Which of the following mechanisms is responsible for the hypophosphatemia observed?

- 1- increased deposition of calcium phosphate crystals in soft tissues
- 2- increased gastrointestinal secretion of phosphates
- 3- increased renal tubular secretion of phosphates
- 4- reduced gastrointestinal absorption of phosphates
- 5- reduced renal tubular reabsorption of phosphates

Answer & Comments

Answer: 5- reduced renal tubular reabsorption of phosphates

This young patient has mild hypercalcaemia, elevated PTH and low phosphate indicating primary hyperparathyroidism. The hypophosphataemia is due to the reduced renal reabsorption of phosphate.



[Q: 589] OnExamination -
Endocrinology

A 32-year-old woman treated with hydrocortisone 10 mg in the morning and 10 mg in the evening for Addison's disease, presents to the clinic with poor compliance. She feels that the hydrocortisone upsets her stomach and wants to switch to enteric coated Prednisolone.

What would be the appropriate corresponding daily dose of prednisolone?

- 1- 4mg daily
- 2- 5mg daily

- 3- 7mg daily
- 4- 10mg daily
- 5- 15mg daily

Answer & Comments

Answer: 2- 5mg daily

The approximate equivalent glucocorticoid action of prednisolone to Hydrocortisone is 4:1. Hence the equivalent dose for 20mg of Hydrocortisone is roughly 5mg per day of prednisolone.



[Q: 590] OnExamination - Endocrinology

A 34-year-old man presents with a six month history of tiredness, weight gain and cold intolerance. On examination he appeared hypothyroid and had a firm goitre. Investigations reveal:

Free T₄ 6 pmol/L (10-22)

TSH 55 mU/L (0.4-5.0)

What is the most likely diagnosis in this patient?

- 1- De Quervain's thyroiditis
- 2- Hashimoto's thyroiditis
- 3- Iodine deficiency
- 4- Penderd's syndrome
- 5- primary atrophic hypothyroidism

Answer & Comments

Answer: 2- Hashimoto's thyroiditis

Irrespective of gender, the most likely diagnosis in this hypothyroid man is Hashimoto's disease. Iodine deficiency is extremely unlikely in the UK and elevated De Quervain's thyroiditis would be associated with acute presentation with a painful goitre, raised temperature and weight loss. TFTs may be transiently abnormal often high but hypothyroidism may ensue. Pendred's

syndrome is hypothyroidism due to dysmorphogenesis, goitre and sensorineural deafness. Atrophic hypothyroidism would not be associated with goitre.



[Q: 591] OnExamination - Endocrinology

A 55 year-old female complaining of vague tiredness is found to have a serum corrected calcium concentration of 2.9 mmol/l. Examination was unremarkable.

Which of the following results confirms the suspected diagnosis of primary hyperparathyroidism?

- 1- High normal 1,25-dihydroxyvitamin D concentration
- 2- High normal 24 hour urinary calcium concentration
- 3- High normal plasma parathyroid hormone concentration
- 4- Low normal plasma phosphate concentration
- 5- Low normal serum 25-hydroxyvitamin D concentration

Answer & Comments

Answer: 3- High normal plasma parathyroid hormone concentration

Bit too easy really. A high or even normal PTH concentration in the presence of hypercalcaemia would support the diagnosis of hyperparathyroidism. A high urinary Calcium concentration may be expected as would a low plasma phosphate but neither confirm the diagnosis. Elevated 1,25 VitD suggests a diagnosis of hypervitaminosis D.



[Q: 592] OnExamination - Endocrinology

In which of the following conditions would it be expected to find an elevated plasma total cortisol concentration?

- 1- congenital adrenal hyperplasia
- 2- patients on long-term benzodiazepine therapy
- 3- patients taking prednisolone
- 4- pregnancy
- 5- primary aldosteronism

Answer & Comments

Answer: 4- pregnancy

Cortisol levels are increased in pregnancy, conditions of physical and emotional stress and drug therapy (oestrogens, oral contraceptives, amphetamines, cortisone, and spironolactone). Treatment with other forms of steroid lead to decreased levels of cortisol.



[Q: 593] OnExamination - Endocrinology

A 45-year-old man presents with headaches and low libido. He is found to be hypopituitary. The CT scan shows a pituitary tumour with suprasellar extension.

Which of the following structures is likely to be compressed?

- 1- Abducens nerve
- 2- Hypothalamus
- 3- Oculomotor nerve
- 4- 3rd Ventricle
- 5- Optic nerve

Answer & Comments

Answer: 5- Optic nerve

Superior extension of the tumour can lead to compression or invasion of the optic apparatus or the hypothalamus. Lateral extension of the tumour with compression or invasion of the cavernous sinus can compromise third, fourth, or sixth cranial nerve functions, manifest as diplopia in 5 to 15% of pituitary tumour patients. The optic

chiasm lies 5-10mm above the diaphragm sellae and anterior to the stalk. Adenomas larger than 1.5cm frequently have suprasellar extension, and an MRI scan will show compression and upward displacement of the optic chiasm.



[Q: 594] OnExamination - Endocrinology

A 26-year-old man presented with polydipsia and polyuria for the last 2 years.

Investigations:

serum urea 8.4 mmol/L (2.5-7.5)

serum creatinine 108 µmol/L (60-110)

serum corrected calcium 2.82 mmol/L (2.2-2.6)

serum phosphate 0.73 mmol/L (0.8-1.4)

plasma parathyroid hormone 6.8 pmol/L (0.9-5.4)

Which of the following is directly responsible for his increased intestinal calcium reabsorption?

- 1- 1,25 dihydroxy vitamin D
- 2- 25 hydroxy vitamin D
- 3- calcitonin
- 4- hypophosphatemia
- 5- parathyroid hormone

Answer & Comments

Answer: 1- 1,25 dihydroxy vitamin D

This patient has hypercalcaemia due to hyperparathyroidism. However, the intestinal absorption of calcium is facilitated by 1,25 dihydroxyVitamin D.



[Q: 595] OnExamination - Endocrinology

Which of the following is true concerning oral hypoglycaemic agents?

- 1- Acarbose promotes insulin secretion in response to meals
- 2- Chlorpropamide induces liver enzymes
- 3- Glibenclamide is excreted unchanged by the kidney
- 4- Gliclazide inhibits gluconeogenesis
- 5- Metformin inhibits hepatic gluconeogenesis

Answer & Comments

Answer: 5- Metformin inhibits hepatic gluconeogenesis

Chlorpropamide like all the other sulphonylureas stimulate pancreatic insulin secretion. They are not liver enzyme inducers but are affected by liver enzyme inducers and inhibitors. They undergo hepatic metabolism then renal excretion. Acarbose is an alpha glucosidase inhibitor which inhibits the splitting of disaccharides into glucose and so inhibits glucose absorption from the gut. Metformin is an insulin sensitiser and although its actions are not fully understood its main role appears to be through inhibition of hepatic gluconeogenesis.



[Q: 596] OnExamination - Endocrinology

A 51-year-old woman presented with nocturia and Pruritis vulvae. Investigations revealed:
urine dipstick analysis glucose 2%

Which one of the following would most reliably confirm a diagnosis of diabetes mellitus?

- 1- Elevated glycated haemoglobin concentration
- 2- Fasting plasma glucose of 6.7 mmol/L (3.0-6.0)
- 3- 50g oral glucose tolerance test
- 4- Random plasma glucose of 8.3 mmol/L
- 5- Two hour post-prandial plasma glucose of 12 mmol/L (<11.1)

Answer & Comments

Answer: 5- Two hour post-prandial plasma glucose of 12 mmol/L (<11.1)

The post-prandial glucose gives an equivalent to the 75g glucose tolerance test, which would be one of the investigations of choice in this patient. None of the other results listed here formally confirm the diagnosis of Type 2 diabetes.



[Q: 597] OnExamination - Endocrinology

Which one of the following statements applies to an infant with undiagnosed congenital hypothyroidism.

- 1- they may be asymptomatic
- 2- haemolytic jaundice occurs
- 3- they may later have early acceleration of bone age and short stature at maturity
- 4- gastrointestinal disturbances, especially diarrhoea may develop
- 5- Tachyarrhythmias may occur.

Answer & Comments

Answer: 1- they may be asymptomatic

Lack of symptoms may be a feature. Prolonged conjugated hyperbilirubinaemia is seen with this condition. Bone age and growth will be delayed. Constipation rather than diarrhoea is observed. Bradycardia may occur, but tachyarrhythmias are not associated.



[Q: 598] OnExamination - Endocrinology

Maturity onset diabetes of the young (MODY) is due to which of the following:

- 1- BRCA1 and BRCA2 (breast cancer) gene products
- 2- HOX (homeobox) gene family
- 3- Leptin mutations

- 4- Stargardt's disease mutations
5- Glucokinase mutations

Answer & Comments

Answer: 5- Glucokinase mutations

MODY is an autosomal dominantly inherited form of diabetes and is due to glucokinase mutations. Other causes of MODY include Hepatocyte Nuclear Factor (HNF) gene mutations.



[Q: 599] OnExamination - Endocrinology

Useful therapy for improving fertility in Polycystic ovarian syndrome include

- 1- Cyproterone acetate
2- Ethinyl oestradiol
3- Metformin
4- Glibenclamide
5- Spironolactone

Answer & Comments

Answer: 3- Metformin

Metformin has been shown to increase the rate of conception in PCOs through improved insulin sensitivity. Ethinylloestradiol and cyproterone acetate combine to form Dianette the oral contraceptive. Spironolactone is used for hirsutism but is teratogenic. Glibenclamide is not used in PCOs.



[Q: 600] OnExamination - Endocrinology

A 56-year-old male presents with a 5 year history of increased sweats and change in shoe size. Examination reveals prognathism and macroglossia, with large hands. Blood pressure is 180/94 mmHg but visual field examination is full to confrontation.

Which of the following tests would be diagnostic?

- 1- Oral glucose tolerance test
2- TRH test
3- Insulin tolerance test
4- Pituitary MRI
5- IGF-1 concentration

Answer & Comments

Answer: 1- Oral glucose tolerance test

The diagnosis of acromegaly is confirmed with a failure of GH suppression during an oral glucose tolerance test. Though a pituitary adenoma may be present it is not diagnostic of acromegaly.



[Q: 601] OnExamination - Endocrinology

A 17-year-old female who is 16 weeks pregnant reports that her elder brother has vitamin D resistant rickets.

What is the most likely mode of inheritance of this condition?

- 1- Autosomal dominant
2- Autosomal dominant with incomplete penetrance
3- Autosomal recessive
4- X-linked dominant
5- X-linked recessive

Answer & Comments

Answer: 4- X-linked dominant

Vitamin D resistant rickets is inherited in an X-linked dominant manner. Therefore an affected female will transmit the disease to 50% of her sons and 50% of her daughters. An affected male will transmit the condition to all of his daughters but none of his sons. In this case as the mother is unaffected, therefore

there is no risk of the condition being passed to her unborn child.



[Q: 602] OnExamination - Endocrinology

Which of the following is a characteristic feature of primary hyperaldosteronism?

- 1- Gross oedema
- 2- Hyponatraemia
- 3- Muscular weakness
- 4- Oliguria
- 5- Vitiligo

Answer & Comments

Answer: 3- Muscular weakness

Primary hyperaldosteronism or conn's syndrome is characterised by hypokalaemic hypertension. Patients can present with tetany (alkalosis) and muscle weakness (hypokalaemia). Oedema, oliguria are more features of secondary hyperaldosteronism (cirrhosis) and vitiligo (suggesting auto-immunity) is not a feature.



[Q: 603] OnExamination - Endocrinology

A 40-year-old female, with no prior history of thyroid disease, presents with a 5 day history of an acutely painful, left-sided goitre. Clinically she appeared euthyroid, and was afebrile.

Investigations revealed the following

haemoglobin 13.0 g/dL

white cell count $7.0 \times 10^9/L$

platelet count 200

What is the most likely diagnosis?

- 1- De Quervain's thyroiditis
- 2- Haemorrhage into a cyst
- 3- Hashimoto's thyroiditis
- 4- Staphylococcal abscess

5- Thyroid carcinoma

Answer & Comments

Answer: 2- Haemorrhage into a cyst

The left side of this patient's goitre becomes acutely swollen with no other signs and FBC is normal which suggests acute haemorrhage into a cyst. Thyroid cancer is usually painless. De Quervain's thyroiditis is a diffusely tender goitre typically with systemic features such as weight loss, pyrexia and a raised ESR.



[Q: 604] OnExamination - Endocrinology

A 42-year-old male with a 15 year history of type 1 diabetes presents with a two month history of deteriorating pain and stiffness of the right shoulder. On examination he has painful limitation of internal rotation and can abduct the right arm to only 90 degrees. Flexion is relatively unimpaired. There is some weakness of movement of that shoulder with slight wasting of shoulder muscles. He has some reduced vibration sensation in both hands.

Which of the following is the most likely diagnosis?

- 1- Adhesive capsulitis
- 2- Brachial plexopathy
- 3- Calcium pyrophosphate arthropathy
- 4- Diabetic arthropathy
- 5- Rheumatoid arthritis

Answer & Comments

Answer: 1- Adhesive capsulitis

This patient has typical features of a frozen shoulder and this is typified by the reduced internal rotation and abduction of the shoulder. Slight wasting due to pain and reduced use of the shoulder muscles is expected. Brachial plexopathy is associated with involvement of the brachial plexus with

associated specific dermatomal loss of sensation (not the peripheral neuropathy associated with diabetes as in this case) as well as specific loss of strength (not often the shoulder) such as wrist drop, ulna nerve palsy etc.



[Q: 605] OnExamination - Endocrinology

A 29-year-old female student nurse presents with a discrete thyroid swelling. An isotope scan reveals it to be a "cold nodule". She has scattered local cervical lymphadenopathy.

What is the likely diagnosis?

- 1- Anaplastic carcinoma
- 2- Graves disease
- 3- Medullary carcinoma
- 4- Papillary carcinoma
- 5- Subacute thyroiditis

Answer & Comments

Answer: 4- Papillary carcinoma

Papillary carcinoma makes up 75% of thyroid tumours, and this patients age (<45) puts her in a low risk group. Usually these tumours present as "cold nodules" on isotope scanning. These cancers may extend by intraglandular spread or local lymph node invasion. They are slow growing, but may become more aggressive, spreading locally or metastasising, especially to the lung. Anaplastic carcinoma is very aggressive and more common in elderly subjects. Subacute thyroiditis presents with moderate thyroid enlargement, fever, malaise and neck pain. The gland is tender, and there may be signs of thyrotoxicosis.



[Q: 606] OnExamination - Endocrinology

A 38-year-old man presented with intermittent severe headaches. He was prescribed Spironolactone 50mg and

Bendroflumethiazide 2.5mg daily for hypertension. On examination his pulse was 112 beats per minute, with regular rhythm, and blood pressure was 190/110 mmHg. Investigations revealed:

serum sodium 132 mmol/L (137-144)

serum potassium 3.4 mmol/L (3.5-4.9)

serum urea 7.0 mmol/L (2.5-7.5)

Which one of the following is the most useful investigation in establishing the diagnosis?

- 1- A 24 hour urinary 5-hydroxyindoleacetic acid concentration
- 2- A 24 hour urinary catecholamine concentration
- 3- A 24 hour urinary free cortisol concentration
- 4- A radionuclide hippuran renogram
- 5- The serum aldosterone: rennin ratio

Answer & Comments

Answer: 2- A 24 hour urinary catecholamine concentration

This question is typical of an MRCP question which may be used as a "good discriminatory question"! It seems nebulous at first, but on further investigation it is extremely complex. One can imagine the smirks of the old gentlemen in the college at the post-exam port soiree.

The answer is unlikely to be carcinoid given the lack of symptoms of carcinoid syndrome. The flushing attacks of the carcinoid syndrome are accompanied by hypotension. Renal anatomy and function is studied with sequential images using radionuclides that are indexes of tubular function (¹³¹I Hippuran). The clinical history here is not suggestive of renal artery stenosis.

Given the patients' young age, and markedly raised BP on treatment, we should consider an endocrine cause. The electrolyte disturbance is mild, and is of dubious relevance in this

question. Diuretic use may be causing the hyponatraemia and hypokalaemia, indeed the commonest cause of hypokalaemia in hypertension is diuretic therapy. However, spironalactone use could, theoretically, mask a more significant hypokalaemia.

There is no clinical history to suggest Cushing's, and primary aldosteronism is not associated with a tachycardia. An aldosterone:rennin ratio would not be appropriate at this stage given that the patient is receiving spironalactone.

The history of episodic headaches is central to this question, together with the tachycardia. These paroxysmal headaches suggest the diagnosis of pheochromocytoma; often the symptoms are vague, and rarely is the classical presentation encountered.

Patients with pheochromocytoma may develop a severe vascular headache (Bridgwater and Starling, 1982). Thomas et al. (1966) reviewed the histories of 100 patients with proven pheochromocytoma seen at the Mayo Clinic and found that episodic headache was present in 80%. It was usually of rapid onset, bilateral, severe, throbbing, and associated with nausea in about half of the cases.



[Q: 607] OnExamination - Endocrinology

A 53-year-old woman presented asking for treatment to prevent osteoporosis. She was one year post-menopausal, is aware of flushes at night and has a family history of osteoporosis.

Which one of the following therapies would be most appropriate?

- 1- Calcium and vitamin D supplements
- 2- Continuous oestrogen
- 3- Cyclical etidronate and calcium
- 4- Cyclical oestrogen and progestogen
- 5- Vitamin D supplements

Answer & Comments

Answer: 4- Cyclical oestrogen and progestogen

This patient with a family history of osteoporosis is one year post-menopausal and has symptoms. Calcium and Vit D supplements with a good diet would be unnecessary and are unproven in this age group. There is no suggestion that she has had a hysterectomy and so an unopposed oestrogen would be contra-indicated. Etidronate is licensed for the prevention of further osteoporotic fractures, prophylaxis against corticosteroid induced osteoporosis and use when HRT is contra-indicated. In this patient's case, and in the absence of any specific contra-indications ?Thromboembolic disease, breast Ca, combined HRT would be the treatment of choice despite the recent literature indicating increased risk of vascular disease. One would use HRT in the symptomatic (menopausal symptoms) but not in the asymptomatic where possibly bisphosphonates would be preferred.



[Q: 608] OnExamination - Endocrinology

A 45-year-old woman presents to A+E complaining of a severe headache and vomiting for 12 hours. She was previously well and takes no medication. On examination, her temperature was 37.5C, her pulse rate was 110 beats per minute and her blood pressure was 95/60 mmHg. There was some neck stiffness and there was a right third nerve palsy with papillary involvement. Her initial investigations show.

Haemoglobin 13.6 g/dl

White cell count 14.5 x 10⁹/L

Platelets >450 x 10⁹/L

Sodium 122 mmol/l (137-144 mmol/L)

Potassium 5.2 mmol/L (3.5-4.9 mmol/L)

Urea 4.6mmol/l (3.0-6.5mmol/l)

Creatinine 85 µmol/l (60-125 µmol/l)

Random cortisol 150 nmol/L (200-700 nmol/L)
 TSH 1.1 mU/L (0.4-5 mU/L)
 Free T₄ 9 pmol/L (10-22 pmol/L)
 Prolactin 350 (<450mU/L)

What is the most likely diagnosis?

- 1- Encephalitis
- 2- Migraine
- 3- Meningitis
- 4- Pituitary apoplexy
- 5- Subarachnoid Haemorrhage

Answer & Comments

Answer: 4- Pituitary apoplexy

This patient has had an acute onset of headache secondary to haemorrhage into the pituitary gland. She has evidence of hypopituitarism given her low random cortisol, with consistent biochemical results of hyponatraemia and hyperkalaemia. Her 3rd cranial nerve palsy is due to enlargement of the pituitary producing compression of the 3rd cranial nerve. She requires resuscitation and steroid replacement, urgent imaging of the pituitary gland and consideration of neurosurgical decompression.



[Q: 609] OnExamination - Endocrinology

In the treatment of Congenital Adrenal Hyperplasia, which of the following statements is correct?

- 1- Hydrocortisone may be administered once daily
- 2- Preferred treatment in children is prednisone
- 3- Efficacy of treatment is best monitored by 17-OH progesterone and androstenedione levels
- 4- Renin activity levels are of no clinical use in treatment monitoring

- 5- Hypotension, hyperkalaemia and hyperreninaemia suggest that the dose of mineralocorticoid should be reduced

Answer & Comments

Answer: 3- Efficacy of treatment is best monitored by 17-OH progesterone and androstenedione levels

In the treatment of CAH the lowest dose of glucocorticoid that suppresses (not totally) Adrenal androgens, whilst maintaining normal growth and weight gain. Renin activity levels can be used to monitor adequacy of mineralocorticoid and sodium replacement.

Hydrocortisone has a relatively short half-life and must therefore be administered twice daily, whilst the preferred mode of glucocorticoid replacement in children is hydrocortisone as it minimises growth suppression. Over treatment with mineralocorticoids leads to hypertension, suppressed plasma rennin activity and possibly growth retardation.



[Q: 610] OnExamination - Endocrinology

Growth hormone deficiency is noted in:

- 1- Turner's syndrome
- 2- Constitutional short stature
- 3- Laron's syndrome
- 4- Sheehan's syndrome
- 5- Chronic renal failure

Answer & Comments

Answer: 4- Sheehan's syndrome

Sheehan's syndrome is post-delivery infarction of the pituitary and GHD is typical. Although GH therapy is used in CRF, Turner's syndrome and short stature, subjects are not GH deficient. Laron's syndrome is due to a GH receptor defect with impaired IGF-1 production.



[Q: 611] OnExamination -
Endocrinology

A 70 year-old female is diagnosed with anaplastic thyroid cancer.

What is the most likely consequence of this cancer?

- 1- Brain metastases
- 2- Hypercalcaemia from bony metastases
- 3- Liver metastases
- 4- Lung metastases
- 5- Upper airways obstruction

Answer & Comments

Answer: 5- Upper airways obstruction

Anaplastic thyroid cancer carries a very poor prognosis with the vast majority (~90%) having local invasion (cervical lymph glands) and local infiltration, (particularly the trachea) at diagnosis. Lung and bone metastases are common at presentation ~ 50%. Upper airways obstruction frequently requires tracheostomy.



[Q: 612] OnExamination -
Endocrinology

Which of the following is regarded as a physiological effect of thyroid hormones?

- 1- Decrease gluconeogenesis
- 2- Enhance insulin sensitivity
- 3- Reduce myocardial oxygen demand
- 4- Reduce nerve conduction
- 5- Reduce oxidation of fatty acids in tissues

Answer & Comments

Answer: 2- Enhance insulin sensitivity

Thyroid hormones enhance insulin-dependent entry of glucose into cells, myocardial oxygen consumption, nerve conduction, gluconeogenesis and oxidation of fatty acids



[Q: 613] OnExamination -
Endocrinology

A 51-year-old man is found to have bilateral breast enlargement. He says that this is normal for him and that he has not noted any change in years. He shaves infrequently and has scant pubic hair.

Which of the following is most likely to be present?

- 1- 47, XXY karyotype
- 2- History of antidepressant drug therapy
- 3- Increased risk for breast carcinoma
- 4- Increased testosterone levels
- 5- Seminoma of the testis

Answer & Comments

Answer: 1- 47, XXY karyotype

Gynaecomastia is common with Klinefelter's syndrome. Male breast cancer is rare and is more often associated with advanced age. There is an association between gynaecomastia and some functioning testicular tumors such as Leydig cell tumors (or rarely, Sertoli cell tumors). Gynaecomastia is related to conditions of high oestrogens, and one of the most common causes for this is cirrhosis of the liver in chronic alcoholics.



[Q: 614] OnExamination -
Endocrinology

An 18-year-old female with polycystic ovary syndrome was prescribed Metformin.

What is the most important pharmacological action of Metformin in this situation?

- 1- Increasing insulin levels
- 2- Increasing luteinising hormone levels
- 3- Increasing oestradiol levels
- 4- Increasing peripheral glucose uptake
- 5- Increasing gluconeogenesis

Answer & Comments

Answer: 4- Increasing peripheral glucose uptake

Lowering serum insulin concentrations with metformin ameliorates hyperandrogenism, by reduction of ovarian enzyme activity that results in ovarian androgen production.

Clinical studies have shown that metformin reduces insulin resistance, and have demonstrated a fall in serum androgens, luteinising hormone and weight. The reduced insulin resistance is associated with reduced insulin drive to the insulin sensitive ovary in polycystic ovarian syndrome and hence reduces androgen production.



[Q: 615] OnExamination - Endocrinology

A 51-year-old district nurse presented with a history of near fainting episodes, which were promptly relieved by eating chocolates. At her last hospital admission, her simultaneous blood results were as follows:

plasma glucose 1.8 mmol/L

serum insulin 58 pmol/L (<21)

c-peptide undetectable

What is the most likely diagnosis?

- 1- alcohol induced hypoglycaemia
- 2- exogenous insulin administration
- 3- growth hormone deficiency
- 4- insulinoma
- 5- sulfonylurea induced hypoglycaemia

Answer & Comments

Answer: 2- exogenous insulin administration

The story of a middle aged woman who has spontaneous hypoglycaemia and inappropriately high insulin (should be undetectable in presence of hypoglycaemia) would suggest insulinoma. Yet, the c-peptide

is undetectable (indicating she has been administering insulin as the c-peptide is released with endogenous insulin) and her occupation suggests drug abuse - in this case insulin.



[Q: 616] OnExamination - Endocrinology

A 30-year-old female presents with mild galactorrhoea. Biochemistry reveals an elevated prolactin of 1200 mu/l (NR 50-450) and an oestradiol concentration of 100 pmol/l (NR 130-450).

Which of the following is the likely cause?

- 1- Addison's disease
- 2- Hyperthyroidism
- 3- Non-functioning pituitary tumour
- 4- Sheehan's syndrome
- 5- Post-cranial irradiation for acute lymphocytic leukaemia as a child

Answer & Comments

Answer: 3- Non-functioning pituitary tumour

Addison's may be associated with hypogonadism but prolactin concentrations are usually normal. Severe hypothyroidism is associated with HyperPRL hypogonadism. A NFPT may cause hyperprolactinaemia through stalk compression. Sheehan's syndrome is associated with a low prolactin concentration. Cranial irradiation may initially cause hyperprolactinaemia but a low PRL is typical after a year.



[Q: 617] OnExamination - Endocrinology

A patient is receiving treatment with recombinant human growth hormone.

Which of the following is a recognised side effect of GH therapy?

- 1- Prostatic hypertrophy

- 2- Melanoma
- 3- Benign intra-cranial hypertension
- 4- Prolongation of the QT interval
- 5- Osteoporosis

Answer & Comments

Answer: 3- Benign intra-cranial hypertension

GH is rarely associated with BIH, the mechanism probably is related to fluid retention. The commonest side effect of GH therapy is fluid retention, though other side effects include gynaecomastia, hypertension and atrial fibrillation. BPH has not been reported.



[Q: 618] OnExamination - Endocrinology

Leptin

- 1- Is synthesised in the hypothalamus
- 2- Reduces Basal metabolic rate
- 3- Acts upon the adipocyte
- 4- Produces satiety
- 5- Plasma concentrations correlate directly with lean body mass.

Answer & Comments

Answer: 4- Produces satiety

Leptin is synthesised within the adipocyte and plasma concentrations are directly related to adipocyte (fat) mass. It acts on centres within the hypothalamus to produce satiety.



[Q: 619] OnExamination - Endocrinology

A 47-year-old female of Asian origin presents with a long history of deteriorating weakness and fatigue. Of late, she has difficulty ascending stairs at home need to crawl up them. She has a six year history of type 2 diabetes mellitus and is treated with Metformin and Gliclazide.

Initial X-rays reveal healing clavicular fractures, and a superior pubic rami fracture.

Her investigations show:

Calcium 2.2 mmol/l (2.2 - 2.5 mmol/l)

Phosphate 0.7 mmol/l (0.8 - 1.5 mmol/l)

Alkaline Phosphatase 212 iu/l (50 - 110 IU/L)

AST 30 iu/l (5 - 40 IU/l)

Urea 12 mmol/l (3 - 8 mmol/l)

Creatinine 67 µmol/l (50 - 100 µmol/L)

HbA1c 11.0% (4 - 6%)

What is the likely diagnosis?

- 1- Advanced diabetic renal disease
- 2- Diabetic amyotrophy
- 3- Hypoparathyroidism
- 4- Osteoporosis
- 5- Vitamin D deficiency

Answer & Comments

Answer: 5- Vitamin D deficiency

This patient has vitamin D deficiency. It classically presents in the female Asian population whose clothing offers little exposure to sunlight. The phosphate and calcium are usually low normal, and the alkaline phosphatase is high. Bone deformity ?rickets may develop in children. Fractures can occur due to bone demineralisation with osteoporosis on DEXA. Proximal myopathy is often a presenting feature of osteomalacia as is probably the case with this patient.



[Q: 620] OnExamination - Endocrinology

A 55-year-old female who received radioactive iodine over five years ago presents for annual thyroid function assessment. She is well and takes no medication.

Her results reveal:

Free Thyroxine 13.2 pmol/l (9.8 - 23)

TSH 16 mU/l (0.5-4.5 mU/l)

Total cholesterol 6.8 mmol/l (<5 mmol/l)

Plasma triglycerides 2.2 mmol/l (<2 mmol/l)

What is the most appropriate treatment for this patient's dyslipidaemia?

- 1- Cholestyramine
- 2- Fibrate therapy
- 3- Hormone replacement therapy
- 4- Statin therapy
- 5- Thyroxine

Answer & Comments

Answer: 5- Thyroxine

This patient has subclinical hypothyroidism as reflected by the normal T4 but elevated TSH. A hypercholesterolaemia with hypertriglyceridaemia is frequently associated due to impaired lipoprotein lipase function. The dyslipidaemia may well resolve following the appropriate replacement with thyroxine.



[Q: 621] OnExamination - Endocrinology

Which of the following has a known association with phenylketonuria?

- 1- Presentation in the second year of life with absence seizures.
- 2- The association of red hair and brown eyes.
- 3- Normal development.
- 4- Musty odour.
- 5- Response of some patients to piridoxine.

Answer & Comments

Answer: 4- Musty odour.

Phenylketonuria is a quarter as common as congenital hypothyroidism, with an incidence of 1:10,000 live births. It is due either to phenylalanine hydroxylase deficiency or problems with synthesis or recycling of the

bioptine co-factor. The presentation is with infantile spasms or developmental delay between 6 and 12 months of age. Patients may be musty smelling, fair haired and blue eyed and may develop eczema. Treatment is with restriction of dietary phenylalanine, while ensuring sufficient for physical and neurological growth. Co-factor defects are treated with a diet low in phenylalanine and high in neurotransmitter precursors.



[Q: 622] OnExamination - Endocrinology

A 35 year-old woman presented with a five year history of weight gain associated with a one year history of amenorrhoea. Over this time she had also noticed hirsutism and had been trying to conceive. On examination, she had a BMI of 32 kg/m², a pulse was 84 beats per minute, and a blood pressure of 154/100 mmHg. Features suggestive of Cushing's syndrome were also noted.

Which of the following would be the most useful initial investigation?

- 1- 24 hour urinary free cortisol concentration
- 2- Combined 9am ACTH concentration and serum cortisol concentration
- 3- Midnight cortisol concentration
- 4- Serum sodium and potassium concentrations
- 5- The 1mg overnight dexamethasone suppression test

Answer & Comments

Answer: 1- 24 hour urinary free cortisol concentration

A ridiculous question! Totally unfair expecting candidates to know which screening test is better ?1 mg ODST or UFC. Either test would be appropriate, but UFC is often recommended and has a 95% specificity (85% specificity in the obese) and a 98% sensitivity. The ODST has a sensitivity and specificity of

98% and 75-80% in obese subjects with a cut-off value of 50 nmol/l. Therefore, purely for convenience sake a UFC would probably be the expected response here. Midnight cortisol is pointless as a screening test expecting the patient to be fast asleep when blood is taken. Sodium and Potassium concentrations offer nothing, nor do ACTH and cortisol.



[Q: 623] OnExamination - Endocrinology

Which of the following is a likely presenting feature of Cushing's syndrome

- 1- Lichen planus
- 2- Mononeuritis multiplex
- 3- Polymyositis
- 4- Necrosis of the femoral head
- 5- Diabetes insipidus

Answer & Comments

Answer: 4- Necrosis of the femoral head

Cases of Cushing's Syndrome have presented with necrosis of the femoral head due to osteoporosis. Diabetes insipidus would be very unusual, whereas diabetes mellitus may occur in 30%. Lichen planus is treated with corticosteroids, as is polymyositis. Mononeuritis multiplex is not a feature.



[Q: 624] OnExamination - Endocrinology

A 53-year-old female with surgically treated acromegaly is receiving treatment with Octreotide therapy due to persistently elevated growth hormone concentrations following surgery.

What is the mechanism of action of Octreotide?

- 1- Inhibition growth hormone receptor
- 2- Inhibition of dopamine D2 receptor
- 3- Inhibition of IGF-1 receptor

- 4- Inhibition of GHRH receptor
- 5- Stimulation of the somatostatin receptor

Answer & Comments

Answer: 5- Stimulation of the somatostatin receptor

Octreotide is a somatostatin analogue and directly inhibits growth hormone secretion through interaction with its receptors. It is also used in the treatment of neuroendocrine tumours such as carcinoid tumours again through interaction with somatostatin receptors.



[Q: 625] OnExamination - Endocrinology

A 63-year-old male with a five year history of diet controlled type 2 diabetes presents with deteriorating glycaemic control and is started on treatment to control his hyperglycaemia. Then, later, he presents with dyspnoea and orthopnoea. He is diagnosed with left ventricular failure.

Which of the following drugs used in the control of his hyperglycaemia may have contributed to this episode of heart failure?

- 1- Glibenclamide
- 2- Glimiperide
- 3- Insulin glargine
- 4- Metformin
- 5- Rosiglitazone

Answer & Comments

Answer: 5- Rosiglitazone

Glitazone treatment is associated with fluid retention and consequently may exacerbate/precipitate heart failure. This was a key finding in the PROACTIVE study which is one of the largest glitazone trials to have been reported.

Metformin is relatively safe in stable heart failure but must be used in caution with those prone to deterioration in renal function.



[Q: 626] OnExamination - Endocrinology

A 70 year-old female presents with a six month history of frontal headaches and weight loss. On examination a bitemporal hemianopia was noted.

Which of the following suggest the diagnosis of a pituitary tumour?

- 1- 9am cortisol concentration of 350 nmol/L (200 - 700)
- 2- LH concentration of 44 uL (>30)
- 3- Prolactin concentration of 580 mU/L (50-550)
- 4- Random growth hormone concentration 1.2 mU/L (< 1)
- 5- TSH concentration of 3.8 mU/L (0.5 - 4.5)

Answer & Comments

Answer: 3- Prolactin concentration of 580 mU/L (50-550)

The raised prolactin would most likely reflect stalk compression in this patient. Otherwise, the normal cortisol would be unhelpful as is the normal TSH. The elevated LH is a reflection of this patient being menopausal. GH concentrations are frequently undetectable as it is released episodically usually during the night.



[Q: 627] OnExamination - Endocrinology

A 38-year-old male presents with concerns relating to obesity.

What is the average daily energy used by a male of this age?

- 1- 1500 kcal
- 2- 2000 kcal

- 3- 2500 kcal
- 4- 3000 kcal
- 5- 3500 kcal

Answer & Comments

Answer: 3- 2500 kcal

The average daily energy consumption of a male is 2500 kcal and 2000 kcal for a female. These values are important when determining the dietary calorie restriction.



[Q: 628] OnExamination - Endocrinology

A 32-year-old female presents with a 2 month history of agitation, menstrual irregularity and weight loss. Examination reveals a tremor and a palpable goitre with a bruit.

Which of the following would most likely be present in this patient:

- 1- Thyroid microsomal antibodies
- 2- Thyroid peroxidase antibodies
- 3- TSH receptor stimulating antibodies
- 4- TSH receptor inhibiting antibodies
- 5- Anti-thyroglobulin antibody

Answer & Comments

Answer: 3- TSH receptor stimulating antibodies

This patient is most likely to have Graves' disease as revealed by the thyroid bruit. TSH receptor stimulating antibody is specific for Graves' disease and is present in the vast majority of cases.



[Q: 629] OnExamination - Endocrinology

Low uptake of ¹²³I on the thyroid uptake scan would be an expected finding in:

- 1- A solitary toxic nodule
- 2- A multi-nodular toxic goitre

- 3- Amiodarone induced thyrotoxicosis type 1
- 4- DeQuervain's thyroiditis
- 5- Graves' thyrotoxicosis

Answer & Comments

Answer: 4- DeQuervain's thyroiditis

DeQuervain's thyroiditis is classically associated with low or absent ^{123}I (or ^{131}I radioactive isotopes of iodine) uptake. The others will have high or normal uptake. In particular type 1 amiodarone induced thyrotoxicosis may be distinguished from the thyroiditis of type 2 by the normal or high uptake scan.



[Q: 630] OnExamination - Endocrinology

A 32-year-old woman presents with a four month history of amenorrhoea. She takes no specific therapy. She has two children and her husband has a vasectomy. Examination reveals an obese individual but no other abnormality.

Investigations reveal:

Serum oestradiol 100 pmol/L (NR 130 - 500)

Serum LH 2.1 mU/L (NR 3.0 - 6.6)

Serum FSH 2.2 mU/L (NR 3.3 - 10.1)

Serum prolactin 800 mU/L (NR 50 - 500)

Serum testosterone 2.1 pmol/L (NR < 3.0)

Which investigation is the most appropriate?

- 1- Insulin tolerance test
- 2- Pregnancy test
- 3- 17 hydroxy-progesterone
- 4- Urine free cortisol concentration
- 5- Magnetic resonance imaging (MRI) of the pituitary

Answer & Comments

Answer: 5- Magnetic resonance imaging (MRI) of the pituitary

This patient has hypogonadotrophic hypogonadism as evidenced by suppressed LH/FSH and a low oestradiol concentration. This would exclude pregnancy as a cause and polycystic ovarian syndrome is also unlikely. In the presence of a raised prolactin concentration, a microprolactinoma would be the most likely explanation for this patient's symptoms and results. This may be demonstrated by a pituitary MRI scan. An insulin tolerance test would usually be entirely normal in a microprolactinoma.



[Q: 631] OnExamination - Endocrinology

A 17 year-old male student presents with a three week history of thirst, polyuria, balanitis and weight loss.

What is the most appropriate next investigation?

- 1- 75 g glucose tolerance test
- 2- Fructosamine concentration
- 3- HbA1c
- 4- Random plasma glucose concentration
- 5- Urinary ketones

Answer & Comments

Answer: 4- Random plasma glucose concentration

This patient obviously has diabetes mellitus and the diagnosis should be confirmed with either a fasting plasma glucose above 7 mmol/l or a random plasma glucose above 11.1 mmol/l.



[Q: 632] OnExamination - Endocrinology

A 53-year-old female presents with a four

month history of weight gain, episodic sweats and shakiness which occur during episodes of fasting and is relieved by eating chocolate bars. She informs you that she has a friend who is a nurse and has provided her with a glucose meter. During one of these episodes the glucose concentration was recorded at 2.8 mmol/l. On examination she has a body mass index of 30.2 kg/m², has a pulse of 82 bpm and a blood pressure of 144/86 mmHg. No other abnormalities are noted.

Which of the following is the most appropriate next investigation for this woman?

- 1- 72 hour fast
- 2- Fasting insulin and c-peptide measurement
- 3- MRI pancreas
- 4- Oral glucose tolerance test
- 5- Sulphonylurea measurement

Answer & Comments

Answer: 1- 72 hour fast

This woman has features of spontaneous hypoglycaemia which is relieved by eating and precipitated by fast and exercise. The most relevant investigation to prove or disprove this would be a 72 hr fast which has a virtual 99% sensitivity. If proven then further investigation for an insulinoma or factitious hypoglycaemia is warranted.



[Q: 633] OnExamination - Endocrinology

On routine screening of a 50-year-old woman who complained of tiredness, she is found to be hypercalcaemic. She is being treated for manic depression, and cardiac failure.

Which of the following is most likely to be the cause of the raised calcium?

- 1- ACE Inhibitor therapy
- 2- Furosemide therapy
- 3- Lithium therapy

- 4- Seroxat treatment
- 5- Vitamin D deficiency

Answer & Comments

Answer: 3- Lithium therapy

Lithium can produce Diabetes Insipidus and also raise calcium. Neither Seroxat nor ACE Inhibitors are related to hypercalcaemia. Excess of vitamin D causes elevated calcium. Furosemide lowers calcium but thiazides reduce excretion and so can exacerbate hypercalcaemia.



[Q: 634] OnExamination - Endocrinology

A 57-year-old male diabetic requests Sildenafil for erectile dysfunction.

Which of the following are contraindicated with Sildenafil?

- 1- Carbamazepine
- 2- Carvedilol
- 3- Indomethacin
- 4- Nicorandil
- 5- Valsartan

Answer & Comments

Answer: 4- Nicorandil

Sildenafil is contraindicated if the patient is taking nitrates, or nitrate derivatives (nicorandil). We are informed on the prescribing information that if the patient takes nitrates then they should be stopped for the period during which Sildenafil is used.



[Q: 635] OnExamination - Endocrinology

A 58-year-old male presents with a six month history of marked sweating. Examination reveals large hands, feet and coarse facial features. His blood pressure is 172/102 mmHg.

What is the explanation for the excessive sweating in this man?

- 1- Increased Catecholamine secretion
- 2- Increased bradykinin release
- 3- Reduced sex hormone secretion
- 4- Sweat gland hypertrophy and hyperplasia
- 5- Organomegaly with increased thermogenesis

Answer & Comments

Answer: 4- Sweat gland hypertrophy and hyperplasia

This man has features of acromegaly and the hyperhidrosis is a symptom. The mechanisms are not entirely clear and to me this is a stupid question but the RCP are full of occasional stupid questions. I suspect that the numbskull that composed such a question for the RCP had actually performed the research on this particular area!

However, as this type of question is asked, it is our duty to provide such themes. In acromegaly it appears that the increased sweating relates to sweat gland hyperplasia.



[Q: 636] OnExamination - Endocrinology

A 17 year-old female is referred following a visit to the dentist where marked erosion of her teeth was noted. She was entirely asymptomatic and her only medication was the oral contraceptive pill. On examination her blood pressure was 110/70 mmHg and her body mass index was 21.5 kg/m² (18 - 25).

Investigations

sodium 135 mmol/l

potassium 2.1 mmol/l

bicarbonate 42 mmol/l

urea 2.6 mmol/L

corrected calcium 2.08 mmol/l

alkaline phosphatase 201 iu/l (50-110)

What is the most likely diagnosis?

- 1- Bulimia nervosa
- 2- Conn's syndrome
- 3- Laxative abuse
- 4- Pregnancy
- 5- Primary hypoparathyroidism

Answer & Comments

Answer: 1- Bulimia nervosa

This patient has tooth erosion associated with hypokalaemic metabolic alkalosis and hypocalcaemia. This suggests a diagnosis of bulimia which may cause a mild hypocalcaemia. Hypoparathyroidism is a possible answer but the alkaline phosphatase would be expected to be normal/low with this condition. Again tooth erosion and the like is typical of primary hypoparathyroidism. Conn's is unlikely in this age group, is not associated with tooth erosion and hypertension would be expected. Laxative abuse would be associated with hypokalaemia but the hypocalcaemia with raised alkaline phosphatase would not be expected. Early pregnancy would not fit this picture.



[Q: 637] OnExamination - Endocrinology

A 46-year-old male presents passing 4-5 litres of urine per day, after commencing a new drug.

Serum sodium 142 mmol/l

Plasma osmolality 295 mosmol/l (275-290)

Urine osmolality 280 mosmol/l (350-1000)

What drug was prescribed?

- 1- Carbamazepine
- 2- Chlorpropamide
- 3- Fluoxetine
- 4- Furosemide

5- Lithium

Answer & Comments

Answer: 5- Lithium

The patient appears to have a drug induced Diabetes Insipidus based upon the high urine output, low urine osmolality and the high plasma osmolality. The most likely cause is Lithium. Chlorpropamide causes a SIADH as does carbamazepine and fluoxetine. Furosemide is another possibility but if it had dried the patient out the plasma sodium would be expected to be higher. It is most likely that the patient has started lithium for a psychiatric disorder. A 46-year-old male would be unlikely to be receiving high doses of furosemide.



[Q: 638] OnExamination - Endocrinology

A 45-year-old male is found to have a 2cm right adrenal adenoma which was noted co-incidentally following abdominal CT scan performed for investigation of abdominal pain. There are no abnormalities on examination and the patient is quite well with a blood pressure of 122/84 mmHg. Urine catecholamines are normal, urine free cortisol normal and plasma renin activity:aldosterone ratio is normal.

Which is the most appropriate management step for this patient?

- 1- Arrange PET scan
- 2- Arrange adrenalectomy
- 3- Characterise further with MRI
- 4- Repeat imaging in 6 months
- 5- Reassure and discharge

Answer & Comments

Answer: 4- Repeat imaging in 6 months

This appears to be an adrenal incidentaloma as evidenced by the normal endocrine

investigations. Similarly, its small size would argue against this being an adrenal carcinoma, with the cut-off for surgery being approx 4cm. However, it is important to ensure that the lesion is not growing and therefore repeat scanning in approx 6 months is required. If the tumour were enlarging then surgery may be indicated. CT is typically as good as MRI in the imaging of the adrenal, therefore one would not request a MR now as the CT imaging would be adequate.



[Q: 639] OnExamination - Endocrinology

A 17 year female presents with tingling and muscle cramps. There is no other past medical history of note. Investigations reveal

Creatinine 68 micromol/L (50-100)

calcium 1.76 mmol/L (2.2-2.6)

albumin 38 g/L (37-49)

Which one of the following investigations is most likely to confirm the diagnosis?

- 1- Alkaline phosphatase concentration
- 2- CT brain scanning
- 3- PTH concentration
- 4- Urine calcium concentration
- 5- Vitamin D concentration

Answer & Comments

Answer: 3- PTH concentration

This patient has low calcium which could be due to either Vitamin D deficiency or hypoparathyroidism. The most likely cause in a young patient who has otherwise been quite well with normal renal function would therefore be hypoparathyroidism. Urine calcium concentrations are useful in familial hypercalciuric hypercalcaemia.



[Q: 640] OnExamination -
Endocrinology

Which of the following statements are true of primary hyperparathyroidism?

- 1- It is associated with hypocalciuria due to elevated PTH levels.
- 2- PTH is secreted in a pulsatile manner from the posterior pituitary and acts through PTH receptors on parathyroid cell membranes
- 3- It is usually caused by an adenoma of a single parathyroid gland.
- 4- It progresses to tertiary hyperparathyroidism with time.
- 5- It is associated with bone resorption by PTH to restore depressed serum calcium levels to normal.

Answer & Comments

Answer: 3- It is usually caused by an adenoma of a single parathyroid gland.

"Primary HPT can be divided pathologically into adenoma, hyperplasia, and carcinoma. Adenomas clearly are the most prevalent entity representing 80-85% of cases. Hyperplasia is the second most common diagnosis constituting 15% of cases. Carcinoma represents <1% of total cases. Double adenoma has been found in approximately 5% of the time, and complicates the clinical distinction between adenoma and hyperplasia. Histologically, normal parathyroid tissue shows a cell to fat ratio of 1:1. Hypercellular parathyroid tissue is typified by the loss of the normal amount of fat."

In primary hyperparathyroidism there is usually hypercalciuria. Secondary hyperparathyroidism may progress to tertiary but primary does not.



[Q: 641] OnExamination -
Endocrinology

Which of the following is typically found in Pendred's syndrome

- 1- Mental retardation
- 2- Sensorineural deafness
- 3- Thyroid agenesis
- 4- Thyrotoxicosis
- 5- Cataract

Answer & Comments

Answer: 2- Sensorineural deafness

Pendred's syndrome is an autosomal recessive condition which includes nerve deafness with goitre due to a defect of iodine binding. Patients are usually euthyroid.



[Q: 642] OnExamination -
Endocrinology

A 16-year-old male with a day history of malaise, weakness and vomiting. He was diagnosed with Insulin dependent diabetes mellitus 3 years previously.

Which ONE of the following supports a diagnosis of diabetic ketoacidosis:

- 1- Abdominal pain at onset
- 2- A serum standard bicarbonate of 10 mmol/l (NR 22-26)
- 3- A random serum glucose 14 mmol/l (NR 4.5-6-4)
- 4- Decreased appetite in the past few days
- 5- Shallow respirations

Answer & Comments

Answer: 2- A serum standard bicarbonate of 10 mmol/l (NR 22-26)

1-An unusual but recognised feature particularly in children. However does not support a diagnosis of DKA. 2-The low plasma bicarbonate is highly suggestive of a metabolic

acidosis. 3-'Normoglycaemic DKA' can occur and a glucose of 14 is compatible with a diagnosis but is not suggestive as one might expect to find these sort of concentrations with diabetes per se. 4-Usually patients are unwell with infections and anorexia. Fasting is itself associated with the presence of ketones in the urine but not necessarily ketoacidosis. 5-Respiratory compensation leads to rapid deep (Kussmaul's) breathing.



[Q: 643] OnExamination - Endocrinology

A 28-year-old female presents in the 24th week of pregnancy with profound tiredness and anxiety. Examination reveals a tremor, a pulse of 100 beats per minute and a soft bruit heard over the thyroid gland.

Thyroid function tests show:

Free T₄ 32.9 pmol/l (NR 9.8 - 23.1)

TSH 0.04 mu/l (NR 0.5 - 4)

Which of the following treatments would you select for this patient?

- 1- Radioactive iodine therapy
- 2- Carbimazole
- 3- Lithium
- 4- Propranolol
- 5- Potassium perchlorate

Answer & Comments

Answer: 2- Carbimazole

This patient has Graves' disease and the most appropriate treatment for the thyrotoxicosis is carbimazole. This she should receive in the lowest dose to maintain euthyroidism. A block and replacement regime is not appropriate in pregnancy. Radioactive iodine is contra-indicated as it would also be taken up by the foetal thyroid. Propranolol would ameliorate the symptoms but may impact upon the fetus. Lithium is contra-indicated in pregnancy as is

potassium perchlorate. Of course surgery may also be used in severe cases.

Both carbimazole and propylthiouracil may (and should) be used in pregnancy. Many prefer propylthiouracil because there is some evidence that it may be less likely to be transferred across the placenta.



[Q: 644] OnExamination - Endocrinology

A 26-year-old man with a past history of parathyroid surgery presented with galactorrhoea.

Investigations:

plasma follicle-stimulating hormone 4.2 U/L (1-7)

plasma luteinising hormone 5.6 U/L (1-10)

plasma prolactin 1654 mU/L (<360)

plasma thyroid-stimulating hormone 3.8 mU/L (0.4-5)

insulin-like growth factor 1 33.4 nmol/L (7.5-37.3)

Which of the following is the most likely diagnosis?

- 1- MEN type 1
- 2- MEN type 2a
- 3- MEN type 2b
- 4- Polyglandular syndrome type 1
- 5- Polyglandular syndrome type 2

Answer & Comments

Answer: 1- MEN type 1

The story of galactorrhoea suggests hyperprolactinaemia and in the context of primary hyperparathyroidism suggests MEN type 1. MEN type 1 is an autosomal dominant condition and is associated with hyperparathyroidism, pancreatic neuroendocrine tumours and pituitary tumours.



[Q: 645] OnExamination -
Endocrinology

A 55-year-old female presents with episodic sweats and tremors which are relieved by glucose. She has gained approximately 6 kg in weight of late and drinks approximately 10 units of alcohol weekly.

Her investigations show normal Full Blood Count, Normal Urea and electrolytes and a fasting plasma glucose concentration of 4 mmol/l (3-6).

What is the most appropriate investigation for this patient?

- 1- 72 hour fast
- 2- CT scan of pancreas
- 3- EEG
- 4- Insulin and C-peptide concentration
- 5- Oral glucose tolerance test

Answer & Comments

Answer: 1- 72 hour fast

This patient describes symptoms suggestive of hypoglycaemia which are relieved by carbohydrate. The likely cause is an insulinoma which is producing the weight gain.

The standard method for achieving a diagnosis is during a 72 hour fast by demonstration of inappropriately high insulin and C peptide during spontaneous hypoglycaemia.

Measurement of C-peptide is useful for excluding factitious hypoglycaemia from self injection of insulin. Insulin preparations contain no C-peptide.



[Q: 646] OnExamination -
Endocrinology

Which of the following is a feature of Cushing's syndrome?

- 1- Fibrous dysplasia

- 2- Vertebral collapse
- 3- Calcium pyrophosphate arthropathy
- 4- Osteomalacia
- 5- Osteoarthritis

Answer & Comments

Answer: 2- Vertebral collapse

Vertebral collapse may be due to osteoporosis. Osteoarthritis and gout would be unusual with elevated corticosteroid concentrations. Osteomalacia is not a feature.



[Q: 647] OnExamination -
Endocrinology

An 17-year-old female presented with a one year history of secondary amenorrhoea. She had been prescribed Temazepam and Dihydrocodeine previously.

On examination she had galactorrhoea to expression. Her prolactin concentration was 6000 mu/l (NR 50-450). Pregnancy test was negative.

What is the most likely diagnosis?

- 1- Drug-induced hyperprolactinaemia
- 2- Non functioning pituitary tumour
- 3- Pituitary microadenoma
- 4- Polycystic ovarian syndrome
- 5- Turner's syndrome

Answer & Comments

Answer: 3- Pituitary microadenoma

The history and examination findings together with the grossly elevated prolactin concentration are suggestive of a microprolactinoma. This is not Polycystic Ovarian Syndrome as the hyperprolactinaemia is far too high. The drugs that she is taking would not cause hyperprolactinaemia as agents such as dopamine antagonists, antipsychotic agents and tricyclic

antidepressants may be responsible. If she were to have a non-functioning pituitary tumour, stalk c



[Q: 648] OnExamination - Endocrinology

A 16-year-old female with Addison's disease is intolerant of her hydrocortisone treatment which she takes at a dose of 20mg in the morning and 10mg in the evening.

Which of the following doses of prednisolone would provide an equivalent daily dose as her hydrocortisone?

- 1- 5mg
- 2- 7.5mg
- 3- 10mg
- 4- 12.5mg
- 5- 15mg

Answer & Comments

Answer: 2- 7.5mg

The equivalent ratio of prednisolone to hydrocortisone is approximately 1:4. For Dexamethasone to Hydrocortisone the ratio is roughly 1:24.



[Q: 649] OnExamination - Endocrinology

A diagnosis of diabetes mellitus is being considered in 32-year-old woman who is 16 weeks pregnant. Her body mass index (BMI) was 22 kg/m² (18 - 25). A 75g oral glucose tolerance test was reported as follows

Time	Plasma glucose concentration	Normal range
0 hr	6.0 mmol/l	3.0-6.0
2hr	12.5 mmol/l	<11.1

Which of the following is the most appropriate next step in the management of this patient?

- 1- Glipizide therapy

- 2- Insulin therapy
- 3- Low calorie diet
- 4- Metformin therapy
- 5- Repeat OGTT in four weeks

Answer & Comments

Answer: 2- Insulin therapy

The result confirms a diagnosis of gestational diabetes mellitus with the 2hr OGTT result above 11.1 mmol/l. To minimise the fetal consequences of GDM (macrosomia, fetal malformations, still birth, IUGR etc), the patient's glycaemia should be strictly controlled with insulin. A low calorie diet is inappropriate and neither metformin nor glipizide are licenced for use in pregnancy. There is no point in repeating the OGTT in 4 weeks as control is required NOW.



[Q: 650] OnExamination - Endocrinology

A 16-year-old female presents with hypertension and increasing weight.

Which of the following features would be most suggestive of Cushing's syndrome rather than simple obesity?

- 1- Abdominal striae
- 2- Acanthosis Nigricans
- 3- Buffalo Hump (interscapular fat pad)
- 4- Moon face
- 5- Proximal myopathy

Answer & Comments

Answer: 5- Proximal myopathy

Proximal myopathy, easy bruising and thin skin are clinical features that are most suggestive of Cushing's syndrome. Otherwise, abdominal striae, buffalo hump, and acanthosis nigricans are all features of obesity. Similarly Oligomenorrhoea would be a feature of obesity/polycystic ovarian syndrome.



[Q: 651] OnExamination -
Endocrinology

A 45-year-old woman presents with excessive hair growth on her face, chest and lower abdomen.

Which of the following may be associated with her condition?

- 1- Cyproterone
- 2- Hypoadrenalism
- 3- Minoxidil
- 4- Moxonidine
- 5- Valproate

Answer & Comments

Answer: 3- Minoxidil

Drugs causing hirsutism/hypertrichosis include minoxidil (not moxonidine - a centrally acting anti-hypertensive), phenytoin (not valproate) and cyclosporin. Polycystic ovaries and congenital adrenal hyperplasia are associated with increased androgens and hirsutism; hypoadrenalism may be associated with loss of hair ?especially pubic hair. Treatment of hirsutism is with anti-androgens (cyproterone, spironolactone), reduction of free androgens (oestrogen therapy, OCP, weight loss), and cosmetic treatment for removal of hair.



[Q: 652] OnExamination -
Endocrinology

A previously fit 30-year-old male presents with a two months history of weight loss, tiredness and nausea.

Investigations show:

Haemoglobin 10.5 g/dL
MCV 88 fL
White cell count $6.0 \times 10^9/L$
Platelets $450 \times 10^9/L$
Serum sodium 130 mmol/L

Serum potassium 5.7 mmol/L
Serum urea 3.0 mmol/L
Serum creatinine 78 $\mu\text{mol/L}$
Serum total T_4 55 nmol/L (NR 50-150)
Serum TSH 8 mU/L (NR 0.2-5.5)

Which of the following is the most useful diagnostic investigation?

- 1- anti-thyroid peroxidase antibody titre
- 2- insulin tolerance test
- 3- free thyroxine concentration
- 4- short synacthen test
- 5- TRH test

Answer & Comments

Answer: 4- short synacthen test

This patient presents with weight loss, tiredness and nausea. He has hyponatraemia, hyperkalaemia and what appears to be a mild primary hypothyroidism. The diagnosis is likely to be Addison's (primary hypoadrenalism) disease and the most appropriate test would be a short synacthen test.

The link between Addison's and primary hypothyroidism is that they are both conditions in the complex of autoimmune polyendocrine syndrome. Other possible associations of this cluster would be Type 1 Diabetes, vitiligo, pernicious anaemia and chronic active hepatitis.

An insulin tolerance test is contra-indicated in patient's in whom cortisol is less than 100 nmol/L. A TRH test is rarely performed these days and really is an irrelevance.



[Q: 653] OnExamination -
Endocrinology

A 26-year-old woman presents with episodes of dizziness mainly on standing. Her biochemical profile shows hyperkalaemic acidosis.

Which underlying condition is she most likely to have?

- 1- Cushing's syndrome
- 2- Addison's disease
- 3- Conn's syndrome
- 4- Type 1 renal tubular acidosis
- 5- Bulimia nervosa

Answer & Comments

Answer: 2- Addison's disease

Her symptoms are suggestive of postural hypotension, which together with hyperkalaemic (and hyponatraemia) acidosis would strongly indicate the presence of Addison's disease. Cushing's and Conn's syndromes are associated with hypertension and hypokalaemia. Hypokalaemia is the most frequent complication of bulimia which may cause cardiac arrhythmias, fits and paraesthesia. Renal tubular acidosis (RTA) is due to inability of the renal tubules to maintain acid-base balance, causing a hyperchloraemia and a normal anion-gap. In type 1 (distal) RTA, there is hypokalaemic acidosis with low urinary ammonium production. Patients present with hyperventilation/acidosis and muscular weakness from hypokalaemia. In type 4 RTA (hyporeninaemic hypoaldosteronism), there is hyperkalaemic acidosis caused by chronic renal insufficiency from diabetes or tubulointerstitial disease.



[Q: 654] OnExamination - Endocrinology

A 15-year-old girl was admitted eight hours after taking an overdose of Diazepam 30mg and Methotrexate 400mg, which her mother had been prescribed for rheumatoid arthritis. On examination her Glasgow Coma Score was 10.

Which one of the following is the most appropriate immediate action?

- 1- Assess respiratory function
- 2- Perform immediate gastric lavage
- 3- Treat with activated charcoal
- 4- Treat with folic Acid
- 5- Urgent liver function tests

Answer & Comments

Answer: 1- Assess respiratory function

Her depressed GCS is due to the diazepam and the most appropriate initial treatment would be to assess her respiratory function prior to giving her folic acid.

Methotrexate overdose is extremely rare but potentially fatal with hepatotoxicity and renal toxicity reported. The most appropriate treatment is folic acid (Leucovorin). It is too late to consider gastric lavage or activated Charcoal.



[Q: 655] OnExamination - Endocrinology

A 54-year-old female presented with a neck swelling which has been more noticeable over the previous four months.

Examination revealed a moderate goitre and clinically she appeared euthyroid.

Investigations revealed:

T₄ 13.1 pmol/l (NR 9.8 - 23)
TSH 5.3 mU/l (NR 0.5 - 4 mU/l)

anti -microsomal antibodies positive

What is the most likely explanation of this patient's goitre?

- 1- Graves' disease
- 2- Hashimoto's thyroiditis
- 3- DeQuervain's thyroiditis
- 4- Multi-nodular goitre
- 5- Anaplastic thyroid carcinoma

Answer & Comments

Answer: 2- Hashimoto's thyroiditis

This patient has goitre with subclinical hypothyroidism, as reflected by elevated TSH but normal T4 and elevated microsomal antibodies. This suggests a diagnosis of Hashimoto's thyroiditis.



[Q: 656] OnExamination -
Endocrinology

A 48-year-old woman presents to her GP with Cushingoid facies and hyperpigmentation of the skin on her face and chest. She has smoked 20 cigarettes per year for 30 years. Examination reveals no gross abnormalities. Her chest X-ray reveals a 2 cm irregularly shaped mass in the right upper lobe, in proximity to the mediastinum. A CT guided needle biopsy of the lung lesion is performed.

Which would be the most likely cytologic finding?

- 1- Adenocarcinoma
- 2- Benign bronchial adenoma
- 3- Bronchoalveolar cell carcinoma (BAC)
- 4- Small cell (oat cell) carcinoma
- 5- Squamous cell carcinoma

Answer & Comments

Answer: 4- Small cell (oat cell) carcinoma

This patient has typical features of ectopic ACTH secretion which is usually due to a small cell lung cancer. Other less common causes of ectopic ACTH secretion include bronchial Carcinoids.



[Q: 657] OnExamination -
Endocrinology

A 45-year-old woman presents to the clinic with a three month history of sweats and weight gain of 7kg. Her sweats tend to be worse in the morning and with exercise and

she often feels light headed. On examination she has a BMI of 30 kg/m² but no abnormality is noted. Urinalysis negative.

What is the likely diagnosis?

- 1- Acromegaly
- 2- Diabetes mellitus
- 3- Insulinoma
- 4- Pheochromocytoma
- 5- Primary ovarian failure

Answer & Comments

Answer: 3- Insulinoma

This patient has sweats and weight gain exacerbated by exercise or fasting (a.m.) and associated with lightheadedness. This information suggests the presence of an insulinoma. Pheochromocytoma is unlikely as there is typically weight loss and there is no mention of hypertension. Acromegaly - features should be described. Diabetes Mellitus per se, possibly urinalysis would be expected to show glycosuria.

Presenting features of insulinoma include double vision, tachycardia / palpitations, "weakness", confusion, memory loss, seizures, sweating, hunger and weight gain.



[Q: 658] OnExamination -
Endocrinology

Following factors decrease large intestinal motility:

- 1- Parasympathetic activity
- 2- Anticholinergic agents
- 3- Gastric Distension
- 4- CCK-PZ
- 5- Laxatives.

Answer & Comments

Answer: 2- Anticholinergic agents

The others and cholinergic agents increase large intestinal motility.



[Q: 659] OnExamination - Endocrinology

A 47-year-old male presents with marked shortness of breath which has deteriorated over the last two weeks. On examination he has a hard, irregular thyroid mass and has some difficulty breathing. There appears to be no retrosternal extension and he appears clinically euthyroid.

What is the most likely diagnosis?

- 1- Anaplastic carcinoma of thyroid
- 2- Bleed into a thyroid nodule
- 3- Follicular thyroid carcinoma
- 4- Medullary thyroid carcinoma
- 5- Multinodular goitre

Answer & Comments

Answer: 1- Anaplastic carcinoma of thyroid

This patient is likely to have anaplastic carcinoma of the thyroid with compression/infiltration of the trachea. This is unlikely to be a multinodular goitre as this would be unlikely to compress the trachea unless retrosternal and the description is more compatible with a thyroid malignancy. Medullary thyroid cancer is associated most often with MEN II and would be particularly unusual. Again follicular would be unlikely to produce such marked infiltrative features in such a short period of time. Typically patients with follicular disease would present with a nodule and/or LAP.



[Q: 660] OnExamination - Endocrinology

An 80 year-old woman with type 2 diabetes mellitus is referred with weakness. She had been taking bendroflumethiazide, digoxin and tolbutamide. On examination she had a

temperature of 37.8C, a pulse of 98 bpm in atrial fibrillation, and a blood pressure of 118/72 mmHg.

Investigations show:

Sodium	121 mmol/L (137 - 144)
Potassium	3.3 mmol/L (3.5 - 4.9)
Urea	4.8 mmol/L (2.5-7.5)
Creatinine	83 micromol/L (60 - 110)
Glucose	15.2 mmol/L (3.0 - 6.0)
chest X-ray	normal

What is the most likely cause for the hyponatraemia?

- 1- Addison's disease
- 2- bendroflumethiazide (bendroflumethiazide)
- 3- hyperglycaemia
- 4- syndrome of inappropriate secretion of antidiuretic hormone
- 5- tolbutamide

Answer & Comments

Answer: 2- bendroflumethiazide (bendroflumethiazide)

This patient has hyponatraemia and hypokalaemia. This is probably due to the bendroflumethiazide which should be stopped. It is unlikely to be SIADH, of which tolbutamide is a cause, as the hypokalaemia is not typically associated.

Her hyperglycaemia with an osmotic diuresis would cause dehydration. Addison's disease would be associated with hyperkalaemia, hypotension and elevated urea.



[Q: 661] OnExamination - Endocrinology

A 45-year-old male presents with sweats and change in appearance. A diagnosis of acromegaly is confirmed with failure to suppress GH concentrations on an oral glucose

tolerance test. MRI reveals a 0.5 cm microadenoma of the pituitary.

Which of the following is the most appropriate therapeutic option for this patient?

- 1- Dopamine agonist therapy
- 2- Depot somatostatin analogue
- 3- Pituitary surgery
- 4- Short acting somatostatin analogue
- 5- Stereotactic pituitary irradiation

Answer & Comments

Answer: 3- Pituitary surgery

Surgery is the most appropriate primary therapy for acromegaly with a cure rate of above 80% expected for a tumours of this size. Although somatostatin analogues are very effective at suppressing GH concentrations to what would be regarded as a 'cure' range (GH less than 5 $\mu\text{U/L}$ on day profile) their expense limits use on the longer term basis. However, in patients unsuitable for surgery or in those not cured following surgery SMS would be employed.



[Q: 662] OnExamination - Endocrinology

In active acromegaly with associated diabetes mellitus which of the following findings would be expected?

- 1- Diabetes mellitus is due to an auto-immune process
- 2- Growth hormone concentrations are suppressed with hyperglycaemia
- 3- IGF-1 concentrations are low
- 4- There is insulin resistance
- 5- Treatment with a somatostatin analogue is contra-indicated

Answer & Comments

Answer: 4- There is insulin resistance

Insulin resistance stems from the excessive growth hormone concentrations (anti-insulin effects) that of course fail to suppress with hyperglycaemia. Acromegaly is often effectively treated with somatostatin analogues which may improve glycaemic control. Many of the effects of GH are mediated through IGF-1 whose concentrations are high in acromegaly. Diabetes mellitus is due to the insulin resistance and is not due to auto-immune insulinitis.



[Q: 663] OnExamination - Endocrinology

A 60-year-old female was prescribed thyroxine 150 μg daily for hypothyroidism. She was clinically hypothyroid and no goitre was present.

Investigations revealed:

serum total T_4 68 nmol/L (NR 55-145)

serum total T_3 0.5 nmol/L (NR 0.9-2.5)

serum TSH 70 mU/L (NR 0.5-4)

Which of the following would be the next step in her management?

- 1- Investigation for TSH secreting pituitary tumour
- 2- Measurement of free thyroxine concentration
- 3- Questioning of the patient about compliance
- 4- She has sick euthyroid syndrome, no further investigation required
- 5- Thyroid ultrasound scan

Answer & Comments

Answer: 3- Questioning of the patient about compliance

No one measures total Thyroid hormone levels any more except the RCP. Pathetic! This patient has a raised TSH but normal total thyroxine and a low T_3 . Either there is a block on the conversion of T_4 to T_3 or as seems

more likely the patient has just taken the T4 prior to coming to clinic. The explanation is non-compliance.



[Q: 664] OnExamination - Endocrinology

A 16-year-old female weighing 80kg presents with a six month history of excessive weight gain and weakness. On examination she had central obesity with abdominal striae, a blood pressure of 178/96 mmHg and proximal muscle weakness. Urinalysis showed glucose ++.

What is the most appropriate initial investigation for this patient?

- 1- 9am plasma cortisol concentration
- 2- 24 hour urinary free cortisol concentration
- 3- ACTH concentration
- 4- a 1mg overnight dexamethasone suppression test
- 5- a short synacthen test

Answer & Comments

Answer: 2- 24 hour urinary free cortisol concentration

This patient is likely to have Cushing's syndrome. It's a difficult choice between overnight dexamethasone suppression test and the urine free cortisol estimation but on balance, the simplest test would be Urine free cortisol assessment. In the dexamethasone suppression test 25-30 micrograms/kg is used (max 2mg), so the amount suggested in this question is too small. 9am cortisol and ACTH concentrations will not confirm the diagnosis. A short synacthen test is used to confirm hypoadrenalism.



[Q: 665] OnExamination - Endocrinology

A 30 year-old female presents with a one year history of galactorrhoea. She has been

receiving treatment for hay fever, depression, obesity and dyspepsia. Her investigations reveal:

Full Blood Count	normal
Urea and electrolytes	normal
Prolactin	820 mU/L (< 360)
free thyroxine (T ₄)	18.3 pmol/L (10-22)
TSH concentration	2.1 mU/L (0.4 - 5)

Which one of the following drugs is most likely to explain these findings?

- 1- Astemizole
- 2- Metoclopramide
- 3- Paroxetine
- 4- Ranitidine
- 5- Sibutramine

Answer & Comments

Answer: 2- Metoclopramide

Although the SSRIs are also rarely associated with hyperprolactinaemia, the answer has to be Metoclopramide which is a dopamine antagonist that is typically associated with hyperprolactinaemia.



[Q: 666] OnExamination - Endocrinology

A 45-year-old female attends clinic complaining of tiredness. She is hypothyroid and takes thyroxine 150 micrograms daily.

Which of the following is the most useful test for assessing the appropriateness of thyroid hormone replacement in primary hypothyroidism?

- 1- Free T3 and T4 concentrations
- 2- Skin biopsy
- 3- Thyroid binding globulin
- 4- Total T3 and T4
- 5- TSH

Answer & Comments

Answer: 5- TSH

TSH has been recognized as an exquisitely sensitive indicator of thyroid status. A normal TSH result suggests adequate thyroid hormone replacement and euthyroidism. Similarly elevated TSH with normal thyroid hormone concentrations would suggest poor compliance and suppressed TSH with normal - high T4 suggests over-replacement.



[Q: 667] OnExamination - Endocrinology

Which one of the following types of thyroid cancer in a 45-year-old woman has the worst prognosis following optimal treatment?

- 1- Papillary cancer with cervical lymph node metastases
- 2- Follicular cancer with bone metastases
- 3- Anaplastic cancer in a long standing goitre
- 4- Medullary cancer as part of the MEN type II syndrome
- 5- Thyroid lymphoma

Answer & Comments

Answer: 3- Anaplastic cancer in a long standing goitre

Anaplastic carcinoma usually occurs in middle-aged and older patients with longstanding goitre. The gland may suddenly increase in size producing pressure symptoms, dysphagia or vocal cord paralysis. The tumour is resistant to therapy. Death from massive local extension usually occurs within 3-36 months. Thyroid Medullary carcinoma is the next most aggressive, especially so in MEN 2B subjects, but less so in 2A subjects. Lymphoma may respond dramatically to irradiation.



[Q: 668] OnExamination - Endocrinology

A 16-year-old female patient is referred with

primary amenorrhoea. Investigations reveal a 46 XY karyotype.

Which of the following concerning the condition is true?

- 1- A diagnosis of Turner's syndrome is likely
- 2- It is likely that her mother received Carbimazole for thyrotoxicosis during pregnancy
- 3- Low testosterone and oestradiol concentrations would be expected
- 4- The diagnosis is likely to be testicular feminisation syndrome
- 5- The diagnosis is Noonan's syndrome

Answer & Comments

Answer: 4- The diagnosis is likely to be testicular feminisation syndrome

A female phenotype can occur in testicular feminisation, a condition associated with androgen insensitivity due to an androgen receptor defect. Stilboestrel therapy has been associated with the induction of latent tumours and to influence sexual behaviour but is not associated with abnormalities of sexual identity. In Noonan's syndrome, infants are males but physical features resemble that found in Turner's syndrome. Neither prednisolone nor maternal thyrotoxicosis would cause gender mal-assignment problems.



[Q: 669] OnExamination - Endocrinology

A 60-year-old female presents with recent-onset dyspnoea and noisy breathing. Her chest X-ray showed right deviation of the trachea due to a retrosternal goitre.

Which of the following tests is most useful in the assessment of airflow obstruction due to the goitre?

- 1- flow volume curve

- 2- forced expiratory flow volume in one second
- 3- forced vital capacity
- 4- peak expiratory flow rate
- 5- residual volume

Answer & Comments

Answer: 1- flow volume curve

Inspection of the maximal expiratory and inspiratory flow-volume curve is currently the simplest method to establish the presence of upper airway obstruction associated with a retrosternal goitre. This may be present in up to 40% of patients with retrosternal goitre and generally requires at least 50% obstruction of the airway before symptoms arise.



[Q: 670] OnExamination - Endocrinology

An 16-year-old man presents with polyuria and polydipsia.

Which of the following may confirm the diagnosis of diabetes mellitus?

- 1- A random plasma glucose of >7.5 mmol/L
- 2- A finding of 3+ ketonuria
- 3- An HbA1c of 7.0%
- 4- A fasting plasma glucose of 7.5 mmol/L
- 5- A plasma glucose of 10.2 mmol/l 2 hours after 75 grams of oral glucose.

Answer & Comments

Answer: 4- A fasting plasma glucose of 7.5 mmol/L

The diagnosis is usually relatively easy to confirm in a symptomatic subject. A random glucose of >11.1 mmol/L or a fasting glucose of >7.0 mmol/L would be regarded as confirmatory. There is usually glycosuria in addition to ketonuria. Isolated ketonuria suggests fasting. A raised glycosolated haemoglobin (HbA1c) is also highly suggestive

but not diagnostic. A glucose tolerance test is rarely needed.



[Q: 671] OnExamination - Endocrinology

A 32-year-old female is being investigated for tinnitus by the ENT department and undergoes an MRI scan. The scan is normal except for a pituitary tumour of 0.9cm confined to the pituitary fossa. Thyroid function tests, prolactin, LH, FSH and estradiol concentrations are all normal.

Which of the following would be the most appropriate management approach for this patient?

- 1- Pituitary biopsy
- 2- Reassure and continued observation
- 3- Transphenoidal hypophysectomy
- 4- Treat with dopamine agonist therapy
- 5- Stereotactic pituitary irradiation

Answer & Comments

Answer: 2- Reassure and continued observation

This patient has a co-incidentally noted pituitary tumour, has no endocrine symptoms and appears to have normal endocrine function although we are not provided with information pertaining to cortisol secretory function nor GH. With this caveat in mind, the most appropriate strategy would be observation and repeat scanning.



[Q: 672] OnExamination - Endocrinology

A 53-year-old male is suspected of having acromegaly.

Which of the following is the best investigation to confirm the diagnosis?

- 1- 9am growth hormone concentrations

- 2- An insulin tolerance test with growth hormone concentrations
- 3- Glucose tolerance test with growth hormone concentrations
- 4- Growth hormone releasing hormone test
- 5- insulin-like growth factor-1 (IGF-1)

Answer & Comments

Answer: 3- Glucose tolerance test with growth hormone concentrations

The diagnosis of Acromegaly is confirmed by inadequate suppression of GH concentrations below 2 mU/l in an oral glucose tolerance test. Although IGF-1 concentrations are elevated these are not diagnostic and may fall during illness.



[Q: 673] OnExamination - Endocrinology

Which of the following is associated with Congenital Adrenal Hyperplasia?

- 1- Delayed puberty
- 2- Hypopigmentation
- 3- Hyporeninaemia
- 4- Persistent Wolffian duct
- 5- Premature epiphyseal closure

Answer & Comments

Answer: 5- Premature epiphyseal closure

Premature epiphyseal closure is a classical feature of CAH, and is secondary to high levels of sex steroids. Under, and over treatment of CAH patients puts patients at risk of short stature, over treatment because of the glucocorticoid induced inhibition of the growth axis. CAH is associated with precocious puberty caused by long term exposure to androgens, which activate the hypothalamic-pituitary-gonadal axis.

Similarly, CAH is associated with hyperpigmentation, and hyperreninaemia due

to sodium loss and hypovolaemia. The Wolffian duct is never formed in CAH.



[Q: 674] OnExamination - Endocrinology

A 16-year-old girl is noted to have persistent polyuria in excess of 4 litres per day whilst recovering from a head injury she sustained in a road traffic accident. Investigations reveal:

potassium 4.1 mmol/L (3.5-4.9)
calcium 2.4 mmol/L (2.2-2.6)
glucose 5.6 mmol/L (3.0-6.0)

Which one of the following is the most effective method of confirming the diagnosis?

- 1- autoantibodies to vasopressin neurones
- 2- MRI of the hypothalamus and pituitary
- 3- therapeutic trial of low dose DDAVP
- 4- vasopressin concentration
- 5- water deprivation test

Answer & Comments

Answer: 5- water deprivation test

The history and confirmed polyuria are suspicious of diabetes insipidus which is not uncommon after head injury. This can be confirmed with a water deprivation test where failure of urine concentration would be expected. A MRI of the pituitary and hypothalamus may show no abnormality but would be undertaken after the diagnosis of DI is confirmed. Similarly anterior hormone assessment would also be undertaken after the diagnosis is confirmed. A therapeutic trial of DDAVP is only appropriate if the diagnosis of DI is confirmed as primary polydipsia can also be a feature of trauma and in these circumstances DDAVP may precipitate hyponatraemia. Autoantibodies to ADH neurones are irrelevant.



[Q: 675] OnExamination -
Endocrinology

A 45-year-old woman presents with a 1 year history of weight gain and intermittent sweating.

What is the most likely diagnosis?

- 1- Carcinoid syndrome
- 2- Hypothyroidism
- 3- Insulinoma
- 4- Lymphoma
- 5- Pheochromocytoma

Answer & Comments

Answer: 3- Insulinoma

The clinical scenario is classic of insulinoma. Weight gain is the key differentiating feature here - sweating being more commonly shared with the other conditions except hypothyroidism. There is nothing else offered, other than insulinoma, that explain both symptoms in this middle aged woman.

As primary ovarian failure is not offered which would seem the most probable answer then the features would otherwise suggest an insulinoma which is commoner in females and unlike carcinoid and lymphoma is associated with weight gain rather than weight loss. Pheochromocytoma is associated with bouts of sweating but not weight gain - there is also no mention of other typical features such as palpitations and hypertension.



[Q: 676] OnExamination -
Endocrinology

A 17-year-old boy has learning difficulties and is seen in the genetics clinic as his maternal uncles also had learning difficulties. Examination reveals that the patient has large ears and large testes.

What is the most likely genetic diagnosis?

- 1- 47 XYY

- 2- Acromegaly
- 3- Fragile X syndrome
- 4- Klinefelter's syndrome
- 5- Mosaic Down's syndrome

Answer & Comments

Answer: 3- Fragile X syndrome

In addition to moderate to severe mental retardation, other characteristics of individuals with Fragile X syndrome may include large ears, macroorchidism, prognathism, speech delays, prominent forehead, double-jointedness, autistic symptoms and occasional self-mutilation. The face is typically long and narrow, with a high arched palate and large ears.

Otitis media, strabismus, and dental problems may be present. Other common characteristics include hyperextensible joints, hypotonia, and heart problems including mitral valve prolapse.

In males, abnormally large testes are a distinctive feature. In young children, delayed motor development, hyperactivity, behavioural problems, toe walking, and occasional seizures can occur.



[Q: 677] OnExamination -
Endocrinology

A 30-year-old man had a blood pressure of 150/100 mmHg. Clinical examination was normal.

Which one of the following would suggest secondary hypertension?

- 1- 24 hour urinary protein excretion of 1.6g (<0.2)
- 2- A Creatinine clearance of 90 mL/min (70-140)
- 3- Left ventricular hypertrophy criteria on the ECG

- 4- The presence of arteriovenous nipping on fundoscopy.
- 5- Serum potassium of 3.9 mmol/L (3.5-4.9)

Answer & Comments

Answer: 1- 24 hour urinary protein excretion of 1.6g (<0.2)

It is rather young for a 30-year-old to be hypertensive but the presence of such a nephrotic range of urine protein would suggest renal origin ?Polyarteritis nodosa etc. The potassium concentration is normal and although it does not exclude Conn's it is certainly not suggestive. LVH would be found with sustained hypertension of any aetiology as would av nipping. The creatinine clearance is normal.



[Q: 678] OnExamination - Endocrinology

In the treatment of Congenital Adrenal Hyperplasia, which of the following statements is correct?

- 1- Hydrocortisone may be administered once daily
- 2- Preferred treatment in children is prednisone
- 3- Efficacy of treatment is best monitored by 17-OH progesterone and androstenedione levels
- 4- Renin activity levels are of no clinical use in treatment monitoring
- 5- Hypotension, hyperkalaemia and hyperreninaemia suggest that the dose of mineralocorticoid should be reduced

Answer & Comments

Answer: 3- Efficacy of treatment is best monitored by 17-OH progesterone and androstenedione levels

In the treatment of CAH the lowest dose of glucocorticoid that suppresses(not totally)

Adrenal androgens, whilst maintaining normal growth and weight gain is the optimum dose of glucocorticoid replacement.

Renin activity levels can be used to monitor adequacy of mineralocorticoid and sodium replacement. Hydrocortisone has a relatively short half-life and must therefore be administered twice daily, whilst the preferred mode of glucocorticoid replacement in children is hydrocortisone as it minimises growth suppression.

Over treatment with mineralocorticoids leads to hypertension, suppressed plasma rennin activity and possibly growth retardation.



[Q: 679] OnExamination - Endocrinology

A 17-year-old girl complains of feeling tired and lethargic for the last 6 months. She also has generalized abdominal discomfort and constipation. She denies depression but her performance at school has deteriorated this year. Examination shows a pale and thin young woman. Her blood pressure is 110/60 mmHg.

Hb 13.4 g/l
 WBC 4.8×10^9
 Platelet 290×10^9
 ESR 37mm/hr
 Na 131mM (135-144)
 K 2.7mM (3.4-4.5)
 Urea 3.0mM (3-7)
 Creat 90mM (50 - 100)
 Bicarbonate 35mM (20-28)
 Alkaline phosphatase 90iu/l (50-110)
 Bilirubin 12 (0-17)
 AST 30 iu/l (5-40)
 Albumin 36 g/l (33-44)
 CXR normal

Which of the following is the most likely underlying diagnosis?

- 1- Cushings syndrome
- 2- Conns syndrome
- 3- Addisons disease
- 4- Anorexia nervosa
- 5- Pheochromocytoma

Answer & Comments

Answer: 4- Anorexia nervosa

This patient has anorexia nervosa with self-induced vomiting, which would explain the low Na, K and alkalosis. Addisons disease causes hyponatraemia and hyperkalaemic acidosis, whilst Cushings disease cause hypokalaemic alkalosis. The clinical presentation does not fit with the latter. Conn's syndrome (adrenal adenoma) is associated with hypertension and hypokalaemia.



[Q: 680] OnExamination - Endocrinology

A 79-year-old female suffers a fracture neck of femur following a fall at home. Investigations are normal but her X-ray shows the bones to be rather 'thin'. It is assumed that she is osteoporotic and she is started on alendronate therapy.

Which of the following is correct concerning this drug.

- 1- Enhances vitamin D action on bone
- 2- Increases absorption of calcium
- 3- Increases osteoblast activity
- 4- Increases the action of oestrogen on bone
- 5- Inhibits osteoclast activity

Answer & Comments

Answer: 5- Inhibits osteoclast activity

The bisphosphonates of which alendronate is one, increase Bone mineralisation by inhibiting osteoclastic activity. They have been demonstrated in numerous studies to reduce subsequent risk of fracture.



[Q: 681] OnExamination - Endocrinology

A 39-year-old female presents with polyuria and is passing 4 litres of urine per day. She was recently started on a new medication

Serum sodium 144 mmol/l

Plasma osmolality 299 mosmol/l (275-290)

Urine osmolality 210 mosmol/l (350-1000)

Which of the following drugs was prescribed?

- 1- Aspirin
- 2- Fluoxetine
- 3- Glibenclamide
- 4- Lithium
- 5- Metoprolol

Answer & Comments

Answer: 4- Lithium

This lady has eunatraemia, hypertonicity (high serum osmolality) and inappropriately dilute urine) which is consistent with Diabetes insipidus. Of the drugs listed Lithium would be the most likely to cause a nephrogenic DI.



[Q: 682] OnExamination - Endocrinology

A 32-year-old woman with known hypothyroidism is admitted to hospital. Her Blood pressure is 86/53 mmHg and her pulse 100 bpm. Investigations reveal:

Serum sodium 126 mmol/l (133-145)

Serum potassium 5.8 mmol/l (3.5-5.0)

Serum glucose 3.0 mmol/l (3.5-6.0)

What is the most appropriate investigation?

- 1- Anti-thyroglobulin antibody

- 2- Plasma insulin concentration
- 3- Random serum cortisol concentration
- 4- Short synacthen test
- 5- Urine and plasma osmolality

Answer & Comments

Answer: 4- Short synacthen test

This young woman probably has an autoimmune hypothyroidism and now presents with features typical of acute hypoadrenalism. The biochemistry is also supportive with low sodium, low glucose and elevated potassium. The diagnosis may be confirmed with inadequate cortisol response in the short synacthen test. A random cortisol concentration is not adequate to diagnose hypoadrenalism.



[Q: 683] OnExamination - Endocrinology

An 18-year-old male presented with delayed pubertal development. He had always noted an impaired sense of smell. Examination revealed that his height was on 90th centile and his weight on the 90th centile. His external genitalia showed a small penis with testicular volumes of 3 mL bilaterally and no pubic hair. Investigations revealed: LH concentration 1.0 U/L (1-10), FSH concentration 1.0 U/L (1-7), Serum testosterone 3.0 pmol/L (9-35), Free T₄ 19 pmol/L (10-22), TSH 3.0 mU/L (0.4-5), CT scan reported as normal.

What is the most likely diagnosis?

- 1- Constitutional delay of puberty
- 2- Kallmann's syndrome.
- 3- Klinefelter's syndrome.
- 4- Noonan's syndrome.
- 5- Prader-Willi syndrome.

Answer & Comments

Answer: 2- Kallmann's syndrome.

The combination of hypogonadotrophic hypogonadism and anosmia would suggest a diagnosis of Kallmann's syndrome. This is one of the commonest causes of isolated hypogonadotrophic hypogonadism and is due to a failure of migration of the olfactory neurones and GnRh neurones during development.



[Q: 684] OnExamination - Endocrinology

Which of the following statements is true of Type 2 Diabetes Mellitus?

- 1- 20% of patients develop macrovascular complications within 10 years of diagnosis
- 2- Drug treatment is associated with a 25% reduction in microvascular complications compared with diet alone.
- 3- A single fasting plasma glucose above 8 mmol/L is diagnostic of diabetes.
- 4- Type 2 diabetes is associated with being underweight
- 5- Metformin is the preferable treatment in the obese patient with type 2 diabetes

Answer & Comments

Answer: 5- Metformin is the preferable treatment in the obese patient with type 2 diabetes



[Q: 685] OnExamination - Endocrinology

Which of the following doses of prednisolone is equivalent in its glucocorticoid potency to 20mg of hydrocortisone.

- 1- 2 mg
- 2- 5 mg
- 3- 10 mg
- 4- 15 mg

5- 20 mg

Answer & Comments

Answer: 2- 5 mg

It is important to know the relative potencies of the glucocorticoids. Dexamethasone for instance is roughly 30 times more potent than hydrocortisone.



[Q: 686] OnExamination - Endocrinology

An elderly asthmatic lady on treatment with high dose prednisolone, complains of a 4 week history of right hip pain. She comments that recently she seems to be developing more facial hair and adds that she has also been diagnosed with high blood pressure and diabetes. On examination she is noted to be unable to weight bear on the right side.

What is the most likely cause of her hip pain?

- 1- Avascular necrosis of femoral head
- 2- Dislocation of the hip joint
- 3- Fracture neck of femur
- 4- Gout
- 5- Osteoarthritis of the hip joint

Answer & Comments

Answer: 1- Avascular necrosis of femoral head

This question simply tests the knowledge of side-effects of corticosteroids (a favourite theme in MRCP 1). The patient has features of hypercortisolism. Obviously, avascular necrosis of femoral head is the cause of her right hip pain.



[Q: 687] OnExamination - Endocrinology

A 35-year-old male presents with weakness and tiredness. He is noted to be hypertensive. Electrolytes show a hypokalaemia and a hypomagnesaemia.

What investigation would you select for this patient?

- 1- Colonoscopy
- 2- Plasma renin toaldosterone ratio
- 3- Serum amylase
- 4- Serum calcium
- 5- Oral glucose tolerance test

Answer & Comments

Answer: 2- Plasma renin toaldosterone ratio

The hypokalaemic hypertension with hypomagnesaemia suggests primary hyperaldosteronism. The most reliable assessment for this would be renin to aldosterone ratio.



[Q: 688] OnExamination - Endocrinology

Testosterone

- 1- Is a steroid hormone
- 2- Acts via cell surface receptors
- 3- Acts via g-protein second messengers
- 4- Is manufactured through the breakdown of oestradiol
- 5- In the circulation is mostly bound to albumin

Answer & Comments

Answer: 1- Is a steroid hormone

Testosterone is a steroid hormone receptor and can be converted to oestradiol. It binds to intra-cellular receptors and is mostly bound to sex-hormone binding globulin.



[Q: 689] OnExamination - Endocrinology

A 42-year-old man being investigated for diabetes and impotence is noted to have the following results:

Alanine aminotransferase 30 U/L (5-35)
 Aspartate aminotransferase 22 U/L (1-31)
 Fasting plasma glucose 7.4 mmol/L (3.0-6.0)
 Ferritin 500 ug/L (15-300)

Which one of the following would be the next most appropriate investigation?

- 1- bone marrow smear and iron stain
- 2- liver biopsy
- 3- Red cell protoporphyrins
- 4- serum transferrin receptors
- 5- transferrin saturation

Answer & Comments

Answer: 5- transferrin saturation

This patient has a suspected diagnosis of haemochromatosis as suggested by the presentation and laboratory investigations including elevated ferritin. The next investigation would be measurement of transferrin saturation and then if elevated (above 45%) genotyping (Homozygosity for C282Y mutations) would next be considered and would be expected to clinch the diagnosis. In the event of rarer mutations confirmation with liver biopsy may be required.



[Q: 690] OnExamination - Endocrinology

A diagnosis of diabetes mellitus is being considered in 32-year-old woman who is 16 weeks pregnant. Her body mass index (BMI) was 22 kg/m² (18 - 25). A 75g oral glucose tolerance test revealed:

Time	Plasma glucose concentration
0 hr	6.0 mmol/l (3.0-6.0)
2hr	12.5 mmol/l (<11.1)

Which of the following is the most appropriate step in the management of this patient?

- 1- Low calorie diet
- 2- Glipizide therapy

3- Metformin therapy

4- Repeat her oral glucose tolerance test in four weeks

5- Insulin therapy

Answer & Comments

Answer: 5- Insulin therapy

The result confirms a diagnosis of gestational diabetes mellitus with the 2hr OGTT result above 11.1 mmol/l. To minimise the fetal consequences of GDM (macrosomia, fetal malformations, still birth, IUGR etc), the patient's glycaemia should be strictly controlled with insulin. A low calorie diet is inappropriate and neither metformin nor glipizide are licenced for use in pregnancy. There is no point in repeating the OGTT in 4 weeks as control is required NOW.



[Q: 691] OnExamination - Endocrinology

A 64-year-old female is diagnosed with osteoporosis and is receiving treatment with Raloxifene.

What is raloxifene?

- 1- A synthetic oestrogen
- 2- A bisphosphonate
- 3- An androgenic steroid
- 4- A selective androgen receptor modulator (SARM)
- 5- A selective oestrogen receptor modulator (SERM)

Answer & Comments

Answer: 5- A selective oestrogen receptor modulator (SERM)

Raloxifene, like tamoxifen is a SERM, with oestrogen like activity at sites like bone but anti-oestrogen like effects on breast/endometrium.



[Q: 692] OnExamination -
Endocrinology

Side effects of recombinant human growth hormone therapy include:

- 1- Proliferative retinopathy
- 2- Aplastic anaemia
- 3- Leukaemia
- 4- Creutzfeldt-Jacob disease
- 5- Benign Intracranial hypertension

Answer & Comments

Answer: 5- Benign Intracranial hypertension

Unlike the old pituitary derived GH, rhGH is not associated with CJD as it is manufactured by recombinant techniques. rhGH therapy has been associated with BIH probably due to the fluid retention associated with GH therapy.



[Q: 693] OnExamination -
Endocrinology

Non-alcoholic steatohepatitis is associated with which of the following?

- 1- A benign course in all cases
- 2- Alcohol abuse
- 3- Insulin resistance
- 4- Normal level of liver enzymes
- 5- Viral hepatitis

Answer & Comments

Answer: 3- Insulin resistance

Non-alcoholic steatohepatitis (NASH) is associated with insulin resistance, hyperlipidaemia and chronic moderately elevated liver enzymes. The diagnosis is made only by histology of liver biopsy which shows lesions suggestive of ethanol intake in a patient known to consume less than 40g of alcohol per week. It is not necessarily benign: cryptogenic cirrhosis in patients is a

substantial number of probably end-stage NASH.



[Q: 694] OnExamination -
Endocrinology

A 70-year-old female who is receiving amiodarone for paroxysmal atrial fibrillation presents with tiredness and weight loss.

Investigations reveal:

C-reactive protein 6 mg/L (<10)

free Thyroxine 38 pmol/L (10-22)

TSH <0.05 mU/L (0.5-4.5)

Which is the most appropriate treatment for this patient?

- 1- Carbimazole
- 2- Lithium therapy
- 3- Prednisolone
- 4- Radioiodine therapy
- 5- thyroidectomy

Answer & Comments

Answer: 1- Carbimazole

The most appropriate initial treatment of this amiodarone induced hyperthyroidism would be carbimazole. Despite stopping the amiodarone thyrotoxicosis may persist for many months and so additional treatment is often required. Two types of amiodarone induced hyperthyroidism are recognised. The first being a consequence of iodine overload contained within the amiodarone of which the above is a typical example and the second type is due to an acute thyroiditis with thyroid cell destruction and increased parameters of inflammation. The former is best treated with carbimazole, the latter with prednisolone.



[Q: 695] OnExamination -
Endocrinology

Which of the following best describes the mode of action of alendronate?

- 1- inhibits osteoclast activity
- 2- promotes bone matrix calcification
- 3- promotes collagen synthesis
- 4- promotes renal absorption of calcium
- 5- stimulates osteoblast activity

Answer & Comments

Answer: 1- inhibits osteoclast activity

Simple bisphosphonates such as clodronate and etidronate inhibit bone resorption through induction of osteoclast apoptosis. Clodronate, and perhaps etidronate, triggers apoptosis by generating a toxic analog of adenosine triphosphate, which then targets the mitochondria. For nitrogen-containing bisphosphonates, the direct intracellular target is the enzyme farnesyl diphosphate synthase in the cholesterol biosynthetic pathway. Its inhibition suppresses a process called protein geranylgeranylation, which is essential for the basic cellular processes required for osteoclastic bone resorption. Although nitrogen-containing bisphosphonates can induce osteoclast apoptosis, this is not necessary for their inhibition of bone resorption.



[Q: 696] OnExamination - Endocrinology

A 32 year-old woman presents with a one year history of secondary amenorrhoea. She had been prescribed temazepam and dihydrocodeine. On examination she had galactorrhoea. Her serum prolactin was noted to be 6000 mU/l (<450 mU/l).

What is the most likely diagnosis?

- 1- Drug-induced hyperprolactinaemia
- 2- Hypothyroidism
- 3- Pituitary dependent Cushing's disease
- 4- Pituitary microadenoma
- 5- Stress

Answer & Comments

Answer: 4- Pituitary microadenoma

The patient has amenorrhoea, galactorrhoea and a grossly elevated prolactin concentration of 6000. The diagnosis is likely to be a prolactinoma most likely due to a pituitary microadenoma (microprolactinoma). These drugs would not cause hyperprolactinaemia ?drugs that are responsible include dopamine antagonists ?Antipsychotics (Haloperidol, Sulpiride), metoclopramide, Domperidone and SSRIs to a lesser extent. There is nothing in this patients history to suggest either hypothyroidism or Cushing's.

Hypothyroidism may cause hyperprolactinaemia but is usually mild. Stress would not produce such a picture.



[Q: 697] OnExamination - Endocrinology

A 62-year-old woman presents with stridor associated with a retro-sternal goitre.

What is the most appropriate investigation of her airways obstruction?

- 1- FEV₁/FVC ratio
- 2- Flow-volume loop
- 3- Peak Expiratory Flow Rate
- 4- Spirometry
- 5- Transfer factor

Answer & Comments

Answer: 2- Flow-volume loop

The flow volume loop is the best method of for detecting an obstruction associated with a retrosternal mass.



[Q: 698] OnExamination - Endocrinology

A 44-year-old man presents with new onset bilateral gynaecomastia. He has been diagnosed with Zollinger-Ellison syndrome in

the last year. He underwent normal puberty at age 14.

Which of the following is the most likely cause of this mans gynaecomastia?

- 1- Cimetidine
- 2- Famotidine
- 3- Lanzoprazole
- 4- Rabeprazole sodium
- 5- Ranitidine

Answer & Comments

Answer: 1- Cimetidine

The answer to this question is cimetidine which is an H2 receptor antagonist. Blockade of androgen-responsive receptors in the target organ appears to be the most likely mechanism involved. Research has shown that the other drugs listed above which may also be used as part of the treatment of Zollinger-Ellison syndrome have a much lower almost insignificant risk in the development of gynaecomastia.

Other drugs that can cause gynaecomastia include - spironolactone, digoxin, methyl dopa, gonadotrophins and cyproterone acetate.

Zollinger-Ellison syndrome

The association of peptic ulcer with a gastrin-secreting pancreatic adenoma - 50-60% are malignant. It occurs in approx 0.1% of patients with duodenal ulcer disease and is to be suspected in those with multiple peptic ulcers that are resistant to drugs.



[Q: 699] OnExamination - Endocrinology

A 26-year-old female presents with a six weeks history of galactorrhoea. She has no other symptoms but takes medication for contraception, dyspepsia and migraine. Examination reveals slight galactorrhoea with

expression from both breasts but is otherwise normal.

Investigations show:

" Prolactin 915 mU/L (< 450)

Which one of the following drugs may be responsible?

- 1- Codeine phosphate
- 2- Metoclopramide
- 3- Omeprazole
- 4- Oral contraceptive pill
- 5- Sumatriptan

Answer & Comments

Answer: 2- Metoclopramide

Metoclopramide acts as a dopamine antagonist. Dopamine inhibits the release of Prolactin from the anterior Pituitary gland. Therefore, metoclopramide can predispose to hyperprolactinaemia and consequent galactorrhoea.



[Q: 700] OnExamination - Endocrinology

A 36-year-old man attends clinic with his wife after failing to conceive after 10 years of marriage. Examination reveals that he is tall, thin and has bilateral gynaecomastia. Investigations show high levels of urinary gonadotrophins.

What is the most likely diagnosis?

- 1- Andropause
- 2- Gaucher's disease
- 3- Klinefelter's syndrome
- 4- Marfan syndrome
- 5- Noonan's syndrome

Answer & Comments

Answer: 3- Klinefelter's syndrome

Gaucher's and Marfan syndrome do not present with infertility. Noonan's is associated with short stature. Klinefelter's is a sex chromosome disorder affecting 1:400 - 1:600 male births typically with 47 XXY, XXXYY or XXYY. Andropause is the term for the gradual decrease in serum testosterone concentration with age, but does not occur, usually, until after the age of 50.



[Q: 701] OnExamination - Endocrinology

A 17-year-old female is referred with a six month history of amenorrhoea and weight loss, for which no organic cause can be found.

Which of the following features would support a diagnosis of anorexia nervosa?

- 1- Delusions of poisoning
- 2- Hypotrichosis
- 3- Hypergonadotrophic hypogonadism
- 4- Delusion of being overweight
- 5- Watery diarrhoea

Answer & Comments

Answer: 4- Delusion of being overweight

Features of AN include a phobic avoidance of normal weight, relentless dieting, self-induced vomiting, laxative use, excessive exercise, amenorrhoea, lanugo hair, hypotension, denial, concealment, overperception of body image, enmeshed families.



[Q: 702] OnExamination - Endocrinology

A 55-year-old obese man with Type 2 DM is uncontrolled on diet alone.

Which of the following oral hypoglycaemic therapies functions through improving insulin sensitivity

- 1- acarbose
- 2- glimepiride

- 3- glipizide
- 4- repaglinide
- 5- rosiglitazone

Answer & Comments

Answer: 5- rosiglitazone

Rosiglitazone, a PPAR gamma agonist is an insulin sensitiser. Its exact mechanism of action is not fully appreciated but it improves muscle glucose utilisation and also hepatic glucose uptake.



[Q: 703] OnExamination - Endocrinology

Which of the findings listed below is true of Acromegaly?

- 1- A random growth hormone concentration may be diagnostically useful.
- 2- It is unusual for the pituitary fossa to be enlarged.
- 3- Pituitary hormones other than growth hormone are rarely affected.
- 4- The majority of patients demonstrate an abnormal glucose tolerance test.
- 5- Growth hormone concentrations are suppressed to normal by bromocriptine therapy.

Answer & Comments

Answer: 4- The majority of patients demonstrate an abnormal glucose tolerance test.

Random GH concentrations are pretty useless in the diagnosis of acromegaly which depends upon non-suppression of GH in the Oral Glucose tolerance test in which approx 50% have either impaired GTT or diabetes. GH concentrations seldom suppress to normal with bromocriptine but often respond far better with Octreotide. C is awkward but prolactin is often elevated (30%) although

hypopituitarism would be unusual unless the tumour is particularly large. Usually at presentation the fossa is enlarged (about 80%).



[Q: 704] OnExamination - Endocrinology

An 18 year-old girl receives radioactive iodine as treatment of thyrotoxicosis.

Which of the following is the most likely long-term complication of this treatment?

- 1- hypoparathyroidism
- 2- hypothyroidism
- 3- increased risk of developing cancer
- 4- recurrent laryngeal nerve damage
- 5- osteoporosis

Answer & Comments

Answer: 2- hypothyroidism

RAI is safe and that is why it is given across all ages as a definitive treatment of thyrotoxicosis. The most likely side effect of radioactive iodine is hypothyroidism with approx 80% developing hypothyroidism after therapy. There is no evidence to suggest that RAI is associated with any cancers. However, RAI must not be given to pregnant females particularly after the 12th gestational week as it would be taken up by the developing foetal thyroid causing fetal hypothyroidism and is also considered to be teratogenic. Recurrent laryngeal nerve damage is a potential risk of thyroid surgery, not RAI.



[Q: 705] OnExamination - Endocrinology

In the treatment of osteoporosis, which of the following best describe the drug Raloxifene?

- 1- A Bisphosphonate
- 2- A Calcium Receptor Modulator
- 3- An Estrogen

4- A PTH receptor agonist

5- A Selective Estrogen Receptor Modulator

Answer & Comments

Answer: 5- A Selective Estrogen Receptor Modulator

Raloxifene is the first of the so-called Selective Estrogen Receptor Modulators. There are fundamentally two types of estrogen receptor, alpha and beta, distributed at locations such as breast, uterus, bone and in the vasculature. Raloxifene acts as an estrogen agonist at some sites eg Bone to increase mineralisation but acts as an antagonist at other sites eg uterus/breast (preventing endometrial/breast hyperplasia).



[Q: 706] OnExamination - Endocrinology

A 21-year-old male is referred to the endocrine clinic with poorly developed secondary sexual characteristics. The only relevant finding on history is that he has a very poor sense of smell. On examination he has no axillary or pubertal hair, a 3cm penis and testicular volumes of approximately 5mls bilaterally. Smell test reveals that he is unable to distinguish acetone and coffee.

Investigations reveal:

Testosterone 4 nmol/L (10-30)

Prolactin 380 mU/L (< 450)

FSH 2.1 iu/L (1-7)

LH 1.5 iu/L (1-10)

What is the most likely diagnosis?

- 1- 5-alpha reductase deficiency
- 2- Craniopharyngioma
- 3- Kallman's syndrome
- 4- Klinefelter's syndrome
- 5- Microdeletion of the Y chromosome

Answer & Comments

Answer: 3- Kallman's syndrome

This patient has evidence of hypogonadotrophic, hypogonadism with a low testosterone and a low FSH and LH. In this case, there is isolated gonadotrophic deficiency as evidence by a normal prolactin, this is seen in Kallman's syndrome, which is often associated with anosmia.

In Klinefelter's syndrome an elevated LH/FSH would be expected as this is due to testicular failure, as would be the case in 5-alpha reductase deficiency. Craniopharyngioma is a possibility as it does cause hypogonadotrophic hypogonadism but abnormalities in sense of smell would not be expected.



[Q: 707] OnExamination - Endocrinology

A 60-year-old man presents with inspiratory stridor with a Chest X-ray revealing compression of the trachea by a retrosternal goitre.

Which of the following investigations is the most useful to assess the severity of his airways obstruction?

- 1- flow/volume loop
- 2- forced expiratory volume
- 3- forced vital capacity
- 4- peak expiratory flow rate
- 5- residual volume

Answer & Comments

Answer: 1- flow/volume loop

A flow volume loop is the most appropriate investigation to assess severity of the obstruction.



[Q: 708] OnExamination - Endocrinology

In a study, healthy volunteers are given 50 mls

of 50% dextrose solution by one of two routes. Route A is intravenous and Route B is via a nasogastric tube. Every 15 minutes the plasma insulin level and glucose is measured and plotted on a graph.

Which of the following statements would best describe the likely results comparing Route A to Route B in this experiment?

- 1- insulin higher, glucose higher in Route A
- 2- insulin higher, glucose higher in Route B
- 3- insulin higher, glucose lower in Route A
- 4- insulin higher, glucose lower in Route B
- 5- insulin and glucose the same in Route A and Route B

Answer & Comments

Answer: 4- insulin higher, glucose lower in Route B

Glucose given via the gut elicits a greater insulin response as compared to the same quantity given intravenously even though the plasma glucose peak is higher when it is given IV. This phenomenon is called the 'incretin effect'.

The incretin effect denominates the phenomenon that oral glucose elicits a higher insulin response than does intravenous glucose. The two hormones responsible for the incretin effect, glucose-dependent insulinotropic hormone (GIP) and glucagon-like peptide-1 (GLP-1), are secreted after oral glucose loads and augment insulin secretion in response to hyperglycemia. Gastric Inhibitory Polypeptide and Glucagon-Like Peptide-1 in the Pathogenesis of Type 2 Diabetes. Diabetes 53:S190-S196, 2004

The investigation of the incretin effect is not usually performed using the same quantity of glucose as in this question. An 'isoglycaemic study' is often used where an infusion of glucose is designed to copy exactly the blood glucose profile generated in an individual or animal by a certain enteral glucose load.

Exenatide (synthetic exendin-4) is a new agent for the treatment of Type 2 Diabetes. Exendin-4 occurs naturally in the saliva venom of the North American lizard called the Gila Monster. It mimics the action of the gut hormone GLP-1 (Glucagon-like peptide 1).



[Q: 709] OnExamination - Endocrinology

A 62-year-old female with a six year history of type 2 diabetes attends for annual review. Her HbA1c is 10%.

Into what average plasma glucose concentration does her HbA1c translate?

- 1- 7.5 mmol/l
- 2- 10 mmol/l
- 3- 12.5 mmol/l
- 4- 15.5 mmol/l
- 5- 19 mmol/l

Answer & Comments

Answer: 4- 15.5 mmol/l

The HbA1c is an important reflection of control over a 3 month period (life expectancy of the erythrocyte). There is a good relationship between the rise in glucose and its ability to glycosylate the Hb molecule (there's a difference between average plasma glucose and blood glucose, if you are looking at the link provided it should be obvious). Thus a HbA1c of 7% would translate into an average PLASMA (higher than value of BLOOD glucose) glucose of 9.5 mmol/l and a HbA1c of 10% into 15.5 mmol/l. This is the reason why so much emphasis is placed on controlling HbA1c rather than the specific glucose measurements as these vary so much throughout the day.



[Q: 710] OnExamination - Endocrinology

A type 1 diabetic displays typical symptoms of

hypoglycaemic unawareness.

Which of the following statements regarding hypoglycaemic unawareness is correct?

- 1- Glucose sensing occurs in the locus caeruleus
- 2- Recurrent hypoglycaemia is most commonly associated with poor diabetic control
- 3- Recurrent hypoglycaemia has no long term consequences on higher cerebral function
- 4- D Selective beta-blockers are an important cause of hypoglycaemia unawareness
- 5- Alcohol inhibits gluconeogenesis in patients with hypoglycaemia unawareness

Answer & Comments

Answer: 5- Alcohol inhibits gluconeogenesis in patients with hypoglycaemia unawareness

Alcohol inhibits gluconeogenesis, decreases peripheral hypoglycaemic responses and impairs perception of symptoms of hypoglycaemia. There is no evidence to suggest that beta-blockers cause hypoglycaemia unawareness. Glucose sensing occurs in the hypothalamus, and there is evidence to suggest that chronic, and recurrent hypoglycaemia may have deleterious effects on higher cerebral function.



[Q: 711] OnExamination - Endocrinology

A 26-year-old female with no previous history of diabetes presents with a first episode of diabetic ketoacidosis. There is no evidence of infection but she has recently commenced a new medication.

Which of the following drugs is implicated in precipitating diabetic ketoacidosis?

- 1- Olanzapine
- 2- Omeprazole
- 3- Progestogen only contraceptive pill

4- Sodium valproate

5- Venlafaxine

Answer & CommentsAnswer: 1- Olanzapine

The atypical antipsychotics such as Olanzapine have been implicated in precipitating diabetes as well as diabetic ketoacidosis. Other drugs implicated include thiazide diuretics, beta sympathomimetics and steroids.



[Q: 712] OnExamination -
Endocrinology

A 22-year-old female student presents acutely unwell with vomiting and dehydration. She has a two month history of weight loss and thirst. Investigations confirm a diagnosis of diabetic ketoacidosis with a glucose of 29.3 mmol/l (3.5-5.5), a pH of 7.12 (7.35-7.45) on blood gas analysis and urinalysis reveals +++ ketones.

What percentage of Type 1 diabetics are initially diagnosed following presentation with diabetic ketoacidosis?

- 1- 5%
- 2- 10%
- 3- 15%
- 4- 25%
- 5- 40%

Answer & CommentsAnswer: 4- 25%

Approximately 25% of Type 1 diabetics will first present in diabetic ketoacidosis although often there are symptoms such as thirst, polyuria and weight loss which have been ignored.



[Q: 713] OnExamination -
Endocrinology

A 70-year old type 2 diabetic for 20 years is

referred to the clinic because of poor glycaemic control despite recent dietetic input. He has a history of previous 2 myocardial infarctions, and gets exertional angina at 50 yards. He has previously had angioplasty to both his lower limbs and despite this has a claudication distance of 40 yards. He is in New York heart failure class 2-3. Additionally he has diabetic maculopathy, and distal sensory neuropathy. His home blood monitoring readings are 10-15 before breakfast. His current treatment includes Metformin 500mg tds, Glimepiride 4mg daily, Insulin glargine 20units at night. Perindopril 8mg od, Furosemide 80mg daily, Aspirin 75mg daily, Atorvastatin 20mg daily. On examination his BMI is 30, with a BP of 140/70mmHg.

HbA1c 9.2%

fasting glucose 13.4 mmol/l (3.5-6)

Creatinine 130 μ mol/l (50-100)

Liver function Normal.

What is the most appropriate strategy to improve his glycaemic control?

- 1- Add prandial insulin (eg Novorapid) tds
- 2- Add premixed insulin (eg humalog 25) bd and stop Lantus
- 3- Add Rosiglitazone 4mg daily
- 4- Substitute metformin with Avandamet 4/500mg bd
- 5- Up titrate the dose of Insulin glargine

Answer & CommentsAnswer: 5- Up titrate the dose of Insulin glargine

This patient has uncontrolled glycaemia despite maximal oral therapy and dietary intervention. Rosiglitazone is already contraindicated because of the history of heart failure and the use of insulin. The current basal insulin regime of Glargine is failing to control his glycaemia, however the

current dose is inadequate. Current practice would favour increasing the dose of lantus aiming for a fasting (pre breakfast) BM of <7.0. Only once fasting readings of this level are achieved with a sub optimal HbA1c would one think of adding a prandial insulin. The caveat would be nocturnal hypoglycaemia however this was not mentioned in the vignette.



[Q: 714] OnExamination -
Endocrinology

A 62-year-old type 2 diabetic for 10 years attends for his annual review. His home blood glucose levels are 7-10 pre breakfast, he remains overweight despite following his diet and being regularly active, unfortunately he still smokes 10 cigarettes a day. His medication includes Metformin 850mg tds, Gliclazide 160mg bd, Simvastatin 40mg od, Aspirin 75mg od, Ramipril 10mg od. On examination his blood pressure is 145/85mmHg with a BMI of 31.2, he has background diabetic retinopathy, with a distal sensory neuropathy. His pre clinic biochemistry is as follows.

HbA1c 8.5% (<6%)

Fasting glucose 10.5mmol/l (3.5-6)

Serum creatinine 190 µmol/l (50-100)

eGFR 40ml/min/1.73m₂

Total Cholesterol 5.5 mmol/l (<5.5)

LDL cholesterol 3.2 mmol/l (<4)

HDL cholesterol 0.95 mmol/l (1-2)

Urine albumin creatinine ratio 10mg/mmol

What is the appropriate intervention?

- 1- Add insulin glargine to current treatment
- 2- Add Novorapid tds and insulin glargine
- 3- Add Rosiglitazone 4mg/day
- 4- Stop Gliclazide and Metformin and use insulin glargine.
- 5- Stop Metformin and commence insulin glargine

Answer & Comments

Answer: 5- Stop Metformin and commence insulin glargine

This patient has diabetic nephropathy as evidence by proteinuria, hypertension and eGFR consistent with stage 3 chronic kidney disease. Current practice recommends the discontinuation of metformin if there is evidence of a reduced glomerular filtration rate evidence by a creatinine of >130µmol/l or eGFR <60ml/min/1.73m². Therefore Metformin should be stopped; this will lead to inevitable decline in overall diabetic control, which will need insulin therapy, which can be used alongside the sulphonylurea gliclazide. The use of rosiglitazone is relatively contraindicated given the renal impairment.



[Q: 715] OnExamination -
Endocrinology

A 52-year-old male with a history of dyslipidaemia and hypertension attends the surgery for a 75g oral glucose tolerance test (OGTT) as part of his cardiovascular risk assessment and screening for type 2 diabetes. He is overweight with a BMI of 29 kg/m², his blood pressure is 135/85 mmHg on a combination of Amlodipine and Perindopril.

His venous plasma OGTT result is as follows.

0 minutes 6.3

120 minutes 10.4

Which of the following do these results suggest?

- 1- Impaired fasting glucose (IFG)
- 2- Impaired fasting glucose and impaired glucose tolerance
- 3- Impaired glucose tolerance (IGT)
- 4- Normal glucose tolerance.
- 5- Type 2 diabetes

Answer & Comments

Answer: 2- Impaired fasting glucose and impaired glucose tolerance

The WHO recommend the use of the OGTT for the diagnosis of type 2 diabetes as it incorporates the fasting and 2 hour post glucose load which can identify different sub groups of diabetic patients and different categories of individuals at risk of type 2 diabetes.

The diagnostic criteria are:

Venous plasma glucose Fasting (mmol/l)

2 hour post glucose (mmol/l)

Diabetic > 7.0 > 11.1

IGT <7.0 7.8-11.0

IFG 6.1-6.9 <7.8

In the absence of marked hyperglycaemia and symptoms such as weight loss, polyuria or polydipsia these results should be confirmed by a repeat test on another day.



[Q: 716] OnExamination - Endocrinology

When considering diabetic retinopathy which of the following statements is most accurate:

- 1- Microaneurysms represent sacular dilatation of retinal arterioles
- 2- Hard exudates represent calcium deposits in the retina
- 3- Cotton wool spots represent infarcts of the nerve fibre layer of the retina
- 4- Haemorrhages close to the fovea are not potentially sight threatening
- 5- Laser photocoagulation is applied directly to new vessels to destroy them

Answer & Comments

Answer: 3- Cotton wool spots represent infarcts of the nerve fibre layer of the retina

MAAs are capillary aneurysms. HEs are collections of exudated lipid and protein. C is correct, multiple CWS are a pre-proliferative sign. Haemorrhages (or HEs) close to the fovea represent a risk of macular oedema and are therefore sight threatening. Laser destroys ischaemic but viable retina to reduce the secretion of angiogenic growth factors and allow new vessel regression, it is not applied directly to new vessels as this would cause bleeding.



[Q: 717] OnExamination - Endocrinology

A 32-year-old male physical education teacher has a 3 year history of type 1 diabetes. At the last annual review, his HbA1c was 6.8% but he complains of hypoglycaemic events particularly during exercise. He has been commenced on the insulin analogue - Lispro insulin.

Compared with conventional short-acting insulins what is the advantage of insulin analogue therapy?

- 1- Significant improvement in HbA1c
- 2- Reduces post-prandial glucose concentrations
- 3- Reduces the incidence of long-term diabetic complications
- 4- Reduces the incidence of hypoglycaemic events
- 5- Longer duration of action

Answer & Comments

Answer: 2- Reduces post-prandial glucose concentrations

The short acting Insulin analogue, Lispro has a rapid onset of action and a shorter duration of action than conventional short acting soluble insulins. Consequently studies reveal reduced post-prandial glucose concentrations versus soluble insulin and potentially a reduced

incidence of hypoglycaemia although the evidence for this is lacking.



[Q: 718] OnExamination - Endocrinology

A 50-year-old man with a history of Diabetes Mellitus and hypertension attends an ophthalmic clinic for regular assessment. On fundoscopy he is diagnosed to have preproliferative diabetic retinopathy.

Which of the following is characteristic of preproliferative diabetic retinopathy?

- 1- New vessels at the disc
- 2- Microaneurysms
- 3- Hard Exudates
- 4- Venous Beading
- 5- Macular Odema

Answer & Comments

Answer: 4- Venous Beading

2,3 and 5 suggest background diabetic retinopathy. Venous beading, loops and soft exudates (cotton wool spots) are characteristic of preproliferative diabetic retinopathy. New vessels suggest proliferative retinopathy.



[Q: 719] OnExamination - Endocrinology

A 43-year-old male is diagnosed with diabetic nephropathy. If this patient had type 1 diabetes his chances of progressing to End Stage Renal Disease (ESRD) would be approximately 50%.

What percentage of type II diabetics with diabetic nephropathy would be expected to progress to ESRD?

- 1- 15%
- 2- 30%
- 3- 45%
- 4- 50%

5- 55%

Answer & Comments

Answer: 1- 15%

Although the incidence of diabetic nephropathy is less in type 2 diabetics as approximately 90-95% of all diabetics are type IIs, the majority of patients with diabetic nephropathy are type II diabetics. There are a number of stages in the development of nephropathy with glomerular hyperfiltration being an early feature. Nephropathy itself is signaled by the excretion of trace amounts of protein in the urine ?microalbuminuria. The progression of the disease may be attenuated by stringent blood pressure control (with an ACEi) and strict glycaemic control.



[Q: 720] OnExamination - Endocrinology

A 72-year-old male presents with a 2 month history of weight loss and weakness. Examination reveals a BMI of 24.5 kg/m² and a blood pressure of 146/90 mmHg. Examination of the lower limbs reveals a bilateral weakness of knee extension. He is unable to rise from the squatting position. There is absence of the knee reflex but the ankle reflexes are preserved and both plantars are flexor. There are no abnormalities on sensory examination.

Which of the following tests may be diagnostic?

- 1- Vitamin B₁₂ concentration
- 2- Thyroid function test
- 3- Oral glucose tolerance test
- 4- Urine free cortisol concentration
- 5- Vitamin D concentration

Answer & Comments

Answer: 3- Oral glucose tolerance test

This patient presents with weight loss, and reduced quadriceps strength, bilaterally with

absent knee reflexes. This is a typical presentation of diabetic amyotrophy. Osteomalacia, hyperthyroidism and Cushing's would be unlikely as the proximal myopathy involves quadriceps and hamstrings and knee reflexes would be preserved. Subacute combined degeneration of the cord does not present with such features.



[Q: 721] OnExamination - Endocrinology

A 64-year-old retired Caucasian solicitor attends the surgery. He is overweight and takes little exercise. He has been treated for hypertension for 5 years and is controlled on 5mg of Ramipril. He also takes 20mg of Simvastatin for hypercholesterolaemia. A 75g oral glucose tolerance test was recently performed and gave a result consistent with impaired glucose tolerance (IGT) with a 2 hour plasma glucose concentration of 9.3mmol/l. The patient is keen to know what would be his risk of developing type 2 diabetes.

What do you tell him?

- 1- 6% over 6 years
- 2- 10% over 6 years
- 3- 33% over 6 years
- 4- 60% over 6 years
- 5- 100% over 6 years

Answer & Comments

Answer: 3- 33% over 6 years

Individuals with IGT are at significant risk of progression to type 2 diabetes. A number of studies have looked at the absolute risk of progression from IGT to type 2 diabetes. The large and widely quoted Hoorn study which looked at 1342 Caucasian non-diabetic subjects found that 33.8% progressed to type 2 diabetes over 6 years follow up. This increased to 64.5% if individuals had both IGT and IFG. A similar rate of progression for individuals with IGT was Vaccaro who studied

a Caucasian group in Italy. Intensive lifestyle changes involving diet changes, regular exercise and weight loss have been shown to reduce the rate of progression to type 2 diabetes.



[Q: 722] OnExamination - Endocrinology

A 45-year-old man with Type 2 Diabetes is being treated with Exenatide.

Which of the following would be a recognised adverse effect of his treatment?

- 1- Hyperglycaemia
- 2- Hypertension
- 3- Peripheral oedema
- 4- Renal impairment
- 5- Weight loss

Answer & Comments

Answer: 5- Weight loss

Exenatide (synthetic exendin-4) is a new agent for the treatment of Type 2 Diabetes. Exendin-4 occurs naturally in the saliva venom of the North American lizard called the Gila Monster. It mimics the action of the gut hormone GLP-1 (Glucagon-like peptide 1). It causes hypoglycaemia (which is its therapeutic effect) especially when used in combination with oral antidiabetic drugs, weight loss, nausea and other gastrointestinal side effects.



[Q: 723] OnExamination - Endocrinology

A 32-year-old male with type 1 diabetes undergoes a 24 hour urine collection.

Which of the following urine albumin concentrations signify microalbuminuria?

- 1- 10 mg/day
- 2- 50 mg/day
- 3- 500 mg/day
- 4- 1g/day

5- 3.5 g/day

Answer & CommentsAnswer: 2- 50 mg/day

Microalbuminuria is defined as a urine albumin excretion of between 20-200 micrograms/min urine or between 30-300 mg/day. A concentration above 300 mg/day signifies albuminuria and a concentration above 3.5g/day signifies overt proteinuria. Microalbuminuria is not just an indicator of early renal involvement but it also identifies increased cardiovascular risk with an approximate two fold cardiovascular risk above the already increased risk in the diabetic population. A useful surrogate of the total albumin excretion is the albumin:creatinine ratio. The urinary albumin:creatinine ratio is measured using the first morning urine sample where practicable. Microalbuminuria is indicated where there is an albumin:creatinine ratio ≥ 2.5 mg/mmol (men) or 3.5 mg/mmol (women). Proteinuria is indicated by a ratio of ≥ 30 mg/mmol.



[Q: 724] OnExamination -
Endocrinology

A 23-year-old woman with type 1 diabetes of three years duration, presents for annual review with weight loss. She had normal menstrual cycles and bowel habit was unchanged. On examination her BMI was 23 kg/m² and investigations revealed a haemoglobin of 7 g/dl and a MCV of 69 fl.

Which of the following is the most likely diagnosis?

- 1- anorexia nervosa
- 2- beta-thalassaemia minor
- 3- Bacterial overgrowth
- 4- coeliac disease
- 5- Crohn's disease

Answer & CommentsAnswer: 4- coeliac disease

Coeliac disease is the likely option as this patient has autoimmune disease (T1DM), an iron deficiency anaemia and little in the way of symptoms. Bacterial overgrowth is associated with profuse diarrhoea and a macrocytosis due to vit B12 consumption. Crohn's disease again would be expected to be symptomatic.



[Q: 725] OnExamination -
Endocrinology

A 17-year-old type 1 diabetic presents for annual review. He takes three times daily short acting insulin with evening dose long acting insulin. His glycaemic control is good as reflected by an HbA1c of 6.5%. He seeks advice regarding his ability to pursue a future career.

Which one of the following occupations would he be able to pursue?

- 1- A chef in the army catering corps
- 2- A steward on board a cruise liner
- 3- A oil rig engineer
- 4- A police officer
- 5- An airline steward

Answer & CommentsAnswer: 5- An airline steward

Careers opportunities are affected by insulin use in Diabetes Mellitus and it is important to know these restrictions in order that you can provide appropriate advice to your patient. Any employment in the armed forces, fire service or police force is not permissible unless already a member of the armed forces. Offshore work again is not an option.



[Q: 726] OnExamination -
Endocrinology

You are consulted by a 52-year-old man with type 2 diabetes diagnosed for 1 year. His blood pressure is 156/88 mmHg, his cholesterol is 5.3mmol/l, he has a BMI of 29 and does not smoke. His HbA1c is 7.9%, he currently takes only Metformin 500mg bd.

The single intervention most likely to reduce his overall risk of microvascular and macrovascular events is:

- 1- Statin therapy
- 2- Sulphonylurea therapy
- 3- Antihypertensive therapy
- 4- Weight reduction
- 5- Aspirin therapy

Answer & Comments

Answer: 3- Antihypertensive therapy

The UKPDS showed that effective antihypertensive therapy reduced the risk of cardiovascular events and microvascular complications. Lowering HbA1c only resulted in a significant reduction in microvascular events. Lipid lowering therapy benefits patients with diabetes as much as those without diabetes in preventing macrovascular events in sub group analyses but has no effect on microvascular events demonstrated so far. Aspirin is recommended to type 2 patients with one other cardiovascular risk factor but there is little trial evidence of efficacy. Weight reduction may reduce progression to overt diabetes from states of impaired glucose tolerance but has not been demonstrated to reduce microvascular risk in diabetes.



[Q: 727] OnExamination -
Endocrinology

A 45-year-old male presents concerned about his risk of developing diabetes. His family history reveals that his mother and maternal uncle are both diabetic. On examination, his

blood pressure is 130/82 mmHg, his BMI is 30.8 kg/m². His investigations reveal:

Fasting cholesterol	5.2 mmol/l (<5.2)
Triglycerides	1.4 mmol/l (0.8-1.5)
HDL cholesterol	1.0 mmol/l (0.9-1.4)
Fasting glucose	6.2 mmol/l (3.5-6)

Which of this man's observations fulfills the criteria for the diagnosis of the metabolic syndrome?

- 1- Blood pressure of 130/82 mmHg
- 2- BMI of 30.2 kg/m²
- 3- Fasting plasma glucose of 6.2 mmol/l
- 4- HDL concentration of 1 mmol/l
- 5- Triglyceride concentration of 1.4 mmol/l

Answer & Comments

Answer: 3- Fasting plasma glucose of 6.2 mmol/l

The metabolic syndrome is becoming hugely important as a cluster of feature associated with increased cardiovascular and diabetes risk. The condition is defined by the NCEP-ATP III criteria as any three of the following features:

- " Waist circumference >102cm male; >96cm female
- " Hypertriglyceridaemia >1.7 mmol/l
- " Low HDL concentration <1.03 mmol/l male, <1.3 mmol/l female
- " BP > or = 130/85 mmHg
- " Fasting glucose > or = 6.1 mmol/l

Thus, in our patients case the elevated fasting glucose of 6.3 mmol/l fulfills this diagnostic criterion. The BMI is not a function of the diagnostic criterion as the waist circumference appear to be a far more powerful predictor of risk.



[Q: 728] OnExamination -
Endocrinology

A 75-year-old man is admitted with a blood sugar of 40 mmol/l and lobar pneumonia and dies despite treatment. Post-mortem examination reports the presence of amyloid polypeptide on pancreatic histology.

This would suggest

- 1- that he has type 2 diabetes
- 2- that he has type 1 diabetes
- 3- that he has diabetes secondary to amyloidosis
- 4- that he has chronic pancreatitis as a cause of diabetes
- 5- this can be a non-specific finding

Answer & Comments

Answer: 1- that he has type 2 diabetes

The presence of amyloid polypeptide on pancreatic histology is highly suggestive of type 2 diabetes. Although the primary defect in type 2 diabetes is insulin resistance, loss of insulin secretory function over time does occur in type 2 diabetic patients, and reduction in beta cell mass due to amyloid deposition may partly account for this.



[Q: 729] OnExamination -
Endocrinology

A 54 year-old male presents with progressive pins and needles and numbness in both feet which have deteriorated over the last six months. He has a 10 year history of Type 2 diabetes mellitus and had cervical spondylosis for which he underwent surgery 8 years ago. He also confessed to drinking approximately 40 units of alcohol weekly.

On examination he had a mild bilateral weakness of foot dorsiflexion, both ankle reflexes were absent and plantar responses were flexor. There was absent sensation to light touch to mid-shin level with loss of joint

position sensation in the toes and absent vibration sensation below the hips. He had a marked sensory ataxia and pseudoathetosis of upper limbs. He had no evidence of a retinopathy and urinalysis was normal.

What is the most likely diagnosis?

- 1- Alcohol-induced neuropathy
- 2- Central lumbar disc prolapse
- 3- Cervical cord compression
- 4- Diabetic peripheral neuropathy
- 5- Vitamin B₁₂ deficiency

Answer & Comments

Answer: 5- Vitamin B₁₂ deficiency

Diabetic peripheral neuropathy usually goes in parallel with retinopathy and nephropathy. It is also slowly progressive and affects mainly spinothalamic pathway. Alcohol induced peripheral neuropathy is also slowly progressive and affects mainly spinothalamic pathway. Vitamin B₁₂ deficiency usually causes a more rapidly progressive neuropathy with dorsal column involvement (joint position and vibration involvement with sensory ataxia and pseudoathetosis of upper limbs).



[Q: 730] OnExamination -
Endocrinology

A 49-year-old male attends regarding a concern over the future development of obesity. He has read on the internet about the metabolic syndrome and its association with diabetes. He wonders if he has this diagnosis.

Which of the following is a specific criteria in the diagnosis of the metabolic syndrome?

- 1- A body mass index of 32 kg/m²
- 2- A family history of type 2 diabetes
- 3- A fasting plasma glucose of 5.9 mmol/l (NR 3.5-6)
- 4- A total cholesterol of 6.2 mmol/l (NR less than 6)

5- A waist circumference of 104 cm (41 inches)

Answer & Comments

Answer: 5- A waist circumference of 104 cm (41 inches)

The metabolic syndrome has been defined as the possession of any three of the following five criteria: A blood pressure above 130/85; HDL less than 1 mmol/l males, 1.3 mmol/l females; triglycerides above 1.7 mmol/l; fasting plasma glucose above 6.1 mmol/l and waist circumference above 88cm females and 102 cm males. The importance of the metabolic syndrome is in its associated morbidity, with a 4x increased risk of developing diabetes and a two fold risk of developing ischaemic heart disease. Central obesity is more highly correlated with the metabolic risk factors than body mass index (BMI) and therefore measurement of waist circumference is recommended to identify the bodyweight component of metabolic syndrome.



[Q: 731] OnExamination - Endocrinology

Which of the following is a metabolic effect of exenatide?

- 1- accelerates gastric emptying
- 2- improves insulin sensitivity
- 3- inhibits insulin release
- 4- promotes gluconeogenesis by the liver
- 5- suppresses appetite

Answer & Comments

Answer: 5- suppresses appetite

Exenatide mimics the effect of the gut hormone GLP-1 (Glucagon-like peptide 1) and has favourable effects on the metabolism of individuals with diabetes mellitus. Exenatide suppresses appetite, inhibits glucose production in the liver, slows gastric emptying

and stimulates insulin release. It does not increase insulin sensitivity which is achieved by drugs such as metformin and the glitazones.

In summary Exenatide has the following metabolic effects

- Stimulates insulin release
- Inhibits glucose production by the liver
- Slows gastric emptying
- Suppresses appetite

Diabetes Care 27:2628-2635, 2004



[Q: 732] OnExamination - Endocrinology

According to the new revised criteria for diagnosing diabetes in an asymptomatic patient

- 1- A single fasting venous plasma glucose concentration of > 7 mmol/l can be used to diagnose diabetes
- 2- Two separate fasting venous plasma glucose concentration of > 7 mmol/l is diagnostic of diabetes
- 3- 75 gm oral glucose test is mandatory for diagnosing diabetes
- 4- A fasting venous plasma concentration of < 6.9 can be ignored
- 5- Impaired glucose tolerance is signified by a venous glucose concentration of ?7 mmol and > 11.1 mmol

Answer & Comments

Answer: 2- Two separate fasting venous plasma glucose concentration of > 7 mmol/l is diagnostic of diabetes

In an asymptomatic individual, a single sample alone is not sufficient for diagnosis. Diabetes can be diagnosed if separate fasting samples show above 7 mmol/l. 75 gram OGT is still the gold standard for diagnosing diabetes,

although fasting glucose can be used, provided adequate fast is ensured. Fasting glucose of above 6.1 but below 6.9 is classed as Impaired Fasting Glycaemia, which is a new category of glycaemia. IGT = 7.8 - 11.1



[Q: 733] OnExamination - Endocrinology

A 52-year-old man with a history of diabetes mellitus presented with hepatomegaly.

Investigations revealed:

Albumin 30 g/L (35-45)

Total bilirubin 22 umol/L (10-22)

Alkaline Phosphatase 134 iU/L (50-110)

ALT 90 iU/L (10-40)

gamma-glutamyl transferase 125 iU/L (10-50)

Ferritin 1450 microg/L (15-400)

Which of the following features would be most suggestive of a diagnosis of haemochromatosis?

- 1- Chondrocalcinosis
- 2- Gynaecomastia
- 3- Migratory polyarthritisd myxoedema
- 4- Myxoedema
- 5- Rash

Answer & Comments

Answer: 1- Chondrocalcinosis

This diabetic male has evidence of liver disease with grossly elevated Ferritin suggesting a diagnosis of Haemochromatosis. A non-migratory polyarthritisd would be suggestive although an oligoarthritis particularly of the hands and hip is more typical. Skin pigmentation rather than a rash is more typical. Myxoedema is not a feature of haemochromatosis. Gynaecomastia is a feature of liver disease/cirrhosis per se and not just haemochromatosis. However, chondrocalcinosis together with the chronic

arthropathy is well recognized in association with haemochromatosis.



[Q: 734] OnExamination - Endocrinology

An 85-year-old woman with diabetes mellitus presented with sudden onset of wild flinging movements of the left arm which disappeared during sleep.

What is the most likely explanation?

- 1- Contralateral subthalamic nucleus infarction
- 2- Focal motor seizures
- 3- Hypoglycaemia
- 4- Ipsilateral caudate nucleus infarction
- 5- Ipsilateral cerebellar infarction

Answer & Comments

Answer: 1- Contralateral subthalamic nucleus infarction

This is hemiballismus, and in a diabetic patient is likely to be due to a vascular event in the contralateral subthalamic nucleus.



[Q: 735] OnExamination - Endocrinology

A 56-year-old female is noted to have hepatomegaly. Six years ago she was diagnosed with diabetes mellitus and takes metformin 500 mg tds and gliclazide 80mg bd. She drinks approximately 15 units of alcohol weekly and stopped smoking 10 years ago.

On examination she has a BMI of 36.2 kg/m, no stigmata of liver disease are evident but she has 6 cm hepatomegaly.

Investigations reveal:

Total bilirubin 11 umol/L (NR 1 - 22)

Alkaline phosphatase 145 IU/L (NR 45 - 105)

AST 100 IU/L (NR 1 - 31)

ALT 150 IU/L (NR 5 - 35)
 Albumin 40 g/L (NR 37 - 49)
 Ferritin 434 mg/L (NR 15 - 300)

Ultrasound of the abdomen reveals an echobright appearance of the liver and gallstones in the gallbladder.

What is the most cause of her liver disease?

- 1- Alcoholic liver disease
- 2- Drug induced hepatitis
- 3- Gallstone disease
- 4- Haemochromatosis
- 5- Non-alcoholic steatohepatitis (NASH)

Answer & Comments

Answer: 5- Non-alcoholic steatohepatitis (NASH)

The patient has a hepatic picture in contrast to Cholestasis. Ferritin level is not too high to be considered for haemochromatosis and is an acute phase reactant being typically increased in any inflammatory process. NASH is very common and is typically encountered in Obese patients, presenting with a hepatic picture with or without jaundice. Echo bright liver suggests fatty change in the liver seen in NASH. It was previously termed Idiopathic decompensated hepatitis and if not treated in terms of lowering BMI and reducing fat intake can lead onto irreversible cirrhosis. Gallstones are a distraction in this history.



[Q: 736] OnExamination - Endocrinology

A 57-year-old man attends the outpatient clinic. He has been a type 2 diabetic for 7 years having been diagnosed following after an acute myocardial infarction at 50 years of age. His diabetic was deteriorating with blood glucose readings of 9-12 at home despite following a diet and taking regular exercise. Another practitioner commenced him on Rosiglitazone. His current treatment is

Metformin 850tds, Rosiglitazone 4mg, Aspirin 75mg/day, Carvedilol 12.5mg bd, Ramipril 10mg od, Furosemide 80mg daily, Simvastatin 40mg/day. On examination he is overweight with a BMI of 29, his BP is 128/74mmHg with pulse rate of 63min⁻¹ he has no heart murmurs there is some pitting oedema in the lower limbs. Auscultation reveals a clear chest with no evidence of pulmonary oedema. He is obese with no organomegaly.

His ECG shows sinus rhythm with poor r wave progression.

His HbA1c checked in the clinic is 8.5%.

What is the most appropriate way to treat his glycaemic control.

- 1- Add Gliclazide 80mg bd
- 2- Increase Rosiglitazone to 8mg daily
- 3- Stop metformin and use Avandamet (combination of Metformin & Rosiglitazone)
- 4- Substitute Rosiglitazone with Pioglitazone 15mg daily
- 5- Substitute Rosiglitazone with Glilazide 80mg bd

Answer & Comments

Answer: 5- Substitute Rosiglitazone with Glilazide 80mg bd

This patient is likely to be insulin resistant however there is evidence of heart failure and fluid overload, so use of a thiazolidinediones (Rosiglitazone or Pioglitazone) is absolutely contraindicated. These drugs promote fluid retention by means of an action on the collecting ducts of the kidney so promoting sodium and water retention. The only appropriate action therefore is to stop Rosiglitazone, substituting this with the insulin secreatagogue gliclazide will hopefully improve his glycaemic control.



[Q: 737] OnExamination -
Endocrinology

A 40-year-old diabetic presents with deteriorating thirst and nocturia. He has been diagnosed with diabetes mellitus 5 years ago and is now taking maximal Metformin and Gliclazide yet his HbA1c is 10.9%. You want to change him to insulin but he informs you that he is employed as a lorry driver.

What would be the impact of converting him to insulin on his Heavy Goods Vehicle licence?

- 1- Can keep his HGV licence
- 2- Can regain his HGV licence if after six months he does not have any hypoglycaemic episodes
- 3- Can regain his HGV licence after one year without hypoglycaemic episodes
- 4- Temporary suspension of his HGV licence until established on stable doses of insulin
- 5- Will lose his HGV licence indefinitely whilst treated with insulin

Answer & Comments

Answer: 5- Will lose his HGV licence indefinitely whilst treated with insulin

Switching patients to insulin does have a major impact on their ability to pursue certain careers and/or vehicle licensing. Insulin treated diabetics are unable to hold a HGV or PSV licence and in some councils are unable to have a taxi licence. For further reading on employment restrictions an diabetes read



[Q: 738] OnExamination -
Endocrinology

An overweight, 60-year-old female with an 8 year history of type 2 diabetes mellitus presents with deteriorating glycaemic control. She takes gliclazide 160 mg twice daily.

Investigations reveal:

Sodium and potassium normal

serum urea 10 mmol/L (2.5 - 7.5)

serum creatinine 160 μ mol/L (60 - 110)

serum alanine transaminase 31 U/L (5 - 35)

serum aspartate transferase 30 U/L (1 - 31)

HbA1C 9.0% (3.8 - 6.4)

Which of the following would be most appropriate additional therapy for improved glycaemic control?

- 1- Acarbose
- 2- guar gum
- 3- metformin
- 4- repaglinide
- 5- rosiglitazone

Answer & Comments

Answer: 5- rosiglitazone

This diabetic has poor glycaemic control with renal impairment. With creatinine concentrations above 150 mmol/L, metformin is not recommended due to the small risk of lactic acidosis. Therefore, the most appropriate treatment as recommended by NICE would be rosiglitazone as LFTs are normal and there is no suggestion of heart failure. Acarbose is poorly tolerated and is now rarely prescribed. Guar gum has little place in the treatment of diabetes. Repaglinide the non-sulphonylurea insulin secretagogue would have little benefit in conjunction with a traditional SU such as Gliclazide.



[Q: 739] OnExamination -
Endocrinology

A 26-year-old male with a three year history of type 1 diabetes presents with fever, vomiting and is dehydrated. He has a sodium concentration of 148 mmol/L, a potassium of 3.3 mmol/L, a urea of 24 mmol/L, a glucose of 33 mmol/L and a pH of 7.18.

What would be the typical total body water deficit associated with his diabetic ketoacidosis?

- 1- 1 litre
- 2- 3 litres
- 3- 6 litres
- 4- 8 litres
- 5- 10 litres

Answer & Comments

Answer: 3- 6 litres

The typical fluid deficit associated with DKA is approximately 6 litres. The initial half of this amount is derived from intracellular fluid and precedes signs of dehydration, while the other half is from extracellular fluid and is responsible for clinical signs of dehydration. Appropriate fluid replacement requires 1 litre of Normal saline over the first 1/2 hour, then 1 litre over the next hour, then 1 litre over the next two hours followed by 1 litre every 4 hours depending on the degree of dehydration.



[Q: 740] OnExamination - Endocrinology

A 33-year-old type 1 diabetic male presents with a two day history of pain, swelling and redness in his left middle finger. This began after he pricked his finger in the garden whilst pruning a bush. His diabetic control has been quite reasonable with a HbA1c of 7.1% on basal bolus insulin consisting of Lispro tds and Humulin I in the evenings. On examination he has a painful, red and swollen middle finger with the redness extending to the metacarpophalangeal joint. He is diagnosed with cellulites.

What is the most appropriate treatment for this patient?

- 1- Admit to hospital for IV antibiotics
- 2- Oral flucloxacillin only
- 3- Oral metronidazole only
- 4- Oral penicillin V only
- 5- Oral penicillin V and flucloxacillin

Answer & Comments

Answer: 5- Oral penicillin V and flucloxacillin

The patient has digital cellulitis and the most likely organisms responsible are *Strep pyogenes* or *Staphylococcus aureus*. The most appropriate treatment is penicillin V and Flucloxacillin which should result in a rapid improvement. If there is a deterioration then admission for IV antibiotics may be required but this should be unnecessary with appropriate antibiotic selection.



[Q: 741] OnExamination - Endocrinology

A 35 year-old woman with type 1 diabetes mellitus presents for annual assessment.

Which one of the following features on fundoscopy would require urgent referral to an ophthalmologist?

- 1- asteroid bodies
- 2- hard exudates in the macular region
- 3- intraretinal microvascular abnormalities
- 4- scattered microaneurysms
- 5- soft exudates

Answer & Comments

Answer: 2- hard exudates in the macular region

Scattered microaneurysms signify background DRn. IRMAs and soft exudates signify pre-proliferative retinopathy. According to the NleH, urgent referral to an ophthalmologist (seen within one week) is required if there is proliferative retinopathy or there is evidence of clinically significant macular oedema (hard exudates at the fovea).



[Q: 742] OnExamination -
Endocrinology

An asymptomatic 56-year-old man with a family history of type 2 diabetes was found to have a fasting venous glucose of 6.5 mmol/l.

Which of the following relating to his further investigation is correct?

- 1- He has impaired glucose tolerance
- 2- This does not need further investigation
- 3- He should be investigated further by another fasting venous sampling
- 4- He should undergo a 75 gm oral glucose tolerance test.
- 5- He should be treated with oral hypoglycaemics in the first instance

Answer & Comments

Answer: 4- He should undergo a 75 gm oral glucose tolerance test.

According to the new revised criteria for the diagnosis of diabetes, venous plasma glucose (VPG) of 6.1 - 6.9 is categorised as Impaired Fasting Glycaemia and requires further assessment with a 75 gram oral glucose tolerance test (OGT) which is still the gold standard. A 2 hour value of equal to or over 11.1 mmol/l is diagnostic of diabetes. Impaired glucose tolerance is a 2 hour VPG of 7.8 - 11.1 during an OGT. Initial treatment of type 2 diabetes is patient education, diet and lifestyle changes



[Q: 743] OnExamination -
Endocrinology

To which of the following drug classes do the oral hypoglycaemic agents, Rosiglitazone and Pioglitazone belong?

- 1- A Peroxisome Proliferator Activating Receptor (PPAR)-alpha agonist
- 2- A Peroxisome Proliferator Activating Receptor (PPAR)-gamma agonist
- 3- A Sulphonylurea

4- A Biguanide

5- An alpha-Glucosidase inhibitor

Answer & Comments

Answer: 2- A Peroxisome Proliferator Activating Receptor (PPAR)-gamma agonist

Rosi- and Pio- glitazone belong to a new class of oral hypoglycaemic agents - PPAR gamma agonists. Through activation of this receptor they modulate adipocyte function and improves insulin sensitivity.



[Q: 744] OnExamination -
Endocrinology

A 37-year-old female with type 2 diabetes and obesity requests help with regard to weight loss. She has tried to lose weight with dietary manoeuvres but has succeeded in losing only 3kg over the last year. She is currently receiving no treatment. On examination her BMI is 33.5 kg/m² and her blood pressure is 142/84 mmHg. Her most recent HbA1c is 6.9%. She asks whether there are any pharmacological therapies that may be appropriate for assisting with weight reduction.

Which of the following agents is appropriate for assisting with weight loss in this patient?

- 1- Dexfenfluramine
- 2- Metformin
- 3- Orlistat (Xenical)
- 4- Phentermine
- 5- Sibutramine (Reductil)

Answer & Comments

Answer: 3- Orlistat (Xenical)

This patient has demonstrated a 3kg weight loss over the past year but like many has become rather stuck. The NICE criteria for Orlistat previously stated it should be used in patients who have demonstrated dietary

compliance with at least a 2.5 kg weight reduction prior to initiating Orlistat. This is not now a requirement. Continued weight reduction is required if the patient is to remain on the drug (5% body weight at 12 weeks). Orlistat functions through inhibiting the absorption of dietary fat from the GI tract. Consequently, its side effects include flatulence and diarrhoea. Dexfenfluramine is associated with systemic hypertension and strokes and is now withdrawn as an anti-obesity agent, as is phentermine (valvular fibrosis) in the successful but dangerous combination Phen-Fen. Metformin is not an agent that would create weight loss but merely improves insulin sensitivity and maintain rather than lose weight (or gain weight as in sulphonylurea therapy). Similarly this patient's HbA1c is well controlled on diet alone. Sibutramine is another licensed drug for the treatment of obesity but is contraindicated in hypertension as it may be associated with increased BP. Consequently NICE recommend monitoring BP during treatment.



[Q: 745] OnExamination - Endocrinology

A 63 year female with a 12 year history of hypertension and diabetes has been treated with metformin 1g bd, Gliclazide 80 mg bd, Rosuvastatin 10mg daily, Ramipril 10 mg daily, aspirin 75 mg daily and amlodipine 10 mg daily for the last two years. At annual review her blood pressure is 138/82 mmHg, fundi reveal background diabetic retinopathy, foot pulses are normal but she has evidence of a peripheral sensory loss to the ankles in both feet. Her results show a HbA1c of 7.2% (NR <6.5), a urea of 12.5 mmol/l (NR 3-7), creatinine of 176 micromol/l and cholesterol of 4.8 mmol/l.

Which of the following drugs should be withdrawn?

1- Aspirin

- 2- Gliclazide
- 3- Metformin
- 4- Ramipril
- 5- Rosuvastatin

Answer & Comments

Answer: 3- Metformin

This patient has evidence of chronic renal impairment with elevated creatinine and urea. Guidelines currently suggest that metformin should be stopped if creatinine is above 150 micromol/l. The estimated prevalence of life-threatening lactic acidosis is one to five cases per 100 000, with mortality in reported cases up to 50%. Traditionally, this complication has been thought of as secondary to an accumulation of the drug. Metformin is excreted unchanged in the urine, with the half-life prolonged and renal clearance decreased in proportion to any decrease in creatinine clearance. This may occur chronically in chronic renal impairment, or acutely with dehydration, shock, and intravascular administration of iodinated contrast agents, all of which have the potential to alter renal function. Tissue hypoxia also has a significant role, and acute or chronic conditions that may predispose to this condition, such as sepsis, acute myocardial infarction, pulmonary embolism, cardiac failure and chronic liver disease, may act as triggers. As the patient appears to have chronic renal impairment and as she has been on ramipril for a considerable period it is unlikely that she has renal artery stenosis requiring the withdrawal of the ACEi.



[Q: 746] OnExamination - Endocrinology

A 60-year-old male who was previously fit and well presented with a six week history of blurring of vision. His investigation revealed a fasting plasma glucose of 12.9 mmol/L (3.0 - 6.0).

What is the most likely cause of his blurred vision?

- 1- Cataract
- 2- Maculopathy
- 3- Osmotic changes in the lens
- 4- Proliferative diabetic retinopathy
- 5- Retinal vein thrombosis

Answer & Comments

Answer: 3- Osmotic changes in the lens

Without being given too much here, this patient is a newly diagnosed diabetic as we are told he was previously fit and well. Therefore the most probable explanation for his blurred vision is osmotic changes.



[Q: 747] OnExamination - Endocrinology

An 18-year-old man develops thirst, weight loss and polyuria. Investigations confirm that he has type 1 diabetes and is treated with basal bolus insulin. He is keen to know what limitations this diagnosis imposes on career opportunities.

Which of the following professions would he not be able to pursue?

- 1- Ambulance control centre worker
- 2- Civil engineer
- 3- Milkman
- 4- Physical Education instructor
- 5- Policeman

Answer & Comments

Answer: 5- Policeman

The armed forces, working offshore or aboard ships, air pilot, HGV/PSV licence, Police, Fire or driving in the post office are career paths closed to subjects with insulin dependent diabetes. Some local authorities do permit

licences to taxi drivers with insulin treated diabetes whilst others do not.



[Q: 748] OnExamination - Endocrinology

With respect to lipoprotein transport and metabolism in the body, the following statements are correct EXCEPT:

- 1- Arterial walls contain cells with LDL receptors.
- 2- Cholesterol is required for the formation of red blood cell membranes.
- 3- Chylomicrons are synthesized in the liver.
- 4- HDL is assembled in the extracellular space.
- 5- VLDL transformation to LDL occurs in adipose tissue.

Answer & Comments

Answer: 3- Chylomicrons are synthesized in the liver.

Chylomicrons are formed in the gut from exogenous triacylglycerols and cholesterol. They are released into the lymph and thereby enter the blood. They are not formed in the liver.



[Q: 749] OnExamination - Endocrinology

A 45-year-old man presents with an ulcer on his right foot. He has a twenty year history of type 1 diabetes and currently uses mixed insulin twice daily. On examination he has a small ulcer of approximately 2 cm diameter on the outer aspect of his right big toe. His peripheral pulses are all palpable but he has a peripheral neuropathy to the mid shins. The ulcer has an erythematous margin and is covered by pus.

What is the most likely infective organism?

- 1- Escherichia coli
- 2- MRSA

- 3- Pseudomonas aeruginosa
- 4- Staphylococcus aureus
- 5- Streptococcus pyogenes

Answer & Comments

Answer: 4- Staphylococcus aureus

Although the infective organism in diabetic foot ulcers are usually mixed, the most likely infective organism in this case is Staphylococcus aureus. MRSA would be less likely but might be suspected if the patient developed an infection in hospital or had recurrent admissions. The most appropriate antibiotic therapy is Flucloxacillin plus another broad spectrum agent with advice that the patient should not wear weight bearing and wear appropriate footwear.



[Q: 750] OnExamination - Endocrinology

A 42-year-old male presents with polyuria and polydipsia. He is a non-smoker and drinks approximately 12 units per week. He is employed as a taxi driver. On examination he has a BMI of 33.4 kg/m², a blood pressure of 132/82 mmHg with all other aspects of the cardiovascular examination normal. Investigations confirm a diagnosis of diabetes mellitus with a fasting blood glucose concentration of 12.1 mmol/l. His HbA1c is 9% and total cholesterol is 5.8 mmol/l.

What is the most appropriate initial treatment for this patient?

- 1- Diet and lifestyle advice
- 2- Gliclazide
- 3- Metformin
- 4- Orlistat
- 5- Simvastatin

Answer & Comments

Answer: 1- Diet and lifestyle advice

This patient who has typical type 2 diabetes, which should initially be treated with diet and lifestyle advice - appropriate dietary advice and exercise programme to endeavour to achieve weight loss. He should receive at least three months of this intervention before re-assessing and considering pharmacological intervention if the lifestyle approaches are not succeeding. If this is the case then the drug of choice would be metformin.



[Q: 751] OnExamination - Endocrinology

A 42-year-old man being investigated for diabetes and impotence is noted to have the following results:

Alanine aminotransferase 30 U/L (5-35)
 Aspartate aminotransferase 22 U/L (1-31)
 Fasting plasma glucose 7.4 mmol/L (3.0-6.0)
 Ferritin 500 ug/L (15-300)

Which one of the following would be the next most appropriate investigation?

- 1- bone marrow smear and iron stain
- 2- liver biopsy
- 3- red cell protoporphyrins
- 4- serum transferrin receptors
- 5- transferrin saturation

Answer & Comments

Answer: 5- transferrin saturation

This patient has a suspected diagnosis of haemochromatosis as suggested by the presentation and laboratory investigations including elevated ferritin. The next investigation would be measurement of transferrin saturation and then if elevated (above 45%) genotyping (Homozygosity for C282y mutations) would next be considered and would be expected to clinch the diagnosis. In the event of rarer mutations confirmation with liver biopsy may be required.



[Q: 752] OnExamination -
Endocrinology

A 30-year-old lady with long standing Type I diabetes presents with a 3 month history of pain and stiffness of the right shoulder. Passive and active movements of the shoulder are equally restricted.

What is the most likely diagnosis?

- 1- Rheumatoid arthritis
- 2- Osteoarthritis
- 3- Calcific tendinitis
- 4- Pyrophosphate arthropathy (pseudogout)
- 5- Adhesive capsulitis

Answer & Comments

Answer: 5- Adhesive capsulitis

Adhesive capsulitis (frozen shoulder) is strongly associated with diabetes with as many as 40% of patients developing this problem at some stage. The restricted active and passive movements confirm that this patient's problems are either capsular or articular in origin rather than periarticular tendon problems where active movements are generally more restricted than passive movements. The shoulder joint is rarely affected by primary osteoarthritis.



[Q: 753] OnExamination -
Endocrinology

A 35-year-old woman is noted to have ++ glycosuria by his GP. Her BMI is 35 kg/m² (18-25) and a fasting plasma glucose is 7.4 mmol/L (3.0-6.0).

Which one of the following measures would be most effective in reducing her insulin resistance?

- 1- Glibenclamide
- 2- Insulin
- 3- Metformin
- 4- Weight loss

5- Repaglinide

Answer & Comments

Answer: 4- Weight loss

The most appropriate treatment of this obese type 2 diabetic female which would also substantially reduce insulin concentrations is weight loss. Glibenclamide may be associated with increased insulin resistance as it stimulates insulin secretion, as does repaglinide. Metformin would improve insulin sensitivity but would not do it as much as weight loss. The unfortunate thing is that weight loss is the most difficult strategy for the patient to adhere to. Its much easier to take a pill than to diet.



[Q: 754] OnExamination -
Endocrinology

Inhaled insulin is approved for the treatment of diabetes.

In which of the following should inhaled insulin be avoided?

- 1- Autoimmune disease
- 2- Depression
- 3- Obesity
- 4- Peripheral vascular disease
- 5- Smokers

Answer & Comments

Answer: 5- Smokers

Exubera is the first licensed inhaled insulin. It is a fast acting insulin and studies reveal that it is as effective as subcutaneous insulin in both type 1 and type 2 diabetes. As a consequence of increased absorption and precipitation of hypoglycaemia, it is not recommended in smokers.



[Q: 755] OnExamination -
Endocrinology

A 55-year-old obese man with Type 2 Diabetes Mellitus is uncontrolled on diet alone.

Which antidiabetic therapy would increase insulin sensitivity in this patient?

- 1- Acarbose
- 2- Gliclazide
- 3- Glimiperide
- 4- Repaglinide
- 5- Rosiglitazone

Answer & Comments

Answer: 5- Rosiglitazone

Of the drugs listed only rosiglitazone would boost insulin sensitivity. Other thiazolidinediones such as pioglitazone would also do this as well as the more widely prescribed metformin!

Gliclazide, glimiperide and repaglinide are insulin secretagogues - they boost insulin secretion. Acarbose has a modest effect on the absorption of sugars from the gut but its main effect is to cause flatulence.

Type 2 Diabetes is due to two defects - insulin resistance and insulin deficiency. In 95% of patients it is insulin resistance that is the main cause of the diabetes. These patients are typically obese with features of the metabolic syndrome. The bulk of the insulin resistance appears to be in skeletal muscle. The state of insulin resistance is associated with abnormal glucose metabolism (obviously) and excessive free fatty acids in the blood. Drugs and lifestyle modifications that increase insulin sensitivity (and thereby reduce insulin resistance) help to reverse these abnormalities.



[Q: 756] OnExamination -
Endocrinology

A 44-year-old woman with type 1 diabetes mellitus has not attended the diabetic clinic for 5 years. Examination shows no abnormalities.

Investigations show:

Haemoglobin 9 g/dL

MCV 94 fL

Haematocrit 28%

HbA1c 10.1%

A blood smear shows normochromic, normocytic anaemia

Which of the following is the most likely cause?

- 1- acute blood loss
- 2- chronic lymphocytic leukaemia
- 3- erythropoietin deficiency
- 4- microangiopathic haemolysis
- 5- sideroblastic anaemia

Answer & Comments

Answer: 3- erythropoietin deficiency

The most likely cause is progressive renal failure which leads to reduced release of erythropoietin from the kidneys. Sideroblastic anaemia (myelodysplasia) is seen in older age groups. CLL or microangiopathic haemolysis are possible causes but unlikely.



[Q: 757] OnExamination -
Endocrinology

A 33-year-old woman with an eighteen year history of type I diabetes mellitus presents with proteinuria. She is a smoker of 20 cigarettes daily. Examination reveals a blood pressure of 155/95 mmHg. Investigations reveal:

serum cholesterol 7.6 mmol/L (<5.2)

HbA1c 8.3% (3.8 - 6.4)

24 hour urinary protein excretion 1.5 g (< 0.2)

Which intervention is most likely to retard the development of renal failure?

- 1- bendroflumethiazide
- 2- improve glycaemic control with HbA1c <7%
- 3- lisinopril
- 4- simvastatin
- 5- stop smoking

Answer & Comments

Answer: 3- lisinopril

This patient has diabetic nephropathy with marked proteinuria. To attenuate the progression towards end stage renal disease, stringent blood pressure control should be employed maintaining a BP less than 130/80 and an ACE inhibitor would probably offer even greater reno-protection than any other anti-hypertensive. Simvastatin has no proven benefit on renal disease and improved glycaemic control although of benefit would be of less benefit than BP control (UKPDS/DCCT trials). Again stopping smoking would probably be of greatest benefit to her with regard to reducing cardiovascular risk but would not itself offer any reno-protective effect.



[Q: 758] OnExamination - Endocrinology

A 45-year-old female attends the diabetic annual review clinic. Her body mass index has increased over the year to 33.3.

How do you calculate body mass index?

- 1- Height/Weight
- 2- Height/(Weight) 2
- 3- Weight/Height
- 4- Weight/(Height) 2
- 5- Weight/? Height

Answer & Comments

Answer: 4- Weight/(Height)2

BMI is one of the most important calculations of anthropometry, is calculated as weight over (height) squared and measured in kg/m². BMI can be defined as underweigh (less than 18.5), normal (18.5-24.9), overweight (25-29.9) and obese. A BMI above 30 diagnoses obesity and has prognostic value indicating increased propensity to develop diabetes, cancer, osteoarthritis and depression.



[Q: 759] OnExamination - Endocrinology

A 33-year-old type 1 diabetic male presents with a two day history of pain in his left hand, fever and a rash. This began after he pricked his finger in the garden whilst pruning a bush. His diabetic control has been quite reasonable with a HbA1c of 7.1% on basal bolus insulin consisting of Lispro tds and Humulin I in the evenings. On examination he has a painful, red and swollen middle finger with the redness extending to the metacarpophalangeal joint. He is diagnosed with cellulites and is prescribed antibiotics.

What is the most likely infective organism?

- 1- Escherichia coli
- 2- Klebsiella
- 3- MRSA
- 4- Pseudomonas aeruginosa
- 5- Streptococcus pyogenes

Answer & Comments

Answer: 5- Streptococcus pyogenes

This patient has a community-acquired cellulitis which is most likely due to either strep or Staphylococcus aureus (not MRSA which is more of a hospital pathogen and tends not to cause cellulitis). Understanding the likely infective organism can therefore dictate appropriate antibiotic therapy. In this

case oral flucloxacillin and Pencillin V are appropriate. If the cellulitis does not quickly improve then intravenous antibiotics may be required.



[Q: 760] OnExamination - Endocrinology

A 53-year-old male presents with a 3 month history of polyuria with polydipsia.

Which of the following measurements would confirm a diagnosis of diabetes mellitus?

- 1- A fasting plasma glucose of 6.5 mmol/l
- 2- A fasting plasma glucose of 7.5 mmol/l
- 3- A plasma glucose of 10 mmol/l at the end of an oral glucose tolerance test
- 4- A random glucose of 10.5 mmol/l
- 5- A urine dipstick analysis showing +++ glucose

Answer & Comments

Answer: 2- A fasting plasma glucose of 7.5 mmol/l

Diabetes Mellitus is diagnosed on the basis of symptoms plus a random glucose above 11.1 mmol/l or fasting plasma glucose above 7 mmol/l or the two hour oral glucose tolerance test. Impaired glucose tolerance would be indicated by a post OGTT plasma glucose between 7.7 and 11.1 or a fasting plasma glucose between 6.1 and 7.



[Q: 761] OnExamination - Endocrinology

A 59-year-old woman has had insulin dependent diabetes mellitus for over two decades. The degree of control of her disease is characterized by the laboratory finding of a HbA1c of 10.1%. She complains of repeated episodes of abdominal pain following meals. These episodes have become more frequent and last for longer periods over the last couple of months.

On physical examination, there are no abdominal masses or organomegaly and no tenderness to palpation.

Which of the following findings is most likely to be present?

- 1- Acute pancreatitis
- 2- Chronic renal failure
- 3- Hepatic infarction
- 4- Mesenteric artery occlusion
- 5- Ruptured aortic aneurysm

Answer & Comments

Answer: 4- Mesenteric artery occlusion

Diabetes- especially Type 2 diabetes- is associated with macrovascular disease. Smoking is a further risk factor for macrovascular atherosclerosis. After a meal splanchnic blood flow is increased. If the mesenteric artery is occluded the lack of blood flow to the bowel will produce ischaemic type pain. Chronic renal failure may be present but would not cause post prandial pain. Ruptured aortic aneurysm would normally present acutely with hypotension, cold lower limbs with reduced pulses and a pulsatile, tender abdominal mass. Pancreatitis is unlikely given the history and the lack of epigastric tenderness. Hepatic infarction should lead to right upper quadrant pain.



[Q: 762] OnExamination - Endocrinology

A 17-year-old girl is admitted with a 2 day history of rigors due to a urinary tract infection. On examination she appears unwell, has a Body Mass Index of 31 kg/m², a temperature of 39°C; examination is otherwise normal.

Initial biochemistry revealed:

Potassium 4 mmol/L (3.5-5)

Urea 7 mmol/L (2.5-7)

Glucose 33 mmol/L (3.0-6.0)

pH 7.3 (7.36-7.44)
 Standard bicarbonate 14 mmol/l
 Base deficit -10
 urinalysis negative for ketones

Which one of the following is the best initial treatment for her hyperglycaemia?

- 1- Metformin
- 2- Metformin plus Gliclazide
- 3- Rosiglitazone
- 4- Sliding scale IV insulin infusion
- 5- Subcutaneous insulin mixture

Answer & Comments

Answer: 4- Sliding scale IV insulin infusion

This patient has a metabolic acidosis with pH of 7.3 and low bicarbonate likely due to sepsis. She is likely to be a type 2 diabetic, given the BMI, with uncontrolled hyperglycaemia but is unlikely to have classical diabetic ketoacidosis because the urine is negative for ketones.

It is important that her glycaemia is controlled to promote recovery from the sepsis. This is best achieved with intravenous insulin initially.



[Q: 763] OnExamination - Endocrinology

A 60-year-old lady with dyslipidaemia, hypertension and angina has recently been diagnosed with impaired glucose tolerance. Clinically she is obese with a BMI of 32 kg/m², her blood pressure is 140/80mmHg. She is aware that having impaired glucose tolerance is a risk factor for type 2 diabetes and would like to discuss strategies to attenuate this risk.

Which of the following has been shown to best reduce the incidence of type 2 diabetes in individuals with IGT?

- 1- Acarbose 100mg tds
- 2- Gliclazide
- 3- Intensive lifestyle change

- 4- Metformin 850mg bd
- 5- Pioglitazone 15mg daily

Answer & Comments

Answer: 3- Intensive lifestyle change

Both the diabetes prevention programme (DPP) and Finnish diabetes prevention study showed a 58% reduction in incidence of type 2 diabetes after intervention which involved intensive dietary change, increased physical activity and weight loss.

This compares with a 31% reduction in incidence when metformin was used. Acarbose has also been shown to reduce the incidence of diabetes in combination with lifestyle change when compared with Placebo. There is evidence that the thiazolidinedione Rosiglitazone has been shown to reduce the incidence of type 2 diabetes in individuals with pre diabetes when the Dream study was published in 2006. Currently this is not licensed in the UK for diabetes prevention.



[Q: 764] OnExamination - Endocrinology

A 32-year-old lady presented with episodes of polydipsia and polyuria for the last 6 months.

Investigations:

serum urea 8.1 mmol/L (2.5-7.5)
 serum creatinine 92 mol/L (60-110)
 serum corrected calcium 2.85 mmol/L (2.2-2.6)
 serum phosphate 0.75 mmol/L (0.81-4)
 plasma parathyroid hormone 6.2 pmol/L (0.9-5.4)

Which of the following is directly responsible for his increased reabsorption of calcium in the distal tubule of the kidney?

- 1- 1,25 dihydroxy vitamin D
- 2- 25 hydroxy vitamin D
- 3- calcitonin

4- hypophosphatemia

5- parathyroid hormone

Answer & Comments

Answer: 5- parathyroid hormone

This patient has hypercalcaemia due to hyperparathyroidism. Parathyroid hormone has a number of direct effects: enhancing the release of calcium from bones by binding to osteoblasts which stimulates the formation of osteoclasts, and enhances reabsorption of calcium in the distal tubules.



[Q: 765] OnExamination -
Gastroenterology

A 75-year-old male presents with a two month history of dyspnoea, weight loss and generalised lethargy. Past medical history included a previous left-sided hemiparesis due to stroke for which he took aspirin and perindopril.

Examination revealed residual left sided hemiparesis together with a pale and slightly jaundiced appearance.

Investigations show:

Haemoglobin 5 g/dL (13-16.5)

MCV 109 fL (80-96)

White cell count $2 \times 10^9/L$ (4-11)

Platelets $45 \times 10^9/L$ (150-400)

Urinalysis: Increased urobilinogen

What is the next most appropriate investigation?

- 1- Bone marrow aspirate
- 2- Direct antiglobulin test
- 3- Endoscopy
- 4- Serum haptoglobins
- 5- Vitamin B₁₂ concentration

Answer & Comments

Answer: 5- Vitamin B₁₂ concentration

In this situation, Serum B12 estimation is the correct choice. With a pancytopenic picture and raised MCV, the most appropriate step is to check the B12 and folate. The other choices are considered only after the basic assays. Haemolysis does not explain the low WCC, nor the thrombocytopaenia. A haptoglobin only adds weight to a diagnosis of haemolysis, and a RBC-labelled scan would add greater sensitivity to the diagnosis of haemolysis.

The mild jaundice is typical of megaloblastic anaemia (Vitamin B₁₂ or folate deficiency)

because of increased destruction of red cell precursors in the bone marrow.



[Q: 766] OnExamination -
Gastroenterology

A male teacher who is 31 years of age, attends clinic with his partner who tells you that he has memory problems. The only other symptom is intermittent diarrhoea over the preceding 4 months. He has limited vertical eye movements and exhibits rhythmic simultaneous eye and mouth movements.

Which pathogen is most likely to be the cause of his symptoms?

- 1- Clostridium botulinum
- 2- HIV
- 3- Prion protein
- 4- Salmonella enteritidis
- 5- Tropheryma whippelii

Answer & Comments

Answer: 5- Tropheryma whippelii

This is a tough question. The suggestion here is that the patient has Whipple's disease, due to intestinal infection with Tropheryma Whippelii. Non neurological manifestations of Whipple's disease are more common and include chronic diarrhoea, malabsorption with steatorrhoea and associated abdominal distension and tenderness. Neurological manifestations involve a chronic, progressive, impairment of higher mental function in association with seizures, myoclonus ataxia and oculomasticatory myorhythmia found uniquely in Whipple's. The diagnosis is made by duodenal or jejunal biopsy and demonstrating the bacilli within the mucosa on PAS staining. Characteristically, there is accumulation of glycoprotein and fat filled (PAS +ve) macrophage within the lamina propria. Botulism does not produce this clinical picture. An AIDS related dementia is possible, but abnormal facial movements

would be unusual. CJD could also produce this picture, although myoclonus is usually more of a feature and cognitive impairment is more generalised and acute. Salmonella enteritidis usually causes only an acute diarrhoeal illness, but may lead to bacteraemia and chronic long-term carriage and excretion.



[Q: 767] OnExamination -
Gastroenterology

A 19-year-old student presents with weight loss and blood loss per rectum. You organise a flexible sigmoidoscopy.

Which of the following histological features would favour a diagnosis of Crohn's disease and not ulcerative colitis?

- 1- Crypt abscesses
- 2- Metaplastic polyp formation
- 3- Goblet cell mucus depletion
- 4- Lymphocyte infiltrate of the lamina propria
- 5- Caseating granulomata

Answer & Comments

Answer: 4- Lymphocyte infiltrate of the lamina propria

Ulcerative colitis is characterised by mucosal inflammation with general inflammatory cell infiltration, goblet-cell mucus depletion, crypt abscesses, crypt shortening and branching. There is continuous inflammation, worsening from caecum to rectum. In contrast, Crohn's disease is characterised by transmural inflammation, with neutrophil infiltrates and lymphoid aggregates, fissures, preservation of crypt architecture, and non-caseating granulomata. There is patchy inflammation from mouth to anus.



[Q: 768] OnExamination -
Gastroenterology

A 30-year-old woman presents with jaundice and her investigations reveal:

Haemoglobin 9.0 g/dL (11-16)

reticulocyte count $180 \times 10^9/L$ (25-85)

serum bilirubin 50 $\mu\text{mol/L}$ (1-20)

Her blood film reveals the presence of spherocytes.

Which of the following is the next most useful investigation?

- 1- abdominal ultrasound scan
- 2- direct antiglobulin test
- 3- glucose-6-phosphate dehydrogenase activity
- 4- haemoglobin electrophoresis
- 5- red cell osmotic fragility

Answer & Comments

Answer: 2- direct antiglobulin test

The results given indicate a haemolytic anaemia of which spherocytes are typical and given the age of patient the most likely cause is immune. Therefore the most useful test is the Direct Antiglobulin Test.



[Q: 769] OnExamination -
Gastroenterology

A 30-year-old caucasian male presents with a six month history of weight loss, abdominal pain, and diarrhoea. On examination you note finger clubbing.

Which of the following diagnoses is least likely.

- 1- Crohn's disease
- 2- Ulcerative colitis
- 3- Coeliac disease
- 4- Whipple's disease
- 5- Ileocaecal TB

Answer & Comments

Answer: 5- Ileocaecal TB

Ileo-caecal TB is the only condition mentioned not associated with clubbing and would be very rare in a young caucasian in the UK.



[Q: 770] OnExamination -
Gastroenterology

A 45-year-old woman is diagnosed with a duodenal ulcer.

Which one of the following is the most sensitive test for detecting current infection with Helicobacter pylori?

- 1- A gastric fundal biopsy.
- 2- Culture of a gastric biopsy.
- 3- The (13C) urea breath test.
- 4- The presence of Helicobacter pylori serum antibodies.
- 5- The urease test on gastric biopsy.

Answer & Comments

Answer: 3- The (13C) urea breath test.

The gold standard for diagnosis of H. pylori remains culture of a gastric biopsy. Yet this test is only 72% sensitive. However, the rapid Urease test on a biopsy is 80-95% sensitive and 95-100% specific. Histology is 80-90% sensitive and 95% specific. However, the urease breath test is approximately 95% sensitive and 98-100% specific. Therefore the most specific and clinically applicable would be the urease breath test. The presence of IgG antibodies to H. pylori could indicate previous infection. A gastric antral biopsy can give false negative results following PPI treatment.



[Q: 771] OnExamination -
Gastroenterology

Which of the following is true of Spontaneous bacterial peritonitis?

- 1- A survival rate of over 50% is expected at one year
- 2- Gentamicin is the treatment of choice

- 3- is characteristically caused by aerobic bacteria.
- 4- is diagnosed by culture of ascitic fluid.
- 5- is due to intestinal perforation

Answer & Comments

Answer: 3- is characteristically caused by aerobic bacteria.

SBP is a frequent complication of the ascites of cirrhosis. It is diagnosed by ascitic fluid examination which reveals a PMN count of >250/ml. SBP has poor prognostic significance with a one year survival after a diagnosis of between 30-50%. It is, as the name suggests a spontaneous event that is not a consequence of intestinal perforation. It is speculated that the infective organism may leak into the ascitic fluid via the blood or from intestinal overgrowth. Organisms should be cultured by directly collecting into blood culture bottles. It is typically caused by aerobic Gram negative bacteria. Hence Cefotaxime is regarded as the drug of choice for treatment.



[Q: 772] OnExamination -
Gastroenterology

A 52-year-old male is admitted with vomiting and acute epigastric abdominal pain which radiates through to his back. Investigations confirm severe acute pancreatitis.

Which of the following figures most accurately reflect the mortality associated with severe acute pancreatitis?

- 1- Less than 5%
- 2- Approximately 10%
- 3- Approximately 20%
- 4- Approximately 30%
- 5- Approximately 40%

Answer & Comments

Answer: 3- Approximately 20%

Mortality in acute pancreatitis varies according to age, co-morbidities and severity and is scored through the Ranson scoring system. However, average mortality has remained pretty much unchanged over the last two decades with severe disease and is approximately 20%.



[Q: 773] OnExamination - Gastroenterology

Which of the following is correct regarding infection with Salmonella typhi

- 1- children are particularly likely to become carriers
- 2- most carriers are female
- 3- faecal culture is almost always positive during the first week of illness
- 4- relapse does not occur if antibiotics are taken for 2 weeks
- 5- vaccinated individuals who develop the disease will have a mild illness

Answer & Comments

Answer: 2- most carriers are female

Children are rarely chronic carriers of the organism although for some unknown reason females are more commonly long-term carriers than males (Remember Typhoid Mary).

C-only 50% of cases

E-higher threshold but same disease.



[Q: 774] OnExamination - Gastroenterology

A patient is referred to hepatology department for possible treatment of Hepatitis B. He has stigmata of chronic liver disease. There is portal hypertension and ascites. His INR is 2.2 and albumin 25g/L. HBsAg and HBeAg positive. Hepatitis C screen is negative.

What will you suggest for treatment?

- 1- Beta interferon
- 2- Lumivudine alone
- 3- Lumivudine plus interferon
- 4- Ribavirin alone
- 5- Ribavirin plus interferon

Answer & Comments

Answer: 2- Lumivudine alone

Ribavirin is used for Hepatitis C infection. Its combination with interferon confers more success in treating HCV infection. Interferon cannot be used in this case as it can initially worsen hepatic decompensation. Lumivudine alone is safe in decompensated HBV infection.



[Q: 775] OnExamination - Gastroenterology

Which of the following is true of Gilbert's syndrome?

- 1- inheritance is autosomal dominant
- 2- serum conjugated bilirubin levels are elevated
- 3- serum bilirubin levels are decreased by fasting
- 4- serum bilirubin levels are decreased by liver enzyme inducers
- 5- there is bilirubinuria

Answer & Comments

Answer: 4- serum bilirubin levels are decreased by liver enzyme inducers

Gilbert's syndrome is inherited in autosomal recessive fashion and affects 2-5% of the population. UDP glucuronyl transferase levels are reduced leading to an unconjugated hyperbilirubinaemia.

Whilst serum bilirubin levels are elevated the other LFTs are normal. Jaundice deepens after a period of fasting or intercurrent illness but

bilirubin levels are reduced by enzyme inducers such as phenobarbitone.

As unconjugated bilirubin is tightly bound to albumin it cannot cross the glomerulus and so is not found in the urine. This contrasts with the bilirubin-glucuronide-albumin complex formed in patients with cholestatic jaundice (and raised conjugated bilirubin levels) where 1% of the complex is dialysable and although most of the bilirubin is reabsorbed in the proximal tubule some bilirubin is detectable in the urine.



[Q: 776] OnExamination - Gastroenterology

An 81-year-old frail ضعيف man admitted with a stroke becomes increasingly drowsy after receiving nasogastric feeding for five days.

Which biochemical abnormality is the most likely cause of his drowsiness?

- 1- hyperglycaemia
- 2- hypermagnesaemia
- 3- hypernatraemia
- 4- hypocalcaemia
- 5- hypophosphataemia

Answer & Comments

Answer: 5- hypophosphataemia

The chronology of his presentation 5 days after receiving NG feeds suggests hypophosphataemia associated with the re-feeding syndrome. This is well described in elderly frail subjects who may have prior poor nutrition. However, other electrolyte abnormalities are also described in associated with NG feeds eg Hypermagnesaemia. But with this briefest of histories and the five days I suspect the examiner is looking for hypophosphataemia.



[Q: 777] OnExamination - Gastroenterology

A 75-year-old patient presents with watery diarrhoea. He is passing large volumes of watery diarrhoea, approximately 3litres a day, with no noticeable blood. It has been present for approximately 5 months and is gradually becoming more frequent. It often wakes him at night with the urge to defecate.

Liver function tests, calcium and urea and electrolytes are normal.

Stool microscopy and culture are normal, and clostridium difficile toxin is negative.

A flexible sigmoidoscopy is organised, and the investigator reports to you that the large bowel appears normal.

Which of the following treatments may this patient benefit from?

- 1- Gluten free diet
- 2- High fibre diet
- 3- Low residue diet
- 4- Oral cholestyramine
- 5- Oral prednisolone

Answer & Comments

Answer: 4- Oral cholestyramine

In the absence of infection and with this typical history in an elderly individual the diagnosis is likely to be microscopic colitis. This does not fulfil the ROME II criteria for IBS. Although Coeliac disease is a possibility, this is unlikely, given the patients age, and the presentation.

Microscopic colitis can only be diagnosed by colonoscopy and mucosal biopsy because, macroscopically, the colon appears normal. The incidence is increasing as the use of colonoscopy increases - almost certainly due to better diagnostic workup. Microscopic colitis is diagnosed in up to 10% of all patients undergoing colonoscopy for unexplained diarrhoea, an incidence which increases to

20% in those aged over 70 years. Microscopic colitis may be associated with bile acid malabsorption and may respond to either budesonide or cholestyramine.



[Q: 778] OnExamination -
Gastroenterology

With respect to liver cirrhosis which of the following statements is correct?

- 1- In end-stage cirrhosis, liver transplantation is associated with 20% 5 year survival
- 2- The final common pathway of hepatic fibrosis is mediated by the hepatic stellate cell
- 3- Tumour necrosis factor is an anti-inflammatory effector in fibrotic liver injury
- 4- Transforming growth factor is a potent promoter of the fibrogenic response by hepatocytes
- 5- Endothelin causes dilatation of the sinusoids, thus decreasing portal hypertension

Answer & Comments

Answer: 2- The final common pathway of hepatic fibrosis is mediated by the hepatic stellate cell

The hepatic stellate cells, which reside in the space of Disse are central to the process of fibrosis within the liver. Tumour necrosis factor- is a pro-inflammatory effector in fibrotic liver injury, through activation of the stellate cells, which then secrete the fibrillar collagen, constituting the defining features of hepatic fibrosis. Interleukin-10 is thought to exert anti-inflammatory effects on the stellate cell. Endothelin is a vasoconstrictor in the hepatic sinusoids (similarly in the endothelium of the systemic circulation), and functions by causing contraction of the hepatic stellate cells, thus increasing intrahepatic sinusoidal resistance, and promoting portal hypertension. Nitric Oxide antagonises the

effects of endothelin in the liver. 5 year survival after liver transplantation is now 75%. For an update on liver cirrhosis refer to BMJ 2003;327:143-7.



[Q: 779] OnExamination -
Gastroenterology

A 17-year-old girl is commenced on nasogastric feeding due to severe anorexia nervosa. Five days later she becomes increasingly confused.

On examination she was afebrile, appeared appropriately hydrated, with a pulse of 98 bpm and blood pressure 96/60 mmHg.

Which one of the following investigations should be requested forthwith?

- 1- Arterial blood gases
- 2- Phosphate
- 3- Serum Calcium
- 4- Serum Magnesium
- 5- Vitamin B concentrations

Answer & Comments

Answer: 2- Phosphate

The patient appears to have developed the refeeding syndrome. Refeeding malnourished patients increases basal metabolic rate, with glucose being the predominant energy source. This anabolic response causes intracellular movement of minerals, and serum levels may fall significantly. These rapid changes in metabolism and electrolyte movement may lead to severe cardiorespiratory and neurological problems resulting in cardiac and respiratory failure, oedema, lethargy, confusion, coma, convulsions, and death. The symptoms of the refeeding syndrome are thought to be due predominantly to hypophosphataemia, but metabolic changes in potassium, magnesium, glucose, and thiamine can also contribute. The probable answer here is therefore phosphate as hypophosphataemia seems probable.

Calcium depletion is possible but there is absence of tetany.

Zinc deficiency causes skin rashes periorally and around nostrils. Its extremely difficult to measure vitamin B concentrations plus her presentation does not sound like Wernicke's ?neurophthalmological features.



[Q: 780] OnExamination - Gastroenterology

A 32-year-old man develops profuse diarrhoea with mucus and blood. Biopsies from the flexible sigmoidoscopy shows evidence of ulcerative colitis.

Which of the following is true of the condition?

- 1- mesalazine therapy is associated with infertility in males
- 2- pseudopolyps on sigmoidoscopic examination have premalignant potential
- 3- topical 5-aminosalicylic acid are less effective than topical steroids in proctitis
- 4- colectomy may produce regression of gall bladder disease
- 5- goblet cells are unaffected in the mucosa

Answer & Comments

Answer: 4- colectomy may produce regression of gall bladder disease

Mesalazine is 5-aminosalicylic acid. Sulphasalazine is the combination of 5-ASA and sulphapyridine, the latter being a sulphonamide and causing oligospermia. Pseudopolyps are not premalignant and may occasionally regress. Topical 5-aminosalicylic acid are as effective as topical steroids in proctitis. Goblet cells are depleted in the mucosa.



[Q: 781] OnExamination - Gastroenterology

Which of the following statements regarding the genetic and immunological basis of Coeliac

Disease is correct?

- 1- 50% of patients are HLA-DQ 2 or HLA-DQ 8 positive.
- 2- alpha-gliadin specific CD8 cells can be identified in the intestinal wall of untreated patients with coeliac disease
- 3- Cow's milk proteins may precipitate an immune-related enteropathy indistinguishable from coeliac disease.
- 4- Tissue Transglutaminase generates the antigenic epitopes present in alpha-gliadin.
- 5- TNF- γ plays a critical role in the inflammatory response in the intestinal wall of patients with untreated celiac disease.

Answer & Comments

Answer: 4- Tissue Transglutaminase generates the antigenic epitopes present in alpha-gliadin.

The prevalence of Coeliac Disease is 1% in Western societies, and is thus one of the commonest immune-mediated diseases. It arises as a result of genetic predisposition, at least 95% of patients are HLA-DQ2 or HLA-DQ8 positive, and the specific immune response to the alpha-gliadin component of gluten. The action of tissue transglutaminase on alpha-gliadin generates epitopes to CD4+ T-lymphocytes, which provoke an inflammatory response in the intestinal wall. In untreated individuals, alpha-gliadin specific CD4+ T cells can be found producing interferon- γ in the intestinal wall. Cow's milk can produce an immunologically mediated enteropathy, but the condition is rare and transient.



[Q: 782] OnExamination - Gastroenterology

Which of the following statements concerning iron metabolism is correct?

- 1- Approximately 0.1% of body iron circulates in the plasma
- 2- Approximately 90% of dietary iron is absorbed in the intestine
- 3- The main route of excretion is the liver
- 4- The serum ferritin concentration is reduced characteristically following surgery
- 5- The transferrin content of intestinal mucosal cells is high when body iron stores are high

Answer & Comments

Answer: 1- Approximately 0.1% of body iron circulates in the plasma

Approximately 4mg of iron circulate within the plasma with a total body iron store of 3-4 g (2500 mg in the RBCs, 500mg in liver, 500 mg in macropahages and about 500 mg in muscle). From an intake of approx 6mg/1000kcal of dietary iron only 15% is bioavailable. The majority of iron contained within the RBCs is metabolised and re-utilised but 1mg per day is lost through the gut. Ferritin, the plasma protein responsible for binding iron is an acute phase reactant protein and increases in inflammatory conditions and following surgery. Transferrin is a glycoprotein responsible for internal ion exchange and the content within mucosal cells is naturally low in haemochromatosis with high saturation.



[Q: 783] OnExamination - Gastroenterology

A 46-year-old man with a family history of haemochromatosis presented to outpatients for advice.

Investigations revealed.

serum ferritin 453ug/L (15-300)

serum iron 29 umol/L (12-30)

serum iron binding capacity 46 umol/L(45-75)

iron saturation 63 per cent (20-50)

What is the most appropriate next step in management?

- 1- arrange for DNA analysis
- 2- begin a venesection programme
- 3- monitor his serum ferritin regularly
- 4- take no action unless the iron saturation exceeds 90 per cent
- 5- undertake a liver biopsy

Answer & Comments

Answer: 1- arrange for DNA analysis

This man is likely to have hereditary heamochromatosis (HHC). Homozygous mutation (C282Y mutation) of the Human Iron gene (HFE gene) accounts for over 80% of cases of HHC. The diagnosis is made on DNA analysis. If the diagnosis is confirmed then treatment with venesection to achieve and maintain a ferritin of 50-100?/l is indicated. A liver biopsy is not required to make the diagnosis of HHC although may be indicated for prognostic reasons if cirrhosis is suspected.



[Q: 784] OnExamination - Gastroenterology

Which of the following conditions may give a false/positive sweat test?

- 1- Conn syndrome
- 2- Hyperthyroidism
- 3- Hyperparathyroidism
- 4- Obesity
- 5- Glucose-6-phosphatase dehydrogenase deficiency

Answer & Comments

Answer: 5- Glucose-6-phosphatase dehydrogenase deficiency

Non-cystic fibrosis conditions associated with elevated concentrations of sweat electrolytes include:

" Endocrine: Untreated adrenal insufficiency, hereditary nephrogenic diabetes insipidus, hypothyroidism, hypoparathyroidism.

" Metabolic: Glucose-6-phosphate dehydrogenase deficiency, mucopolysaccharidoses, fucosidosis.

" Other: Ectodermal dysplasia, familial cholestasis, pancreatitis, malnutrition.



[Q: 785] OnExamination - Gastroenterology

A middle-aged woman presents with recent changes in bowel habit. She is investigated as a case of sporadic colonic carcinoma.

What is the mechanism of its tumorigenesis?

- 1- APC gene mutation
- 2- β -catenin suppression
- 3- Down-regulation of p27
- 4- K-ras suppression
- 5- p53 upregulation

Answer & Comments

Answer: 3- Down-regulation of p27

The cyclin-dependent kinase inhibitor p27 is a negative regulator of the cell cycle and a potential tumour suppressor gene. Its down-regulation is associated with occurrence of sporadic colon cancer. β -catenin accumulation, not suppression, initiates adenoma formation. p53 is a tumour suppressor gene. Activation of K-ras oncogene is seen in sporadic colon cancer.



[Q: 786] OnExamination - Gastroenterology

A 48-year-old man with malaise and abdominal pain is found to have a raised serum bilirubin of 60 μ M. The provocation test with intravenous nicotinic acid is positive.

What is the best course of action?

- 1- Corticosteroid
- 2- Sphincterotomy with endoscopic retrograde cholangiopancreatography (ERCP)
- 3- Cholestyramine
- 4- Reassure patient
- 5- Ursodeoxycholic acid

Answer & Comments

Answer: 4- Reassure patient

This patient has Gilbert's syndrome, which is a familial mild unconjugated hyperbilirubinaemia with an excellent prognosis. It is probably autosomal dominant. There are a number of abnormalities with bilirubin handling including hepatic uptake and conjugation. Investigations show a rise in unconjugated bilirubin on fasting, or by nicotinic acid. Reassure patient that condition is common and benign.



[Q: 787] OnExamination - Gastroenterology

With respect to gastric carcinoma, which of the following statements is true?

- 1- Incidence of distal stomach tumours is increasing
- 2- Aspirin use is a risk factor for gastric carcinoma
- 3- Helicobacter pylori infection is not associated with gastric carcinoma
- 4- Endoscopic ultrasonography is superior to conventional CT scanning for local tumour staging
- 5- Early diagnosis of gastric carcinoma results in a 5 year survival rate of 20%

Answer & Comments

Answer: 4- Endoscopic ultrasonography is superior to conventional CT scanning for local tumour staging

Incidence of distal stomach tumours is actually decreasing while the incidence of tumours in the proximal stomach is increasing. NSAID use is associated with decreased risk of certain gastric tumours. H. pylori infection has been associated in a number of studies with increased risk of gastric carcinoma. Screening for gastric carcinoma in Japan detects up to 40% of gastric carcinomas at an early stage, and, in skilled hands 5 year survival can be upwards of 90%. CT with gastric dilatation is an useful complementary investigation in the staging of gastric carcinoma, but endoscopic ultrasonography is superior to conventional CT scanning as it is able to assess depth of infiltration and lymphatic dissemination of tumour.



[Q: 788] OnExamination -
Gastroenterology

A 29-year-old male presents with symptoms of severe gastro-oesophageal reflux.

Which one of the following is most useful in assessing the role of surgery?

- 1- cardiac sphincter manometry
- 2- gastric emptying study
- 3- intragastric pH monitoring off therapy
- 4- oesophageal motility study
- 5- oesophageal pH monitoring on therapy

Answer & Comments

Answer: 4- oesophageal motility study

Laparoscopic fundoplication is the treatment of choice for patients with GORD refractory to or intolerant of, Proton Pump Inhibitor therapy. The patient should have had an endoscopy at least 6 months prior to surgery to exclude any unsuspected pathology ?Barrett's oesophagus or adenocarcinoma. An oesophageal transit study is indicated to rule out a primary motor disorder (eg achalasia, scleroderma) when suspected and to rule out aperistalsis, which may result in post-

operative dysphagia after some forms of fundoplication.



[Q: 789] OnExamination -
Gastroenterology

A 60-year-old man presents with a 5 day history of lower abdominal pain and diarrhoea. He has a history of chronic obstructive airways disease and has had numerous acute infective exacerbations over the last 3 months.

On examination he was dehydrated, with a temperature of 38.6 C, a blood pressure of 102/72 mmHg and has a distended, tender abdomen.

Which of the following is the most appropriate investigation for this patient?

- 1- Chest X-ray
- 2- Plain abdominal X-ray
- 3- Sigmoidoscopy and biopsy
- 4- Stool microscopy
- 5- Ultrasound scan of the abdomen

Answer & Comments

Answer: 2- Plain abdominal X-ray

This is pseudomembranous colitis due to Clostridium Difficile secondary to Antibiotic usage for his COAD. Plain AXR is useful for diagnosing toxic dilatation and would be the investigation of choice here due to his abdominal distension. So toxic dilatation should be excluded prior to sigmoidoscopy. However it does not establish the diagnosis. Stool microscopy has no value but stool toxin assay is useful. A Patient with diarrhoea normally has involvement of the distal colon and rectum and sigmoidoscopy with biopsy is helpful for rapid diagnosis but should not be performed if toxic dilatation is suspected. Patients with involvement of right colon usually have little or no diarrhoea.



[Q: 790] OnExamination -
Gastroenterology

49-year-old woman presents with a 6 month history of pruritus. Examination reveals jaundice, xanthelasma, scratch marks, vitiligo and 3cm hepatomegaly. She was afebrile. Liver function tests reveal raised bilirubin, alkaline phosphatase, gamma glutamyl transferase and mildly elevated alanine transaminase and aspartate transaminase.

Which of the following conditions will be most likely found in this woman?

- 1- Constipation
- 2- Haemolysis
- 3- Lymphadenopathy
- 4- Vitamin A deficiency
- 5- Vitamin B complex deficiency

Answer & Comments

Answer: 4- Vitamin A deficiency

The most likely diagnosis is primary biliary cirrhosis as evidenced by pruritus, hypercholesterolaemia, jaundice, raised ALP and γ -GT. Malabsorption of fat-soluble vitamins (A, D, K) is common.



[Q: 791] OnExamination -
Gastroenterology

A new diagnostic test for malabsorption has been analysed and the results have yielded the following 2x2 contingency table.

	Disease present	
	Yes	No
+ve test	0.9	0.1
-ve test	0.2	0.8

Applying this test to a case of chronic diarrhoea from a patient group where the prevalence of malabsorption is known to be 20% (probability = 0.2)

What is the probability of a patient having malabsorption if they have a positive test?

- 1- 0.16
- 2- 0.24
- 3- 0.48
- 4- 0.64
- 5- 0.8

Answer & Comments

Answer: 4- 0.64

This is tough but the College are putting more and more Evidence Based Medicine Questions into the exam. This question tests understanding of pre-test and post-test odds, likelihood ratios, sensitivity and specificity. The calculation is as follows.

$$\text{Sensitivity} = 0.9 / (0.9 + 0.2) = 0.818$$

$$\text{Specificity} = 0.8 / (0.1 + 0.8) = 0.889$$

$$\text{Likelihood ratio for a positive test (LR+)} = 0.818 / (1 - 0.889) = 7.2$$

$$\text{Pre-test odds} = 0.2 / (1 - 0.2) = 0.25$$

$$\text{Post-test odds} = \text{pre-test odds} \times \text{LR+} = 0.25 \times 7.2 = 1.8$$

$$\text{Post-test probability} = 1.8 / (1.8 + 1) = 0.64$$

		Disease present	
		Yes	No
test	result	true positive (A)	false positive (B)
test	result – ve	false negative (C)	true negative (D)

Sensitivity (how much a test is positive in disease) = $A / (A + C)$

Specificity (how much a test is negative in health) = $D / (B + D)$

$$\text{Positive Predictive Value} = A / (A + B)$$

$$\text{Negative Predictive value} = D / (C + D)$$

Pre-test odds = the odds of having the disease before you do the test (e.g. your rule-of-thumb guestimate or the prevalence of the disease in the population or based on clinical findings etc.)

Post-test odds = the odds of having the disease after you did the test

Systematic Error = $(A + B) / (A + C)$ = good statistic for - 1) breaking the ice at a party of epidemiologists, 2) confusing your fellow SpRs at meetings

Likelihood Ratio (LR) + (the ratio of the chance of having a +ve test if the disease is present to the chance of having a positive test if the disease is absent) = sensitivity / (1 - specificity)

LR- = $(1 - \text{sensitivity}) / \text{specificity}$

WHAT? ... Aghh! I knew I hated stats. Of what use is an LR?

Likelihood Ratios are good for

" directly calculating post-test odds

" tests with multiple levels (i.e. not just +ve or -ve). Calculate the LR at each level by taking the ratio of true +ves to false +ves both expressed as percentages of the total number tested.

" diseases requiring multiple tests. The post-test odds after one test is the pre-test odds for the next.

" bluffing your way in statistics, especially when talking to Evidence Based Medicine boffins



[Q: 792] OnExamination - Gastroenterology

Which of the following statements regarding lactose intolerance is correct?

- 1- Lactose is degraded to glucose and fructose by lactase
- 2- Lactose intolerance is commonest in white Northern Europeans
- 3- Lactose intolerance is best diagnosed with a methane breath test
- 4- Rotavirus infection may precipitate the diagnosis of lactose intolerance

- 5- Lactose intolerance is treated by glucose and galactose replacement therapy

Answer & Comments

Answer: 4- Rotavirus infection may precipitate the diagnosis of lactose intolerance

Lactase acts on lactose to generate glucose and galactose. Lactose intolerance is least common in white northern Europeans, and is more common in Asian, and East Asian races. Lactose intolerance may be diagnosed with a DNA assay of the Lactase gene, along with a Hydrogen breath test. Any GI infection may reveal lactose intolerance, as gut flora may be altered by large bowel bacterial or viral load, as well as the treatment of infection. A change from an Eastern to a Western, high lactose, diet, may also reveal lactose intolerance. Many patients labelled as having IBS may suffer from undiagnosed lactose intolerance, and many medications use lactose as a binding and stabilising agent. Treatment of lactose intolerance is with careful replacement of lactase.



[Q: 793] OnExamination - Gastroenterology

A 43-year-old male presents with weight loss and watery diarrhoea. Investigations reveal hypokalaemia with a pancreatic mass.

Which of the following would support the diagnosis of a VIPoma?

- 1- Achlorhydria
- 2- Hypoglycaemia
- 3- Increased Pancreatic polypeptide
- 4- Migratory erythema
- 5- Pellagra

Answer & Comments

Answer: 1- Achlorhydria

Achlorhydria is classically associated with VIPoma together with profuse diarrhoea, a

hypokalaemic acidosis and hyperglycaemia. Migratory erythema is associated with a glucagonoma. Although raised pancreatic polypeptide is seen with a VIPoma it is unusual and is more commonly associated with its own syndrome. Pellagra is associated with the carcinoid syndrome.



[Q: 794] OnExamination - Gastroenterology

A 36-year-old man presents with a 16 week history of indigestion. Five years previously he had been treated for a duodenal ulcer. Investigations reveal:

Fasting gastrin 120 pmol/L (<55)

Which one of the following statements regarding gastrin is correct?

- 1- It acts upon the G cells of the stomach
- 2- It inhibits the secretion of pancreatic bicarbonate
- 3- It is produced by the alpha cells of the pancreatic islets
- 4- It is produced by the parietal cells of the stomach
- 5- Its release is stimulated by gastric luminal peptides

Answer & Comments

Answer: 5- Its release is stimulated by gastric luminal peptides

Gastrin is mainly produced in 2 forms by the G cells of the gastric antrum. It stimulates the parietal cells to produce hydrochloric acid and its production is stimulated by neural reflex pathways and also by the direct effect of digested peptides on the G cells themselves. It also stimulates the production of bicarbonate.



[Q: 795] OnExamination - Gastroenterology

A 70-year-old woman presented with a history of pancreatitis and persistent diarrhoea. She

also gave a history of osteoporosis and had had a deep vein thrombosis.

Which one of the following drugs will become less effective after she starts taking Cholestyramine to relieve intolerable itching?

- 1- Aspirin
- 2- Folic Acid
- 3- Thiamine
- 4- Vitamin D
- 5- Warfarin

Answer & Comments

Answer: 4- Vitamin D

Cholestyramine is an anion exchange resin, and will interfere with the absorption of fat-soluble vitamins. Thus vitamin D absorption will be reduced, making treatment with this drug less effective when given along with cholestyramine. Cholestyramine may enhance or reduce the anticoagulant effect of warfarin (see BNF).



[Q: 796] OnExamination - Gastroenterology

A 40-year-old single man returned from holiday in Europe with mild bloody diarrhoea which had lasted for two weeks. He had lost 2.5 kg in weight, had occasional lower abdominal cramping discomfort and a painful swelling of his left knee.

What is the most likely diagnosis?

- 1- amoebiasis
- 2- campylobacter infection
- 3- Crohn's disease
- 4- gonococcal septicaemia
- 5- ulcerative colitis

Answer & Comments

Answer: 2- campylobacter infection

Campylobacter infection is one of the commonest causes of inflammatory diarrhoea. Abdominal pain is often a prominent feature of the illness, frequently localising to the right iliac fossa, Diarrhoea may be mild or very severe, often with passage of blood. Symptoms may last a week or longer. Reactive arthritis and Reiter's syndrome can develop following infection with a number of enteric pathogens, including Shigella, Salmonella, Campylobacter and Yersinia.



[Q: 797] OnExamination -
Gastroenterology

A 65-year-old woman presented with a malabsorption syndrome. She had a past history of radiotherapy for cervical cancer. Small intestine biopsy reveals - villous atrophy and crypt hypertrophy, chronic inflammatory cell infiltrate of the lamina propria together with increase in intra-epithelial lymphocytes.

What is the most likely diagnosis?

- 1- Bacterial overgrowth
- 2- Coeliac disease
- 3- Crohn's disease
- 4- Mesenteric ischaemia
- 5- Radiation enteropathy

Answer & Comments

Answer: 2- Coeliac disease

Don't be put off by the description of the case, these histological features are typical of Coeliac disease with villous atrophy, crypt hyperplasia/hypertrophy, inflammatory infiltrate of the lamina propria and intra-epithelial lymphocytes. Useful serology includes anti-TTG antibodies which would be expected in over 90% of cases. Treatment of this case would therefore entail gluten-free diet.



[Q: 798] OnExamination -
Gastroenterology

A 52 year-old male presents with general deterioration. He drinks approximately 25 units of alcohol each week and is a smoker of 5 cigarettes daily. Examination reveals that he is jaundiced, has numerous spider naevi on his chest and he has a temperature of 37.2°C. Abdominal examination reveals hepatosplenomegaly.

Investigations reveal:

Bilirubin 200 micromol/L (1-22)
Alkaline phosphatase 550 iu/l (45 - 105)
AST 258 iu/l (1 - 31)
Albumin 25 g/L (37 - 49)
hepatitis B virus surface antigen positive
hepatitis B virus e antigen negative
hepatitis B virus DNA undetectable

What is the most likely diagnosis?

- 1- Alcoholic liver disease
- 2- Autoimmune chronic active hepatitis
- 3- Carcinoma of the pancreas
- 4- Chronic hepatitis B infection
- 5- Chronic hepatitis D (delta) infection

Answer & Comments

Answer: 4- Chronic hepatitis B infection

HbsAg is positive, Hepatitis E antigen is negative and the DNA being undetectable suggests that it is Chronic HBV infection with low viral replication.



[Q: 799] OnExamination -
Gastroenterology

A 78 year-old female with hip osteoarthritis presents with altered bowel habit. She undergoes a sigmoidoscopy and rectal biopsy shows normal epithelium and pigment-laden macrophages in the lamina propria.

What is the most likely cause of these findings?

- 1- Diverticular disease
- 2- laxative abuse
- 3- mesenteric ischaemia
- 4- Non-steroidal anti-inflammatory drugs
- 5- Ulcerative colitis

Answer & Comments

Answer: 2- laxative abuse

She has 'melanosis coli' as a result of prolonged laxative use. Often the bowel mucosa looks dark and 'stained' during colonoscopy. She may be predisposed to constipation due to immobility from her arthritis and/or use of constipating pain killers.



[Q: 800] OnExamination - Gastroenterology

A 45-year-old female develops profuse watery diarrhoea with lower abdominal pain 7 days after undergoing laparoscopic cholecystectomy.

What is the most likely diagnosis?

- 1- Abdominal sepsis
- 2- Bile acid diarrhoea
- 3- Campylobacter gastroenteritis
- 4- Pseudomembranous colitis
- 5- Pseudo-obstruction

Answer & Comments

Answer: 4- Pseudomembranous colitis

Prophylactic antibiotics are frequently given in both laparoscopic and open cholecystectomy. Typically broad spectrum antibiotics are administered with a consequent risk of Pseudomembranous colitis. However, it must also be remembered that Clostridium difficile may also be contracted on the wards.

Bile acid diarrhoea may affect 10% of patients following cholecystectomy. Typically it is post-prandial; the bile, with no gall bladder to store it, is excreted directly into the gut.



[Q: 801] OnExamination - Gastroenterology

A 55-year-old male is admitted with vomiting. He has a long history of alcohol abuse, appears slightly jaundiced and is dishevelled and unkempt. He was started on an intravenous glucose infusion and Diazepam and he symptomatically improved.

One day later he becomes confused, developed vomiting, diplopia and was unable to stand.

What is the most likely diagnosis?

- 1- Benzodiazepine intoxication
- 2- Delirium tremens
- 3- Hepatic encephalopathy
- 4- Subdural haematoma
- 5- Vitamin B deficiency

Answer & Comments

Answer: 5- Vitamin B deficiency

This patient is manifesting signs of Wernicke's encephalopathy with confusion, oculomotor signs and ataxia affecting gait and stance. Wernicke's encephalopathy is a medical emergency, requiring urgent intravenous thiamine.

The episode has been precipitated by intravenous dextrose administration which has exhausted his vitamin B reserves, hence B vitamins must be administered to all alcoholic patients requiring dextrose.



[Q: 802] OnExamination - Gastroenterology

A 53-year-old woman with rheumatoid arthritis was referred with iron deficiency

anaemia. Endoscopy revealed several superficial antral erosions, with small bowel biopsy showing mild villous blunting, apoptotic bodies, occasional eosinophils and mild increase in chronic inflammatory cells. Colonoscopy was reported as normal.

What is the most likely cause of these findings?

- 1- coeliac disease
- 2- Crohn's disease
- 3- non-steroidal anti-inflammatory drug therapy
- 4- small bowel lymphoma
- 5- Whipple's disease

Answer & Comments

Answer: 3- non-steroidal anti-inflammatory drug therapy

This salient features in this patient's case revolve around the fact that she has rheumatoid arthritis (hence the requirement for NSAIDs), the iron deficiency anaemia and the superficial ulceration on endoscopy with features indicative of inflammation due to the chronic NSAID use. Coeliac disease is associated with villous atrophy and lymphocyte infiltration. There is no suggestion on the biopsy of lymphocyte infiltration which argues against lymphoma or celiac.



[Q: 803] OnExamination - Gastroenterology

A 35-year-old woman with a history of recurrent anaemia was noted to have target cells and Howell-Jolly bodies on a blood film examination.

Investigations revealed:

Haemoglobin	7.0 g/dL (11.3-16.5)
MCV	77 fl (80-96)
MCH	26.2 pg (28-32)
Serum B12	140 ug/L (160-760)

Red cell folate 95 ug/L (160-640)

Serum ferritin 10 ug/L (15-300)

What disease specific antibody is most likely to be present?

- 1- Anti-endomysial
- 2- Anti-gastric parietal cell
- 3- Anti-glutamic acid decarboxylase
- 4- Anti-intrinsic factor
- 5- Antimitochondrial

Answer & Comments

Answer: 1- Anti-endomysial

The patient has hyposplenism as suggested by the blood film and a mixed anaemia. Coeliac disease could therefore fit the above picture with anti-endomysial antibodies being the most appropriate selection from the above list. Antimitochondrial antibodies are seen in PBC, anti-gastric and anti intrinsic Abs are seen in pernicious anaemia. Anti-GAD abs are found in auto-immune DM.

Screening for coeliac disease should include high-risk groups such as anaemia (iron or folate deficiency), hyposplenism, reduced bone density and infertility.

"Anti-endomysial IgA antibodies are extremely specific markers for CD and for dermatitis herpetiformis. These antibodies are directed to a component of the gut endomysium (connective tissue surrounding smooth muscle fibers of the gut).



[Q: 804] OnExamination - Gastroenterology

A 22-year-old man presented to casualty one week after returning from a six month visit to Pakistan. He complained of fever, rigors and headache. On examination he was febrile (38 C) with a blood pressure of 115/65 mmHg, and a pulse of 100/minute.

His abdomen was tender in the right upper quadrant.

Investigations showed:

Hb 11.0 g/dL

WBC $15.5 \times 10^9/L$

Neutrophils $13.5 \times 10^9/L$

Platelets $350 \times 10^9/L$

Blood film No malaria parasites seen

Alk Phos 450 iU/L

AST 50 iU/L

CRP 88 mg/L

Stool culture Negative

Chest x-ray: Small right pleural effusion noted

Which of the following investigations would be of most diagnostic value?

- 1- Hepatitis E serology
- 2- Sigmoidoscopy
- 3- Stool microscopy for ova, cysts and parasites
- 4- Typhoid serology
- 5- Ultrasound scan of the abdomen

Answer & Comments

Answer: 5- Ultrasound scan of the abdomen

The presentation is not consistent with Hepatitis E infection. Typhoid serology is unreliable. The differential diagnosis is mainly pyogenic or amoebic liver abscess. Pyogenic abscesses present with swinging pyrexia, neutrophilia and high inflammatory markers. Right-sided pleural effusions are common and blood cultures are often positive. The presentation of amoebic liver abscess (ALA) is very similar. Most patients do not have bowel symptoms at any time and amoebic cysts are found in stool in less than 50% of proven cases of ALA. Serology is the main stay of diagnosis. Ultrasound scan would confirm most moderate-sized to large liver abscesses; and

could guide a diagnostic aspiration, Small lesions are best demonstrated by CT or MRI.



[Q: 805] OnExamination - Gastroenterology

A group of construction workers presented to the accident and emergency department with diarrhoea, flushing, sweating and a hot mouth. They fell ill minutes after eating lunch in the staff canteen. They admitted that they had eaten tuna fish and wine.

What is the likely cause of food poisoning?

- 1- Clostridium perfringens
- 2- Heavy metal
- 3- Mushroom
- 4- Scrombotoxin
- 5- Staphylococcus aureus

Answer & Comments

Answer: 4- Scrombotoxin

Scrombotoxin food poisoning is caused by the ingestion of foods that contain high levels of histamine and possibly other vasoactive amines and compounds. Histamine and other amines are formed by the growth of certain bacteria and the subsequent action of their decarboxylase enzymes on histidine and other amino acids in food, either during the production of a product such as Swiss cheese or by spoilage of foods such as fishery products, particularly tuna or mahi mahi. Incubation period is 10-60 minutes.



[Q: 806] OnExamination - Gastroenterology

A previously well 40-year-old man is admitted with a single haematemesis after taking 300 mg of aspirin five hours previously.

On examination, pulse was 120/min with a blood pressure of 110/75 mmHg (lying) and 90/60 mmHg (standing). Respiratory and

abdominal examination was otherwise normal.

His haemoglobin concentration returned as 7 g/dL (13.0 - 16.5).

What is the most likely cause of his haemetemesis?

- 1- Angiodysplasia
- 2- Duodenal ulcer
- 3- Gastric cancer
- 4- Gastric erosions
- 5- Oesophagitis

Answer & Comments

Answer: 4- Gastric erosions

The most likely answer is gastric erosions based upon the fact that the incident has occurred after only one dose of Aspirin without any prior history of chronic usage which is associated with oesophagitis and ulcer formation. Malignancy is unlikely because of history of being fit and also the age.



[Q: 807] OnExamination - Gastroenterology

A 52-year-old man with a diagnosis as a child of coeliac disease had been asymptomatic despite poor dietary compliance. He presents with a one month history of intermittent, colicky, central abdominal pain and 3 kilogram weight loss and positive faecal occult bloods.

What is the most appropriate investigation?

- 1- Anti-endomysial antibody.
- 2- Colonoscopy.
- 3- CT scan of abdomen.
- 4- Distal duodenal biopsy.
- 5- Small bowel enema.

Answer & Comments

Answer: 2- Colonoscopy.

New-onset weight loss, with positive faecal occult bloods and central abdo pain in a 52-year-old man must be assumed to be colonic carcinoma until proven otherwise. Colonoscopy is the best way to check for this and would also demonstrate inflammatory bowel disease if present. If the colonoscopy were negative, then an OGD would be needed to check for upper GI malignancy.



[Q: 808] OnExamination - Gastroenterology

A 70 year-old man is admitted with pruritus, jaundice and a 2kg weight loss of two weeks duration. He had not drunk any alcohol for at least eight years. One month ago, he had completed a course of Co-Amoxiclav which had been prescribed by his GP for sinusitis and was also taking Ibuprofen for hip osteoarthritis. Investigations reveal:

Albumin 38 g/L (37-49)

Bilirubin 200 umol/L (1-22)

AST 200 iu/L (5-35)

Alkaline Phosphatase 200 iu/l (50-110)

Abdominal ultrasound reveals gallstones but no biliary duct dilatation

What is the most likely cause of his jaundice?

- 1- Cholangio-carcinoma
- 2- Co-Amoxiclav
- 3- Hepatitis B infection
- 4- Hepatitis C infection
- 5- Ibuprofen

Answer & Comments

Answer: 2- Co-Amoxiclav

Co amoxiclav (Augmentin) is notorious for causing drug-induced jaundice, often with a mixed hepatic/cholestatic picture. A 4 week delay in symptoms and signs is not unusual. Flucloxacillin is another common culprit. The

patient must be warned that this could re-occur if he is given Co amoxiclav again.



[Q: 809] OnExamination - Gastroenterology

Which statement is true concerning iron?

- 1- Iron absorption is mainly in the distal jejunum.
- 2- Parenteral iron is indicated if the haemoglobin level is not raised within 3 days by oral iron.
- 3- Sustained release preparations are useful if larger doses are required.
- 4- 200mg iron sulphate has more elemental iron than an equal dose of iron gluconate.
- 5- Absorption is prevented by ascorbic acid.

Answer & Comments

Answer: 4- 200mg iron sulphate has more elemental iron than an equal dose of iron gluconate.

Important for the structure of haemoglobin and myoglobin for O₂ and CO₂ transport; oxidative enzymes; cytochrome C and catalase. Absorbed in ferrous form in small bowel according to body need, aided by gastric juice and ascorbic acid; hindered by fibre, phytic acid and steatorrhoea. Transported in plasma in ferric state bound to transferrin; stored in liver, spleen, bone marrow and kidney as ferritin and haemosiderin; conserved and reused; minimal losses in urine and sweat; about 90% of intake excreted in stool. Ferrous sulphate contains about twice the amount of elemental iron as the gluconate. Levels raise Hb levels about 0.5g/100ml per week. Sustained release preparations should not be used, as they delay release beyond the early small bowel, where most iron absorption occurs.



[Q: 810] OnExamination - Gastroenterology

A 32 year-old woman with Crohn's Disease has a history of a right hemicolectomy for ileo-colonic disease. Since the operation she has had frequent diarrhoea but no blood in the stools.

Investigations show:

ESR 10

PLT 240

serum CRP 7 (< 10)

Which is the best treatment?

- 1- Cholestyramine
- 2- Mesalazine
- 3- Metronidazole
- 4- Omeprazole
- 5- Prednisolone

Answer & Comments

Answer: 1- Cholestyramine

The ESR, CRP and platelet counts are not raised, indicating that this patient's symptoms are not due to active Crohn's.

Also the diarrhoea is not bloody which goes against active Crohn's colitis. Hence mesalazine or prednisolone would not be effective here. Metronidazole is typically given for peri-anal disease. The history includes a previous right hemicolectomy for ileo-colonic disease. Loss of the terminal ileum frequently leads to bile salt malabsorption and treatment with the bile salt chelator cholestyramine quickly relieves the problem.



[Q: 811] OnExamination - Gastroenterology

Reflux oesophagitis of gastric contents

- 1- is a cause of asthma
- 2- can be improved by Helicobacter pylori eradication

- 3- Occurs during transient relaxation of the lower oesophageal sphincter
- 4- Is neutralised by bicarbonate secreted by the oesophageal mucosa
- 5- Can be excluded by a normal appearance at endoscopy

Answer & Comments

Answer: 3- Occurs during transient relaxation of the lower oesophageal sphincter

Diagnosis is based predominantly on history, with a very proportion of patients with reflux disease having a normal endoscopy. H pylori eradication is indicated in long term healing of gastric and duodenal ulceration, but not reflux disease. Brunner's glands are found in the duodenum which secrete alkaline mucus. Intra-oesophageal PH monitoring is used to exclude reflux as cause of bronchoconstriction. Reflux oesophagitis of gastric contents is a cause of chronic cough and not asthma.



[Q: 812] OnExamination - Gastroenterology

A 24-year-old woman has ingested an unknown quantity of Paracetamol tablets 4 hours ago. She now presents with nausea, vomiting, anorexia and right subchondral pain.

Which of the following features suggest that she should be transferred to the liver unit?

- 1- ALT 800 units/L
- 2- Blood glucose 5 mmol/L
- 3- Heart rate 120 BPM
- 4- pH 7.25
- 5- Systolic BP 100 mmHg

Answer & Comments

Answer: 4- pH 7.25

A pH of less than 7.3 is a poor prognostic factor for this patient.

The criteria for transfer to a specialist unit are:

Encephalopathy

INR >2.0 at <48h or >3.5 at <72h

Serum creatinine >200 µmol/L

Blood pH <7.3

Systolic BP <80 mmHg



[Q: 813] OnExamination - Gastroenterology

A 40 year-old man is referred with gastro-oesophageal reflux disease (GORD).

Which of the following concerning GORD is correct?

- 1- Acid suppressant therapy should not be given continuously
- 2- Endoscopy is mandatory
- 3- In the presence of Barrett's oesophagus, the risk of future malignancy can be assessed endoscopically without biopsy
- 4- Oesophageal pH monitoring is a good guide to therapy
- 5- Symptoms do not correlate with mucosal status at endoscopy

Answer & Comments

Answer: 5- Symptoms do not correlate with mucosal status at endoscopy

Symptoms of GORD do not correlate with the mucosal appearances at endoscopy. Although endoscopy should be performed in cases that are not clear cut or do not respond to PPI, it is not mandatory. The risk with Barrett's and hence the diagnosis of Barrett's can only be clarified with biopsy.

Monitoring of pH is not a good guide to therapy but symptomatic improvement is a good guide to the efficacy of therapy. PPIs can be given continuously where the diagnosis has been satisfactorily proven and relapse of symptoms persist after withdrawal.



[Q: 814] OnExamination -
Gastroenterology

Which ONE of the following statements is true of autoimmune hepatitis:

- 1- It usually presents as an acute hepatitis
- 2- It rarely presents before 20 years of age
- 3- It may be associated with keratoconjunctivitis sicca
- 4- It is associated with hypogammaglobulinaemia
- 5- It rarely interferes with menstruation except in later stages

Answer & Comments

Answer: 3- It may be associated with keratoconjunctivitis sicca

It occurs frequently in young (10-20 years) and middle-aged women. 25% present as acute hepatitis, but usually the onset is insidious. Some may be asymptomatic for years and then are found to have signs of chronic liver disease. Amenorrhoea is common. It is associated with hyperglobulinaemia and other autoimmune disease. 60% are associated with HLA-B8, DR3 and Dw3. The sicca syndrome (xerostomia/dry eyes, keratoconjunctivitis sicca) may occur.



[Q: 815] OnExamination -
Gastroenterology

Which of the following is most commonly associated with the development of pseudo-membranous colitis?

- 1- Cefuroxime
- 2- Ciprofloxacin
- 3- Co-trimoxazole
- 4- Erythromycin
- 5- Flucloxacillin

Answer & Comments

Answer: 1- Cefuroxime

Clostridium difficile a gram positive anaerobic bacterium is the cause of pseudo-membranous colitis. Studies show that when *C. difficile* colonize the gut, they release two potent toxins, toxin A and toxin B, which bind to certain receptors in the lining of the colon and ultimately cause diarrhea and inflammation of the large intestine, or colon (colitis). Commonly the disease is caused by broad spectrum antibiotics most commonly - cephalosporins, broad spectrum penicillins and clindamycin. Less commonly, macrolides and quinolones have been reported to cause the disorder. Appropriate treatment includes metronidazole and oral vancomycin.



[Q: 816] OnExamination -
Gastroenterology

Which one of the following organs is in direct contact with the anterior surface of the left kidney, without being separated from it by peritoneum?

- 1- Duodenum
- 2- Jejunum
- 3- Pancreas
- 4- Spleen
- 5- Stomach

Answer & Comments

Answer: 3- Pancreas

This is a basic anatomy question. However the only retroperitoneal structure is the pancreas, the body of which is in direct approximation to the anterior surface of the left kidney



[Q: 817] OnExamination -
Gastroenterology

A 42-year-old female with Ulcerative Colitis is found to have anti-smooth muscle antibodies.

Which is the next most appropriate test for this patient?

- 1- Abdominal Ultrasound
- 2- Colonoscopy
- 3- Full blood count
- 4- Liver biopsy
- 5- Liver function tests

Answer & Comments

Answer: 5- Liver function tests

The most appropriate investigation for this woman is LFTs to begin with to assess if there are any features of autoimmune hepatitis i.e. raised bilirubin, AST, ALT and Alkaline Phosphatase. If this is the case then liver biopsy may be required or further diagnostic imaging.



[Q: 818] OnExamination - Gastroenterology

A 67-year-old man with known aortic valvular disease is admitted with deteriorating dyspnoea. Investigations show:

haemoglobin 9 g/dL (12-16) MCV 70 fL (80-96)

upper gastrointestinal tract endoscopy: normal

duodenal biopsy: normal

Which one of the following investigations is most likely to provide the diagnosis?

- 1- Barium enema
- 2- colonoscopy
- 3- CT abdomen
- 4- mesenteric angiography
- 5- small bowel enema

Answer & Comments

Answer: 2- colonoscopy

In the older age group investigation of the lower GI tract is vital to exclude a lower GI malignancy. CT scans do not demonstrate colonic pathology as well as colonoscopy which is still considered the gold standard. Angiography is only helpful if the patient is bleeding briskly at the time of the examination.



[Q: 819] OnExamination - Gastroenterology

A 24-year-old woman had ulcerative colitis for seven years and was prescribed mesalazine 1.5 g per day. She smoked 20 cigarettes per day and was 10 weeks pregnant. She complained of worsening symptoms with six bloody stools per day.

Which one of the following statements is correct?

- 1- Azathioprine is contraindicated.
- 2- Initiation of an elemental diet risks fetal malnutrition.
- 3- Oral corticosteroids are contraindicated.
- 4- Oral mesalazine therapy should be withdrawn.
- 5- Termination of the pregnancy is advisable.

Answer & Comments

Answer: 1- Azathioprine is contraindicated.

The effect of pregnancy on UC is variable. Oral corticosteroids and mesalazine are not contraindicated. In general, the health of a mother with UC is the best predictor of the outcome of the pregnancy. Hence drug treatment is preferred to leaving active disease untreated. The BNF states that azathioprine should not generally be started during pregnancy, but it is only relatively contraindicated. However, azathioprine is concentrated in breastfeeding. In the context of pregnancy, an elemental diet does not risk maternal and/or fetal malnutrition.



[Q: 820] OnExamination -
Gastroenterology

A 28-year-old lady develops abdominal pain, jaundice and ascites worsening over a week. She drinks ten units of alcohol each week and takes the oral contraceptive pill.

Which of the following findings would make a diagnosis of hepatic vein thrombosis (Budd-Chiari syndrome) MOST likely?

- 1- alanine aminotransferase of 345 U/L (5 - 35)
- 2- acute liver failure
- 3- ankle oedema
- 4- ascites fluid protein of 38 g/L
- 5- tender enlarged liver

Answer & Comments

Answer: 5- tender enlarged liver

The most common causes of an acute severe liver injury in a young woman are: viruses (including: HAV, HBV), drugs (particularly paracetamol OD), Autoimmune hepatitis, and hepatic vein thrombosis (often precipitated by pregnancy or OCP use). The presence of liver failure, ankle oedema, and an exudative ascites do not help differentiate between these aetiologies. The ALT of 345 is moderately elevated and compatible with BCS. With viral or drug related hepatitis the peak ALT is usually much higher than this, the ALT may already be on the way down if she has had symptoms for a week. Tender hepatomegaly is one of the hallmarks of BCS. In acute severe viral, autoimmune or drug / toxin related liver disease the necrotic liver decreases in size.



[Q: 821] OnExamination -
Gastroenterology

A 30 year-old male presents with acute, profuse, watery diarrhoea with some blood after returning from a holiday in Tanzania. He had been taking oral rehydration salts.

Which one of the following is the most appropriate treatment?

- 1- Ciprofloxacin
- 2- Loperamide
- 3- Metronidazole
- 4- Prednisolone
- 5- Vancomycin

Answer & Comments

Answer: 1- Ciprofloxacin

The most likely cause of such travellers diarrhoea is *Escherichia coli* and hence ciprofloxacin is recommended for first line antibiotic therapy (when needed) before stool culture results are available. Metronidazole would be suitable for *Giardia* infection but its course is usually more insidious.



[Q: 822] OnExamination -
Gastroenterology

A 17-year-old student returns from a back-packing trip to Nepal with a two-week history of offensive diarrhoea and weight loss.

What is the most likely infective organism?

- 1- *Escherichia coli* 0157
- 2- *Giardia intestinalis* (G.lamblia)
- 3- *Shigella flexneri*
- 4- *Salmonella typhi*
- 5- *Yersinia enterocolitica*

Answer & Comments

Answer: 2- *Giardia intestinalis* (G.lamblia)

The best bet here is Giardiasis as it presents as chronic diarrhoeal illness due to duodenal infestation by the faeco-oral route. Malabsorption can occur along with epigastric discomfort and flatulence. *Escherichia coli* does not have a chronic illness (neither does *Shigella*) and like *Yersinia* causes bloody diarrhoea. *Salmonella typhi* is likely to cause a

particularly serious systemic illness in this patient.



[Q: 823] OnExamination -
Gastroenterology

Which of the following concerning the conjugation of bilirubin is correct?

- 1- is catalysed by a glucuronyl transferase
- 2- occurs in the Kupfer cells of the liver
- 3- is increased by valproate
- 4- is inhibited by rifampicin
- 5- is impaired in Dubin-Johnson syndrome

Answer & Comments

Answer: 1- is catalysed by a glucuronyl transferase

b - Hepatocytes.

c - Enzyme inhibitor.

d - Enzyme inducer.

e - Conjugation is OK but excretion from the hepatocyte into the bile is impaired. (Gilbert's syndrome - bilirubin can't go in to the hepatocyte - unconjugated bilirubinaemia. Crigler-Najjar syndrome - bilirubin can't conjugate - unconjugated bilirubinaemia. Dubin-Johnson syndrome - bilirubin can't depart from the hepatocyte - conjugated bilirubinaemia.)



[Q: 824] OnExamination -
Gastroenterology

A 51-year-old man was brought to Accident and Emergency for loose stools. He was dehydrated, weak and in shock. He had previously been complaining of large stool volumes for a 1 month period. Stool colour was normal. There was no history of laxative abuse and no significant past medical history.

What is the most likely diagnosis?

- 1- Carcinoid syndrome

- 2- Diabetic diarrhoea
- 3- Gastrinoma
- 4- Systemic mastocytosis
- 5- VIPoma

Answer & Comments

Answer: 5- VIPoma

VIPomas are endocrine tumours that secrete excessive amounts of VIP32, which causes a distinct syndrome characterized by large-volume watery diarrhoea, hypokalaemia, and dehydration. This syndrome is also called Verner-Morrison syndrome, pancreatic cholera, or WDHA syndrome for watery diarrhoea, hypokalaemia, and achlorhydria, which some patients develop. The mean age of patients is 49 years; however, it can occur in children, and when it does is usually caused by a ganglioneuroma or ganglioneuroblastoma. A stool volume of <700 mL/d excludes the diagnosis of VIPoma.



[Q: 825] OnExamination -
Gastroenterology

A 68-year-old male presents with alcoholic cirrhosis complicated by mild ascites.

Which of the following features is likely in this patient?

- 1- Increased serum sodium
- 2- Increased vascular resistance
- 3- Reduced urinary potassium excretion
- 4- Reduced renin concentrations
- 5- Reduced urinary sodium excretion

Answer & Comments

Answer: 5- Reduced urinary sodium excretion

Remember they have secondary hyperaldosteronism - sodium retention with consequent potassium loss. There is decreased vascular resistance, increased plasma volume and low serum sodium.



[Q: 826] OnExamination -
Gastroenterology

A 26-year-old presents in the first trimester of her first pregnancy (six weeks gestation) for an ante-natal check, she feels well. Blood tests show a Bilirubin of 40 $\mu\text{mol/l}$ the other LFT's are completely normal.

The most likely diagnosis is:

- 1- Gilbert's syndrome
- 2- Primary biliary cirrhosis
- 3- Primary sclerosing cholangitis
- 4- Dubin-Johnson syndrome
- 5- Cholestasis of pregnancy

Answer & Comments

Answer: 1- Gilbert's syndrome

Gilbert's is the most common condition causing mild isolated hyperbilirubinaemia. PBC & PSC are much less common conditions and are almost always associated with a rise in the other LFT's (particularly ALP & GGT). DJS is much less common than Gilbert's. Intrahepatic cholestasis of pregnancy is relatively common but usually occurs in the second or third trimester, ALP is usually high, risk increases with multiparity.



[Q: 827] OnExamination -
Gastroenterology

A 52-year-old woman presented with history of worsening dysphagia over many years. Recently there had been episodes of ill-defined central chest discomfort and nocturnal cough.

What is the most likely diagnosis?

- 1- achalasia
- 2- Barrett's oesophagus
- 3- motor neurone disease
- 4- oesophageal carcinoma
- 5- pharyngeal pouch

Answer & Comments

Answer: 1- achalasia

Achalasia presents most often in the 3rd - 5th decade. Symptoms usually develop years before the patient presents. Vague chest discomfort is common. 30% have a nocturnal cough due to aspiration of oesophageal contents.

Barrett's oesophagus does not cause dysphagia.

MND causes dysphagia due to problems with chewing and initiating a swallow and would not cause chest discomfort.

Oesophageal carcinoma is very unlikely due to the duration of symptoms (years).

A pharyngeal pouch usually presents in the 6th-7th decade with regurgitation and would not cause chest discomfort



[Q: 828] OnExamination -
Gastroenterology

A 50-year-old woman with a long history of alcohol abuse is prescribed Phenytoin for epilepsy. Examination was normal except for a liver edge. Her full blood count reveals

haemoglobin 10.0 g/dL (13-18)

MCV 122 fL (80-96)

white cell count $2.2 \times 10^9/\text{L}$ (4-11)

platelet count $85 \times 10^9/\text{L}$ (150-400)

What is the most likely explanation for these results?

- 1- Alcoholic liver disease
- 2- Aplastic anaemia
- 3- Folic acid deficiency
- 4- Hypothyroidism
- 5- Vitamin C deficiency

Answer & Comments

Answer: 3- Folic acid deficiency

Folic acid deficiency would give all these results. In addition she has good reason to be folate deficient- drinks a considerable amount and is on anticonvulsants.

Alcoholic liver disease, on its own would not make you leucopenic.

Hypothyroidism, would cause a raised MCV, but not the other parameters.

Scurvy does not cause this picture.

Aplastic anaemia could cause this haematological picture, but the clinical scenario leads you towards folic acid deficiency.



[Q: 829] OnExamination - Gastroenterology

A 42-year-old female presents with tiredness. Her investigations reveal:

Haemoglobin 7.8 g/dl (11.5 - 16.5)

MCV 72 fL (80 - 96)

white cell count $7.6 \times 10^9/L$ (4 - 11)

platelet count $350 \times 10^9/L$ (150 - 400)

serum ferritin 8 µg/L (15 - 300)

She was commenced on oral iron therapy and one month later her haemoglobin concentration was 8.0 g/dl.

What is the most likely cause of the failure of her haemoglobin to respond to this treatment?

- 1- coeliac disease
- 2- folate deficiency
- 3- inadequate dosage of iron
- 4- poor compliance with therapy
- 5- sideroblastic anaemia

Answer & Comments

Answer: 4- poor compliance with therapy

The most likely explanation for the failure of an iron deficiency anaemia to respond to iron

therapy in a menstruant female is poor compliance. It is likely that the dose that this patient is prescribed would be adequate and if not some response would still be expected. There is no evidence of a concomitant folate deficiency as suggested by the blood picture, which would also argue against Coeliac disease. Similarly, there is no evidence to suggest a sideroblastic anaemia where a raised MCV and increased ferritin may be expected.



[Q: 830] OnExamination - Gastroenterology

Which of the following is activated by Cholera toxin?

- 1- Adenylate cyclase
- 2- Guanylate cyclase
- 3- Peroxisome proliferator receptor (PPAR) gamma
- 4- Sodium/potassium ATPase
- 5- The glucose-sodium transporter

Answer & Comments

Answer: 1- Adenylate cyclase

Cholera toxin activates adenylate cyclase with generation of cAMP.



[Q: 831] OnExamination - Gastroenterology

A 55 year-old woman presents with lethargy, diarrhoea together with joint pains and intermittent fever. These symptoms have developed over the six months during which time she has lost 6 kg in weight.

Supraclavicular lymphadenopathy is noted.

What is the most likely diagnosis?

- 1- bacillary dysentery
- 2- campylobacter infection
- 3- Coeliac disease
- 4- giardiasis

5- Whipple's disease

Answer & Comments

Answer: 5- Whipple's disease

Whipple's disease is caused by Tropheryma Whippeli and symptoms include chronic diarrhoea, arthralgia, pyrexia and lymphadenopathy. Diagnosis is by microscopy of Jejunal biopsy specimen which shows macrophages with PAS positive granules.

Treatment is Cotimoxazole.

Bacillary dysentery and c.jejuni infection is characterised by bloody diarrhoea and is not chronic.

Coeliac disease and Giardiasis has no lymph involvement.



[Q: 832] OnExamination - Gastroenterology

A 24-year-old man with chronic diarrhoea and malabsorption is suspected of having coeliac disease. A jejunal biopsy is taken.

Which of the following findings would be expected in coeliac disease?

- 1- Shows leaf-shaped villi
- 2- Shows flattening of the crypts
- 3- Appearances may resemble severe tropical sprue
- 4- Shows fissures penetrating into the submucosa
- 5- Characteristically shows epithelial cells distended with fat globules

Answer & Comments

Answer: 3- Appearances may resemble severe tropical sprue

In coeliac disease, the villi are shortened and the crypts lengthened with increased lymphocytic infiltrate. Tropical sprue may also

cause subtotal villous atrophy. Fissures are not found and epithelial cells are normal.



[Q: 833] OnExamination - Gastroenterology

A 65 year-old male presents with a four month history of diarrhoea with pale stools and weight loss.

Relevant results show:

Calcium 1.8 mmol/L (2.2-2.6)

Alkaline phosphatase 350 U/L (45-105)

What is the most likely diagnosis?

- 1- coeliac disease
- 2- Giardia lamblia infection
- 3- pancreatic carcinoma
- 4- Small Intestinal bacterial overgrowth
- 5- Whipple's disease

Answer & Comments

Answer: 3- pancreatic carcinoma

The patient has a marked osteomalacia associated with malabsorption. In this age pancreatic carcinoma is the most probable diagnosis. Coeliac disease very seldom causes such an increased alk phos and is more likely to present with iron deficiency anaemia. The villous atrophy caused by Giardia is very transient. Whipples is extremely rare, found in middle aged men and caused by a bacillus, Tropheryma Whippelii.



[Q: 834] OnExamination - Gastroenterology

A 50-year-old male with a history of alcohol excess, presents with a 2 week history of confusion.

Which of the following strongly suggests a diagnosis of Korsakoff's psychosis?

- 1- delusional jealous beliefs
- 2- epileptic seizures

- 3- impaired long term memory
- 4- inventing recent events
- 5- visual hallucinations

Answer & Comments

Answer: 4- inventing recent events

Korsakoff's is associated with short term memory loss, with subsequent compensatory confabulation by the patient. Other symptoms may include delirium, anxiety, fear, depression, confusion, delusions and insomnia; painful extremities, sometimes bilateral wrist drop, but more frequently bilateral foot drop with pain or pressure over the long nerves. The treatment is intravenous thiamine, and attention to the consequences of alcohol withdrawal.



[Q: 835] OnExamination - Gastroenterology

A 20-year-old woman was referred for investigation of iron deficiency anaemia. Her mother died aged 28 years from colonic carcinoma complicating Peutz-Jeghers syndrome.

Which is the most likely mode of inheritance of Peutz-Jeghers syndrome?

- 1- Autosomal dominant
- 2- Autosomal recessive
- 3- Mitochondrial
- 4- Polygenic
- 5- X-linked dominant

Answer & Comments

Answer: 1- Autosomal dominant

Peutz Jegher syndrome is a condition characterised by perioral pigmentation and numerous hamartomas of the bowel. Originally it was assumed that these did not predispose to malignancy but studies now

suggest the contrary. The condition is autosomal dominant.



[Q: 836] OnExamination - Gastroenterology

Which one of the following require urgent referral for upper endoscopy?

- 1- A 45-year-old male with a one month history of persistent dyspepsia.
- 2- A 56-year-old male with a one month history of dyspepsia and a pulsatile central abdominal mass
- 3- A 73-year-old male with a three month history of dyspepsia which has failed to respond to a course of proton pump inhibitors
- 4- A 35-year-old male who has a history of waterbrash and dyspepsia which has responded to a course of ranitidine but since stopping has recurred.
- 5- A 62-year-old male with a three month history of unexplained weight loss, tenesmus and a right abdominal mass.

Answer & Comments

Answer: 3- A 73-year-old male with a three month history of dyspepsia which has failed to respond to a course of proton pump inhibitors

Criteria for referral for urgent endoscopy include dysphagia (at any age); dyspepsia at any age combined with any one of weight loss, anaemia or vomiting; dyspepsia in a patient aged 55 or above with onset of dyspepsia within one year and persistent symptoms; Dyspepsia with one of Barrett's oesophagus, FH of upper GI carcinoma, pernicious anaemia or Upper GI surgery more than 20 years ago; Jaundice; abdominal mass. With regard to the presented cases, the second case has dyspepsia with what seems to be an aortic aneurysm. This requires a ultrasound and vascular opinion. In the last case of unexplained weight loss, tenesmus and upper

right mass the problem is likely to be a colonic carcinoma.



[Q: 837] OnExamination -
Gastroenterology

A 28-year-old male presents with a four day history of profuse bloody diarrhoea after returning from a holiday in the Far East.

Which of the following regarding his illness is true?

- 1- a negative amoebic fluorescent antibody test excludes a diagnosis of acute amoebic dysentery
- 2- Cysts to Entamoeba histolytica in the stools confirms a diagnosis of acute amoebic dysentery
- 3- cholera is a likely diagnosis
- 4- Giardiasis is a likely diagnosis
- 5- shigellosis is a likely diagnosis

Answer & Comments

Answer: 5- shigellosis is a likely diagnosis

Shigellosis is a possible cause of profuse bloody diarrhoea as cholera and giardiasis are associated with watery diarrhoea. Trophozoites seen in acute amoebic dysentery, and the test is not 100% sensitive.



[Q: 838] OnExamination -
Gastroenterology

Which of the following is NOT true of a patient with ascites due to liver cirrhosis:

- 1- Spontaneous bacterial peritonitis is a recognised feature
- 2- The usual source of the ascitic fluid is mainly from the exudation from the surface of the liver
- 3- Hepatic intrasinusoidal pressure is elevated
- 4- Urinary sodium concentration is usually less than 10 mmol/l
- 5- Cardiac output is often elevated

Answer & Comments

Answer: 2- The usual source of the ascitic fluid is mainly from the exudation from the surface of the liver

Hepatocellular failure is associated with hyperdynamic circulation and systemic vasodilatation, with increased vascular capacitance. Most patients have sodium and water retention.



[Q: 839] OnExamination -
Gastroenterology

A 55-year-old female is referred by her GP with abnormal liver function tests. She is overweight but otherwise well. Liver biopsy is reported as showing evidence of non-alcoholic steatotic hepatitis(NASH).

Which of the following statements is correct concerning NASH?

- 1- Commoner in males than females
- 2- Is treated with urso-deoxycholic acid
- 3- Is associated with insulin resistance
- 4- Is treated with Rosiglitazone
- 5- The majority of patients will develop cirrhosis

Answer & Comments

Answer: 3- Is associated with insulin resistance

NASH is associated with increased prevalence of Insulin resistance/type 2 diabetes. Approximately 20% develop cirrhosis

It is more common in obese females and the treatment is weight reduction.



[Q: 840] OnExamination -
Gastroenterology

A study comparing contrast CT colonography with the reference technique of colonoscopy for large bowel carcinoma reveals the following data in 400 patients:

	CT Positive	CT Negative
Colonoscopy Positive	30	10
Colonoscopy negative	20	340

Which one of the following most accurately describes the performance of CT versus colonoscopy for the diagnosis of large bowel cancer?

- 1- There are 340 false negatives
- 2- There are 370 false negatives
- 3- There are 10 false positives
- 4- There are 20 false positives
- 5- There are 20 true negatives

Answer & Comments

Answer: 4- There are 20 false positives

There are 40 true positive patients identified by Colonoscopy with colon cancer and 10 of these are false negatives as identified by CT. There are 360 patients without the disease with 20 identified as having cancer with CT (false positives).



[Q: 841] OnExamination - Gastroenterology

A 54-year-old woman presented with an eighteen month history of chest pain and dysphagia for both solids and liquids. She smokes 20 cigarettes per day and drinks 16 units of alcohol per week. Clinical examination was normal.

What is the most likely diagnosis?

- 1- Achalasia.
- 2- Bronchial neoplasm.
- 3- Oesophageal neoplasm.
- 4- Oesophageal web.
- 5- Pharyngeal pouch.

Answer & Comments

Answer: 1- Achalasia.

A longstanding history of dysphagia to both solids and liquids suggests a functional rather than mechanical cause for the dysphagia. Hence a neoplasm or other obstructive lesion is unlikely. Chest pain is not a typical feature of a pharyngeal pouch. Achalasia, in which there is failure of oesophageal peristalsis and of relaxation of the lower oesophageal sphincter, typically causes the symptoms described above.



[Q: 842] OnExamination - Gastroenterology

A 36-year-old man presented with a three day history of bloody diarrhoea. He was afebrile and mildly icteric. Investigations revealed:

Haemoglobin 10.5 g/dL (13.0-18.0)

White cell count $19 \times 10^9/L$ (4-11)

Platelets $70 \times 10^9/L$ (150-400)

Serum urea 12.5 mmol/L (2.5-7.5)

Serum aspartate aminotransferase 90 IU/L (1-31)

Prothrombin time 12s (11.5-15.5)

Blood film fragmented red cells

What is the most likely cause of his illness?

- 1- Escherichia coli 0157 colitis
- 2- Ischaemic colitis
- 3- Leptospirosis
- 4- Salmonella enterocolitis
- 5- Ulcerative colitis

Answer & Comments

Answer: 1- Escherichia coli 0157 colitis

The combination of bloody diarrhoea, haemolytic anaemia, thrombocytopenia but normal clotting, and renal impairment suggests haemolytic-uraemic syndrome. This

is associated with E coli 0157 toxin most commonly.



[Q: 843] OnExamination -
Gastroenterology

Ten individuals are admitted to casualty with profuse vomiting after attending a retirement dinner in a Chinese restaurant. They all ate at roughly 7 pm and became ill at roughly midnight. Nine ate a mixture of dishes except one female who ate vegetarian dishes with her rice.

What is the most likely infective organism?

- 1- Salmonella enteritidis
- 2- Staphylococcus aureus
- 3- Escherichia coli
- 4- Clostridium perfringens
- 5- Bacillus cereus

Answer & Comments

Answer: 5- Bacillus cereus

This is a typical case of Bacillus cereus, with profuse vomiting which occurs approx 1-5 hrs after eating. In this case it is likely that the rice itself had been infected. Another possibility is Staph. aureus although this is less likely.



[Q: 844] OnExamination -
Gastroenterology

A 24-year-old woman who has a long history of ulcerative colitis and takes Mesalazine 3g per day discovers that she is 10 weeks pregnant. She is also a smoker of 15 cigarettes daily. She now presents with a deterioration of symptoms with six bloody stools per day.

Which one of the following statements is correct?

- 1- Azathioprine would be contraindicated
- 2- Initiating an elemental diet predisposes to foetal malnutrition
- 3- Mesalazine therapy should be withdrawn

4- Steroid therapy is contraindicated

5- Termination of the pregnancy is advised

Answer & Comments

Answer: 1- Azathioprine would be contraindicated

Azathioprine should not generally be started in pregnancy. Well controlled ulcerative colitis is more important for the baby from a nutritional point of view. An elemental diet simply contains pre-digested food and would not lead to fetal malnutrition. The safety of the 5-ASA drugs in pregnancy is best supported by the data on salazopyrine which has been available for the longest.



[Q: 845] OnExamination -
Gastroenterology

A 55 year-old man on no current treatment for his quiescent ulcerative colitis is found to have an ESR of 95 mm/hr.

Investigations show:

Haemoglobin	13.2 g/L
WCC	4.5
PLT	160
Corrected Calcium	2.58
IgG	25 (6-13)
IgA	1.8 (0.9-3)
IgM	1.6 (0.4-2.2).

What is the most appropriate next investigation?

- 1- Bone marrow trephine and aspiration.
- 2- Isotope bone scan.
- 3- Plasma immunoelectrophoresis.
- 4- Rectal biopsy.
- 5- X-Ray Skeletal survey.

Answer & Comments

Answer: 3- Plasma immunoelectrophoresis.

The ESR is not raised in quiescent UC. Hence, there must be another reason in this case. The only abnormal result given is a raised IgG. This suggests that myeloma is the diagnosis. Plasma immunoelectrophoresis, to look for an M band, is the most appropriate next investigation. A bone marrow trephine is the definitive investigation but is traumatic and painful to the patient and so is not the next investigation of choice.



[Q: 846] OnExamination - Gastroenterology

A 35-year-old obese Afrocarribean lady presents with mild jaundice. She claims to be a teetotaler ممتنع عن المسكرات and her BMI is 30 kg/m².

Investigations reveal the following results.

Haemoglobin 14g/dL

U+Es normal

Bilirubin 25 µmol/L (2-18)

AST 140IU/L (5-40)

Alanine transaminase 155 IU/L (5-40)

ALP 160 IU/L (50-110)

Random blood glucose 11.2 mmol/l (3.5-6)

Hepatitis A IgG positive

Hepatitis B and C screening negative

Anti-nuclear antibodies 1:16 titre

Ultrasound Abdomen reveals Hyperechogenic hepatic parenchyma

Liver Biopsy reveals lesions suggestive of alcoholic liver disease

On review of her notes, liver function tests performed 6 months previously showed similar values.

Which of the following is the most likely diagnosis?

- 1- Alcoholic liver disease
- 2- Autoimmune hepatitis
- 3- Non-alcoholic steatohepatitis

4- Primary biliary cirrhosis

5- Viral hepatitis

Answer & Comments

Answer: 3- Non-alcoholic steatohepatitis

This is a case of non-alcoholic steatohepatitis, the diagnosis of which is made only by histology of liver biopsy which shows lesions suggestive of ethanol intake in a patient known to consume less than 40g of alcohol per week. The diagnosis is supported by the presence of obesity, hyperglycaemia and hyperechogenic hepatic parenchyma. In alcoholic hepatitis, AST to ALT ratio is more than 1.



[Q: 847] OnExamination - Gastroenterology

A 61-year-old man has a 2 cm adenoma removed from his sigmoid colon. The biopsy results confirm an adenocarcinoma in situ with moderately differentiated dysplastic cells. The pathology report confirms total excision with clear resection margins.

What is the most appropriate follow up management for this patient?

- 1- Annual carcinoembryonic antigen (CEA)
- 2- Chemotherapy
- 3- No follow up
- 4- Regular follow up with colonoscopy
- 5- Regular follow up with no colonoscopy

Answer & Comments

Answer: 4- Regular follow up with colonoscopy

The first thing to note is the question is about planned management This patient has been picked up early and has had a tumour resected. His CEA would be normal and would not be expected to be elevated until the disease was quite established on the TNM

scale. However, this patients prognosis would be excellent, but he is by definition someone with increased risk. Therefore, he should continue to be reviewed with colonoscopy annually for at least two years.



[Q: 848] OnExamination - Gastroenterology

A 47-year-old man presents with confusion and drowsiness. A diagnosis of hepatic encephalopathy is suspected and treatment with lactulose is begun.

Which of the following concerning lactulose is true?

- 1- Absorbed from the gut
- 2- Causes hypermagnesaemia
- 3- Contraindicated in diabetes mellitus
- 4- Inhibits proliferation of ammonia-forming organisms in the gut
- 5- Reduces absorption of spironolactone

Answer & Comments

Answer: 4- Inhibits proliferation of ammonia-forming organisms in the gut

Lactulose, an osmotic diuretic causes hypomagnesaemia associated with diarrhoea, is not absorbed, does not affect the absorption of spironolactone and may be used in diabetics. It is used in patients with cirrhosis/hepatic encephalopathy to limit the proliferation of ammonia forming gut organisms and increase the clearance of protein load in the gut.



[Q: 849] OnExamination - Gastroenterology

Which of the following statements regarding jejunal biopsy is correct?

- 1- Electron microscopy is necessary to confirm the presence of villous atrophy

- 2- Sub-total villous atrophy is diagnostic of gluten-sensitive enteropathy and is not found in other conditions
- 3- It is contra-indicated over the age of 70 years
- 4- In tropical countries apparently healthy people have a mucosal structure which would be regarded as abnormal in Europe
- 5- It can be used to diagnose Whipple's disease

Answer & Comments

Answer: 5- It can be used to diagnose Whipple's disease

a- the villus atrophy may be seen with a magnifying glass

b- sub-total villus atrophy is seen in a number of conditions other than coeliac disease (i.e. Severe tropical sprue, cow's milk / soya sensitivity in children, gastroenteritis, Whipple's disease, hypogammaglobulinaemia, neomycin therapy, laxative abuse, Norwalk agent)

c- There is a group of patients who present with coeliac disease in older age, sometimes in their 90s. They present with iron deficiency anaemia, osteoporosis or weight loss.

d- They would not be 'healthy'.



[Q: 850] OnExamination - Gastroenterology

A 43-year-old female presents with abdominal pain and watery diarrhoea. She is taking ibuprofen for joint pains, and has been previously investigated for infertility. She was given a proton pump inhibitor by her GP for 6 weeks with no relief of her symptoms.

Investigations:

Haemoglobin	12.2g/dl
Calcium	2.86mmol/l
Albumin	42g/l

Phosphate 0.8mmol/l
 CRP 10mg/l
 Endoscopy multiple small duodenal ulcers
 H. pylori negative

What is the likely diagnosis?

- 1- Crohn's disease
- 2- Cushing's Syndrome
- 3- NSAID induced PUD
- 4- Multiple endocrine neoplasia
- 5- Small Bowel Lymphoma

Answer & Comments

Answer: 4- Multiple endocrine neoplasia

The CRP is not raised, making a diagnosis of Crohn's unlikely. The DUs have persisted despite a lengthy treatment with PPIs. Small bowel lymphoma is suggested by narrowing of the intestine lumen, resulting in paraumbilical pain, made worse by eating, with weight loss, vomiting and occasional intestinal obstruction. Small bowel lymphoma is diagnosed by contrast radiographs and intestinal biopsy. The most likely diagnosis here is MEN, likely to MEN1a (Wermer's Syndrome). Multiple DUs make a diagnosis of Zollinger Ellison's syndrome likely, due to Gastrinomas. Hypergastrinaemia may be the cause of the diarrhoea. There is also hypercalcaemia as a result of the parathyroid hyperplasia indicative of this condition. There may not necessarily be a family history, sporadic cases make up 10% of new cases. The infertility would fit with a prolactinoma.



[Q: 851] OnExamination - Gastroenterology

A 51-year-old male labourer presents with a haematemesis.

Which of the following features would categorise him into a high risk group?

- 1- A blood pressure of 134/88 mmHg

- 2- A pulse of 90 beats per minute
- 3- A plasma glucose of 7.2 mmol/l
- 4- A history of ischaemic heart disease
- 5- His age

Answer & Comments

Answer: 4- A history of ischaemic heart disease

There are a number of scoring systems which are available to stratify subjects with GI bleed in to high and low risk groups. The Rockall scoring system is based on age (higher the age the worse the prognosis), comorbidities (IHD), the presence of shock, and endoscopic abnormalities. The Canadian Consensus Conference Statement utilises a similar system incorporating Endoscopic factors including active bleeding, major stigmata of recent hemorrhage, ulcers greater than 2 cm in diameter, and the location of ulcers in proximity to large arteries. The Baylor Bleeding score attaches a score to pre- and post- endoscopic features. The Blatchford score is based on clinical parameters alone - elevated blood urea nitrogen, reduced haemoglobin, a drop in systolic blood pressure, raised pulse rate, the presence of melaena or syncope, and evidence of hepatic or cardiac disease



[Q: 852] OnExamination - Gastroenterology

A 19-year-old student presents with a fifteen week history of diarrhoea. He has lost 2 kg in weight, and has no recent travel abroad. A smear of a duodenal biopsy reveals many trophozoites.

What is the best treatment option?

- 1- Ciprofloxacin
- 2- Gluten free diet
- 3- Metronidazole
- 4- Prednisolone

5- Quinine

Answer & Comments

Answer: 3- Metronidazole

The diagnosis here is Giardiasis, caused by *Giardia lamblia*. *Giardia* has been reported as a cause of chronic diarrhoea. Most patients respond to oral metronidazole 250-400mg tds for 5 days.



[Q: 853] OnExamination -
Gastroenterology

A 29-year-old man presents with anaemia, bleeding tendency, diarrhoea and abdominal pain. Examination reveals a palpable mass in the right lower quadrant and anal skin tags.

What is the most likely underlying condition?

- 1- chronic pancreatitis
- 2- coeliac disease
- 3- crohn's disease
- 4- intestinal lymphoma
- 5- ulcerative colitis

Answer & Comments

Answer: 3- crohn's disease

Crohn's disease commonly presents with diarrhoea, abdominal pain and weight loss. It can affect the whole gastrointestinal tract, the commonest being ileocolitis. Anaemia is usually due to blood loss and less commonly B12/folate malabsorption. An abdominal mass is often palpable in presence of small bowel disease, which can lead to Vitamin K malabsorption. Anal tags, fissures, perianal fistulae and abscesses are associated with crohn's disease and not ulcerative colitis.



[Q: 854] OnExamination -
Gastroenterology

A woman had lunch at a Chinese restaurant. In the evening she presented with diarrhoea and

vomiting. There was no fever.

Which of the following is the likely cause of food poisoning in her case?

- 1- Bacillus cereus
- 2- Clostridium perfringens
- 3- Escherichia coli
- 4- Staphylococcus aureus
- 5- Yersinia enterocolitica

Answer & Comments

Answer: 1- Bacillus cereus

Bacillus cereus food poisoning is the general description, although two recognized types of illness are caused by two distinct metabolites. The diarrhoeal type of illness is caused by a large molecular weight protein, while the vomiting (emetic) type of illness is believed to be caused by a low molecular weight, heat-stable peptide. The onset of watery diarrhoea, abdominal cramps, and pain occurs 6-15 hours after consumption of contaminated food. Symptoms usually persist for 24 hours. The emetic type of food poisoning is characterized by nausea and vomiting within 0.5 to 6 hours after consumption of contaminated foods. Occasionally, abdominal cramps and/or diarrhoea may also occur. Duration of symptoms is generally less than 24 hours.

A wide variety of foods including meats, milk, vegetables, and fish have been associated with the diarrhoeal type food poisoning. The vomiting-type outbreaks have generally been associated with rice products. *Staphylococcus aureus* and *Clostridium perfringens* are associated with meat and *Yersinia enterocolitica* with milk



[Q: 855] OnExamination -
Gastroenterology

Which of the following is the commonest cause of traveller's diarrhoea?

- 1- Escherichia coli

- 2- Entamoeba histolytica
- 3- Giardia lamblia
- 4- Shigella flexneri
- 5- Yersinia enterocolitica

Answer & Comments

Answer: 1- Escherichia coli

Enterotoxigenic E Coli is the commonest cause of travellers diarrhoea and is usually a self limiting condition. Usually no treatment nor investigation is required for this brief diarrhoeal illness. Other causes that may be associated with prolonged diarrhoea include Giardia and amoebiasis. Chronic diarrhoea merits investigation.



[Q: 856] OnExamination - Gastroenterology

Which ONE statement is true regarding the treatment of iron deficiency anaemia:

- 1- iron is absorbed in the distal jejunum
- 2- absorption of iron is increased by ascorbic acid
- 3- sustained release iron is a useful way of giving larger doses
- 4- ferrous sulphate 200mg has less elemental iron than the same dose of ferrous gluconate
- 5- parenteral iron is indicated when the anaemia responds slowly to oral iron

Answer & Comments

Answer: 2- absorption of iron is increased by ascorbic acid

- 1 - iron is absorbed in the upper small intestine.
- 2 - absorption of oral iron is improved by ascorbic acid.

3 - sustained release preparations may improve tolerance of oral iron but do not aid absorption.

4 - ferrous sulphate has more elemental iron by mass.

5 - parenteral iron acts no faster than oral iron. It is indicated when oral iron cannot be tolerated or is not absorbed.



[Q: 857] OnExamination - Gastroenterology

A 65-year-old man was investigated for weight loss and dyspepsia. Endoscopic examination revealed an ulcerated lesion in the stomach and biopsy revealed the presence of a low grade mucosa-associated lymphoma with Helicobacter pylori. Further investigation with CT of chest and abdomen were normal as were bone marrow aspirate and trephine.

What is the best treatment option for this patient?

- 1- Eradication therapy for Helicobacter pylori
- 2- IV chemotherapy
- 3- Oral chlorambucil
- 4- Partial gastric resection
- 5- Radiotherapy

Answer & Comments

Answer: 1- Eradication therapy for Helicobacter pylori

This is a gastric MALT tumour. These are usually marginal zone B cell lymphomas and associated with an excellent prognosis. Low grade gastric MALT tumours associated with Helicobacter Pylori infection respond in over 80% to helicobacter eradication as the primary mode of treatment. Radiotherapy is considered but generally unnecessary.



[Q: 858] OnExamination -
Gastroenterology

A 24-year-old woman was referred with tiredness and intermittent bloody diarrhoea and a past history of cerebral venous thrombosis.

On examination, the sclera of the right eye was inflamed, and multiple mouth ulcers were noted. At the colonoscopy, which confirmed colitis, two large vulval ulcers were noted.

Which is the most likely diagnosis?

- 1- Behcet's disease.
- 2- Crohn's disease.
- 3- HIV infection
- 4- Syphilis
- 5- Ulcerative colitis.

Answer & Comments

Answer: 1- Behcet's disease.

A classical description of the presentation of Behcet's, with oral and genital ulceration, colitis and scleritis.



[Q: 859] OnExamination -
Gastroenterology

Which ONE of the following statements regarding colon cancer is correct:

- 1- In non-familial cases, gene mutations in the cancer cells are unusual
- 2- In familial cases the inheritance pattern is typically autosomal recessive
- 3- It occurs most commonly in the ascending colon
- 4- It is a characteristic feature of the Peutz-Jegher syndrome
- 5- In familial polyposis coli the increased cancer risk is due to inheritance of a mutated suppressor gene

Answer & Comments

Answer: 5- In familial polyposis coli the increased cancer risk is due to inheritance of a mutated suppressor gene

A- Quantitative and qualitative alterations in gene expression accumulate in colorectal cancer cells. These include alterations of pro-oncogene expression and chromosomal abnormalities (deletions at 17p and 18q are seen in 70% of colorectal carcinomas).

B- Both familial polyposis coli and Gardner's syndrome are autosomal dominant.

C- The rectum and sigmoid colon are the commonest sites.

D- Peutz-Jegher's syndrome is dominantly inherited pigmentation of skin and mucous membranes, and hamartomatous polyps in the stomach and larger intestine. The polyps only rarely undergo malignant change.

E- An allelic deletion of a putative tumour suppressor gene located 5q21-q22. FAP is an autosomal dominant disorder causing extensive adenomatous polyps of the colon and early onset colorectal cancer.



[Q: 860] OnExamination -
Gastroenterology

A 40-year-old man has a history of left-sided Crohn's colitis. Though, previously treated with steroids and mesalazine, he has had several relapses in the past year. The last relapse, treated with high doses of steroids, was complicated by gastric bleeding.

Investigations show:

Haemoglobin 10.8 g/L (13.0-18.0)

MCV 76 fL (80-96)

MCH 24 pg (28-32)

WBCs $10 \times 10^9/L$ (4-11)

Platelets $400 \times 10^9/L$ (150-400)

Serum total protein 70 g/L (61-76)

Serum albumin 30 g/L (37-49)

Serum CRP 30 mg/L(<10)

Abdo X-ray normal

Which of the following is the most appropriate management?

- 1- A trial of oral metronidazole for three months.
- 2- Total colectomy with ileostomy construction.
- 3- Total colectomy with pouch construction.
- 4- Treatment with azathioprine.
- 5- Treatment with oral budesonide.

Answer & Comments

Answer: 4- Treatment with azathioprine.

This patient has all the hallmarks of active Crohn's colitis that is failing to settle with first-line medical therapy.

The next step is a trial of azathioprine, which is used as a steroid-sparing agent. This is particularly relevant to this particular patient, as he has had a serious side-effect from previous steroid treatment. Metronidazole is rarely effective in the treatment of active Crohn's colitis. Given that Crohn's disease can recur following surgery, an operation should not be embarked upon without first a trial of the second-line medical therapies such as azathioprine, its metabolite 5-mercaptopurine, or infliximab.



[Q: 861] OnExamination - Gastroenterology

A 58-year-old man complains of tiredness, fever, weight loss, arthralgia and diarrhoea. Jejunal biopsy reveals flattened mucosa containing periodic acid-Schiff (PAS) positive macrophages.

What is the most likely diagnosis?

- 1- coeliac's disease
- 2- tuberculosis

- 3- tropical sprue
- 4- parasitic infection
- 5- whipple's disease

Answer & Comments

Answer: 5- whipple's disease

Whipple's disease is rare and affects most commonly middle-aged males. It can affect any organ, but dominated by involvement of small bowel, causing malabsorption. The organism (*Tropheryma whipplei*) can be identified both between and within abnormal macrophages, which stain magenta with PAS. Treat with prolonged antibiotics eg parenteral penicillin and streptomycin for 2 weeks, followed by 1 year of doxycycline.



[Q: 862] OnExamination - Gastroenterology

A 48-year-old woman complains of pruritis, steatorrhoea and bruising. On examination, she is jaundiced, pigmented with spider naevi and hepatosplenomegaly.

What is the most likely underlying diagnosis?

- 1- autoimmune hepatitis
- 2- primary biliary cirrhosis
- 3- alcoholic liver disease
- 4- alpha-1 antitrypsin deficiency
- 5- Wilson's disease

Answer & Comments

Answer: 2- primary biliary cirrhosis

She has clinical evidence of chronic liver disease and portal hypertension. The 2 main conditions causing pigmentation and chronic liver disease are primary biliary cirrhosis (PBC) and haemochromatosis. PBC is a chronic cholestatic inflammatory liver disease, the aetiology of which is probably autoimmune. It most commonly affects middle-aged women. There is jaundice with skin pigmentation, risk

of developing oesophageal varices and fat malabsorption, leading to deficiency of the vitamins A, D, E, K (hence osteomalacia and also bruising). Serum antimitochondrial antibody is positive in 95-99% cases.



[Q: 863] OnExamination - Gastroenterology

A 35-year-old woman with alcoholic cirrhosis is admitted with deteriorating encephalopathy and abdominal discomfort. An ascitic tap revealed a polymorphonuclear cell count of 350 cells per mm³.

Which of the following is the most appropriate therapy?

- 1- Intravenous amoxicillin
- 2- Intravenous cefotaxime
- 3- Intravenous metronidazole
- 4- Oral neomycin
- 5- Oral norfloxacin

Answer & Comments

Answer: 2- Intravenous cefotaxime

This lady has Spontaneous Bacterial Peritonitis as suggested by the typical history, ascites and raised polymorphonuclear count within the ascitic tap. It is most commonly seen in alcoholic cirrhosis and the causative organism is usually *Escherichia coli*, *Klebsiella*, *S. Pneumoniae* or *Enterococci*. (Compare this with the mixed growth seen in other forms of peritonitis). Sending some ascitic fluid in blood culture bottles increases the yield. Initial treatment is with broad spectrum antibiotics such as cefotaxime. Norfloxacin is recommended for short term prophylaxis.



[Q: 864] OnExamination - Gastroenterology

A 69-year-old male is seen in Outpatients. He reports weight loss of 1 stone over 3 months but his history is otherwise unremarkable. On

examination his abdomen is soft with no palpable masses.

A PR examination is normal.

His blood tests show:

Haemoglobin 8.0g/dl (12-16)

MCV 70fl (85-95)

Which of the following is the most appropriate investigation for this patient?

- 1- Abdominal X-ray and colonoscopy
- 2- CT scan of the abdomen and upper GI endoscopy
- 3- Sigmoidoscopy upper GI endoscopy
- 4- Ultrasound scan of abdomen and colonoscopy
- 5- Upper GI endoscopy and colonoscopy

Answer & Comments

Answer: 5- Upper GI endoscopy and colonoscopy

This man has weight loss and an unexplained microcytic anaemia. The likely site of blood loss is from the GI tract in absence of an alternative explanation. This may be due to an occult GI malignancy and, therefore, the initial investigations of choice are upper and lower GI endoscopy.



[Q: 865] OnExamination - Gastroenterology

In the diarrhoea associated with cholera toxin, there is activation of which of the following enzyme systems?

- 1- Adenylate cyclase.
- 2- ATP.
- 3- Guanylate cyclase.
- 4- Na-glucose co-transporter.
- 5- Na⁺/K⁺ ATPase pump.

Answer & Comments

Answer: 1- Adenylate cyclase.

Cholera toxin has two parts, A and B. B binds while A activates G protein, which activates adenylate cyclase. Elevated CAMP results in unrestricted chloride secretion from villous crypts.



[Q: 866] OnExamination - Gastroenterology

Which of the following statements is correct of hepatitis C virus infection?

- 1- Cell cultures of virus are routinely used to assess response to drug therapy
- 2- High antibody titres are an indication for therapy
- 3- Less than 5% of cases lead to chronic infection
- 4- More likely to be transmitted by the sexual route than hepatitis B virus
- 5- Treatment with ribavirin and interferon alpha is more effective than interferon alpha alone

Answer & Comments

Answer: 5- Treatment with ribavirin and interferon alpha is more effective than interferon alpha alone

In hepatitis C infection the criteria for treatment are abnormal liver function tests and detectable hepatitis C RNA in plasma, with evidence of moderate inflammation on liver biopsy. Response to therapy is determined by normalisation of hepatic transaminases and undetectability of hepatitis C RNA in plasma. Hepatitis C is generally transmitted by inoculation or vertically from mother-to-child. In contrast to hepatitis B, sexual transmission is uncommon. Around 85% of acute hepatitis C infections lead to chronic infection. Treatment with interferon alpha alone has around a 10-15% success rate

in achieving long-term undetectability of plasma hepatitis C RNA. Combination treatment with ribavirin and interferon alpha has been found to have approximately a 45% success rate.



[Q: 867] OnExamination - Gastroenterology

A 33-year-old man with chronic hepatitis C is admitted with general deterioration. He has missed many of his previous outpatient appointments and currently is not receiving any treatment. On examination he is generally unwell with a temperature of 37.8C, blood pressure of 110/72 mmHg and appears jaundiced. His investigations reveal:

Serum Na 133 mmol/l

Serum potassium 4.3 mmol/l

Serum Urea 21 mmol/l

Serum Creatinine 336 micromol/l

bilirubin 78 micromol/l (10-20)

AST 92 iu/l (10-40)

Alk Phosphatase 267 (50-100)

Albumin 30 (33-42)

Urine sodium 15 mmol/l

What is the likely diagnosis?

- 1- Abdominal tuberculosis
- 2- Hepatocellular carcinoma
- 3- Hepatorenal syndrome
- 4- Mixed essential cryoglobulinaemia
- 5- Spontaneous bacterial peritonitis

Answer & Comments

Answer: 3- Hepatorenal syndrome

The abnormal urea and creatinine plus the low urine sodium suggest a diagnosis of hepatorenal syndrome. Fluid balance is very difficult in these patients but some respond to treatment with IV glypressin which improves kidney perfusion.



[Q: 868] OnExamination -
Gastroenterology

A 16-year-old boy with cystic fibrosis presents with abdominal pain.

Which of the following is most likely to be the cause?

- 1- Ulcerative colitis
- 2- Irritable Bowel Syndrome
- 3- Pyelonephritis
- 4- Meconium Ileus Equivalent Syndrome
- 5- Renal Calculi

Answer & Comments

Answer: 4- Meconium Ileus Equivalent Syndrome

Meconium ileus equivalent or distal intestinal obstruction syndrome occurs in older children and adults with CF and presents with colicky abdominal pain, distension, vomiting and failure to pass faeces. The plain AXR confirms small bowel obstruction. Initial management includes rehydration with IV fluids and oral N-acetyl cysteine. Other GI complications of / associations with CF include liver cirrhosis, gall bladder disease, pancreatitis, peptic ulceration, hiatus hernia, coeliac disease and Crohns disease.



[Q: 869] OnExamination -
Gastroenterology

A 25-year-old man, who had a long history of heavy alcohol intake is admitted with nausea and frequent vomiting four hours after a meal in a restaurant. During review in the A+E he vomits a cupful of blood.

What is the cause of his haemetemesis?

- 1- duodenal ulceration
- 2- Haemorrhagic Gastritis
- 3- Mallory-Weiss tear
- 4- oesophageal varices
- 5- oesophagitis

Answer & Comments

Answer: 3- Mallory-Weiss tear

Persistent vomiting can eventually lead to small tears in the oesophagus leading to the vomiting of red blood. Varices would produce large volumes of blood (much more than just a cupful).



[Q: 870] OnExamination -
Gastroenterology

A routine ultrasound at 18 weeks gestation in a diabetic mother reveals a male foetus with an endocardial cushion defect. Other abnormalities include increased nuchal thickening and a "double bubble" sign.

Which of the following conditions is most likely to have contributed to this set of findings:

- 1- Maternal use of ACE inhibitor
- 2- Marfan syndrome
- 3- Maternal folate deficiency
- 4- Trisomy 21
- 5- Congenital syphilis

Answer & Comments

Answer: 4- Trisomy 21

Diabetic mothers are more likely to have children with congenital abnormalities depending on pre-conception, and first trimester blood sugar control. 40% of Down's syndrome babies have atrioventricular septal defects as in this foetus. The double bubble sign suggests duodenal atresia which again suggests Down's syndrome. GI malformations occur in 6% of Down's patients - most commonly duodenal atresia and Hirschsprungs disease.



[Q: 871] OnExamination -
Gastroenterology

An 80-year-old female presents with confusion associated with a chest infection.

She received standard treatment, and four days later she developed green, then bloody diarrhoea.

Which of the following organisms is most likely to be responsible for her diarrhoea?

- 1- Campylobacter jejuni
- 2- Clostridium difficile
- 3- Escherichia coli 0157
- 4- Methicillin-resistant Staphylococcus aureus
- 5- Vancomycin-resistant enterococcus

Answer & Comments

Answer: 2- Clostridium difficile

This is typical of Clostridium infection with pseudomembranous colitis induced by prior treatment with broad spectrum antibiotics such as cefuroxime, augmentin and the macrolides. It is treated with oral vancomycin/metronidazole.



[Q: 872] OnExamination - Gastroenterology

45-year-old gentleman presents with dyspepsia of 5 months duration and loss of weight. Examination reveals mild pallor and slight epigastric tenderness. Gastroscopy reveals 5-mm posterior ulcer in the first part of duodenum and 2-cm mass on lesser curve of the stomach. Biopsy of the mass reveals mucosa-associated lymphoid tumour confined to gastric mucosa. He has tested positive for H. pylori infection.

Which of the following treatment options will be appropriate for him?

- 1- Chemotherapy
- 2- H. Pylori eradication
- 3- Proton pump inhibitor
- 4- Radiotherapy
- 5- Surgery

Answer & Comments

Answer: 2- H. Pylori eradication

Lymphomas restricted to the gastric mucosa usually disappear when H. pylori is eradicated. These lesions are less likely to respond to H. pylori eradication alone if they extend beyond the gastric mucosa. Chemotherapy or surgical excision may then be indicated. Duodenal ulcer will also disappear with H. pylori eradication.



[Q: 873] OnExamination - Gastroenterology

A 63-year-old patient with known alcohol related cirrhosis presented with ascites, abdominal tenderness and peripheral oedema. A diagnostic tap revealed a neutrophil count of 400/ mm³ (normal <250/mm³).

Which of the following would be of most immediate benefit?

- 1- fluid restriction and a no added salt diet
- 2- intravenous antibiotics
- 3- oral spironolactone
- 4- therapeutic paracentesis
- 5- trans-jugular intrahepatic porto-systemic shunt

Answer & Comments

Answer: 2- intravenous antibiotics

This man has spontaneous bacterial peritonitis (SBP). Appropriate treatment is IV antibiotics. He is likely to have a decreased intravascular volume and require IV albumin as volume expansion. Fluid restriction, diuretics, or large volume paracentesis are likely to cause further hypovolaemia and precipitate renal failure. There is no stated indication for a TIPSS, indications are: diuretic resistant ascites, intractable portal hypertensive bleeding and hepato-renal failure.



[Q: 874] OnExamination -
Gastroenterology

Which of the following statements is characteristic of acute hepatitis B infection?

- 1- Most patients present with splenomegaly.
- 2- It confers immunity to hepatitis A.
- 3- It commonly presents with distal joint arthritis.
- 4- There is increased infectivity in the presence of the Hep B e antigen.
- 5- Pruritis is an important early symptom.

Answer & Comments

Answer: 4- There is increased infectivity in the presence of the Hep B e antigen.

Clinical features of hepatitis B are as follows:

1. Most are asymptomatic.
2. Symptoms: Lethargy, anorexia, arthralgia, rash (any type), papular acrodermatitis (Gianotti Crosti), polyarthritis, glomerulonephritis, aplastic anaemia. 25 % have jaundice.
3. Complications: ?Acute fulminant hepatitis. ?Chronic hepatitis. ?Membranous glomerulonephritis. Hepatitis E antigen is present in the acute phase and indicates a highly infectious state. Pruritis is characteristic of chronic hepatitis.



[Q: 875] OnExamination -
Gastroenterology

A 58-year-old man presents to your clinic with dysphagia for solids for the past three months. He also complains of weight loss and loss of appetite. There is no other past medical history, apart from symptoms of indigestion and heartburn for the past five years. He regularly takes Gaviscon and Rennie tablets. He is a heavy smoker and a regular drinker. He undergoes endoscopy, which reveals a small tumour at the lower end of the oesophagus.

What is the most likely aetiological cause for the tumour?

- 1- Alcohol
- 2- Barrett's oesophagus
- 3- Helicobacter pylori
- 4- Oesophageal candidiasis
- 5- Oesophageal pouch

Answer & Comments

Answer: 2- Barrett's oesophagus

The history is suggestive of gastro oesophageal reflux for the past 5 years, which can predispose to columnization of the oesophageal mucosa known as Barrett's oesophagus, this is a premalignant state and 3 yearly surveillance endoscopies are recommended. The development of dysphagia for solids and weight loss suggests the development of oesophageal carcinoma.



[Q: 876] OnExamination -
Gastroenterology

An asymptomatic 40-year-old female underwent an abdominal ultrasound scan as part of a clinical trial and was noted to have gallstones but entirely normal liver function tests.

Which one of the following is the most appropriate management?

- 1- Chenodeoxycholic acid
- 2- Laparoscopic cholecystectomy
- 3- Lithotripsy
- 4- Observation
- 5- Ursodeoxycholic acid

Answer & Comments

Answer: 4- Observation

This patient is asymptomatic and does not require any treatment at present. If it ain't broken don't fix it is the general rule. There is

no proven role for the use of oral drugs to try and reduce the formation of gallstones. The only definitive treatment would be a cholecystectomy but that is not generally offered for asymptomatic gallstones.



[Q: 877] OnExamination -
Gastroenterology

A 50-year-old ex-footballer with a long history of alcohol excess presents with epigastric pain.

Which of the following suggests a diagnosis of peptic ulceration rather than chronic pancreatitis?

- 1- Back pain
- 2- Exacerbation with alcohol
- 3- Loose stool
- 4- Relieved by food
- 5- Weight loss

Answer & Comments

Answer: 4- Relieved by food

Relief with food suggests peptic (and specifically) duodenal ulceration. It is likely that food would precipitate the pain of chronic pancreatitis.

Loose stool is suggestive of pancreatitis/malabsorption. Pain referred to the back occurs in both situations and hence not suggestive.

Weight loss can occur in both gastric ulcers and pancreatitis and not very suggestive. Alcohol may well exacerbate both types of pain.



[Q: 878] OnExamination -
Gastroenterology

A 60-year-old woman with known alcoholic liver cirrhosis presents with vague abdominal pains, malaise and nausea. She has been abstinent since she was diagnosed eight

months ago. On examination she had moderate ascites and mild, generalised abdominal tenderness.

Investigations

Haemoglobin 11.2 g/dL (11.5 - 16.5)

WCC $15 \times 10^9/L$ (4 - 11)

prothrombin time 21 s (<15s)

serum albumin 28 g/L (37 - 49)

serum total bilirubin 56 $\mu\text{mol/L}$ (1 - 22)

ascitic fluid protein 26 g/L

ascitic fluid amylase normal

ascitic fluid white cell count $500 \times 10^9/L$

What is the most likely reason for her current problem?

- 1- hepatic vein thrombosis
- 2- pancreatic pseudocyst rupture
- 3- portal vein thrombosis
- 4- primary liver cancer
- 5- spontaneous bacterial peritonitis

Answer & Comments

Answer: 5- spontaneous bacterial peritonitis

The high white cell count in the ascites makes spontaneous bacterial peritonitis (SBP) much more likely than Budd Chiari Syndrome (BCS), PVT, HCC, or a ruptured pancreatic pseudocyst. Abdominal pain is often only mild, or even absent in SBP, with patients often presenting with otherwise unexplained hepatic decompensation.



[Q: 879] OnExamination -
Gastroenterology

A 32-year-old female presents with pruritis and jaundice. She is 30 weeks gestation in her first pregnancy. Two weeks earlier she had been treated by the ENT surgeons after presenting to A+E with intractable nose bleeds.

The Liver Function Tests are shown below:

ALT 72 U/L (5-40)
 Alkaline phosphatase 700 U/L (30-110)
 Bilirubin 80 μ mol/L (1-18)
 Serum bile acids 100 times normal titre.

Which of the following statements is correct concerning this patient?

- 1- ALP does not increase in a normal pregnancy
- 2- Maternal hepatic blood flow does not increase in pregnancy
- 3- Treatment options include IV N-acetylcysteine
- 4- Varices are diagnostic of liver disease in pregnancy
- 5- Viral hepatitis is the likely diagnosis

Answer & Comments

Answer: 2- Maternal hepatic blood flow does not increase in pregnancy

The diagnosis here is Intrahepatic Cholestasis which presents with markedly elevated serum bile acids (cholelyglycine). It presents in the 2nd or 3rd trimester, and usually the alkaline phosphatase is 7-10 times normal, with raised ALT, AST and bilirubin. Cardiac output and blood volume increase in pregnancy, but hepatic blood flow does not. Treatment options include ursodeoxycholic acid, cholestyramine, Phenobarbital and vitamin K to treat the coagulopathy. ALP rises in pregnancy but not to this extent. The placenta is the source of the raised ALP. Viral hepatitis is the commonest cause of jaundice in pregnancy, but the elevated bile acids make this unlikely in this case.



[Q: 880] OnExamination - Gastroenterology

Which of the following is most likely to be reversible following venesection in a 45-year-old male with haemochromatosis?

- 1- Arthropathy
- 2- Cardiomyopathy
- 3- Cirrhosis
- 4- Diabetes Mellitus
- 5- Hypopituitarism

Answer & Comments

Answer: 2- Cardiomyopathy

Disorders that are potentially reversible in haemochromatosis include the dermal pigmentation and cardiomyopathy. Similarly there are improvements in LFTs. However, diabetes, cirrhosis, hypogonadism and arthropathy are usually irreversible.



[Q: 881] OnExamination - Gastroenterology

A 56-year-old man from Thailand presented with abdominal pain and a mass in the right upper quadrant. He reported that he had been diagnosed with viral hepatitis several years previously.

Investigations showed:

Serum alpha-fetoprotein 13,500 IU/L (< 10)

What is the most likely underlying viral infection?

- 1- Hepatitis A virus
- 2- Hepatitis B virus
- 3- Hepatitis C virus
- 4- Hepatitis D virus
- 5- Hepatitis E virus

Answer & Comments

Answer: 2- Hepatitis B virus

Very difficult! The patient has chronic viral hepatitis and presents with a hepatoma. The underlying cause must be either HBV or HCV. There is a higher prevalence of HBV in the Far East and since his country of origin is the only

other detail that gives a clue to the cause of his hepatitis, the most likely viral agent is HBV.



[Q: 882] OnExamination -
Gastroenterology

Which of the following is true concerning a hepatitis E infection?

- 1- It can be transmitted with hepatitis B.
- 2- It is a recognised cause of chronic liver disease.
- 3- CT scan of the liver with contrast shows diagnostic appearances.
- 4- The incidence of chronic liver disease is reduced by administration of alpha interferon.
- 5- It does not result in a carrier state.

Answer & Comments

Answer: 5- It does not result in a carrier state.

Five hepatitis viruses form a heterogeneous group causing similar clinical illnesses. Hepatitis A, C, D, and E are all RNA viruses coming from 4 different families; and hepatitis B is a DNA virus. Hepatitis A & E cause acute illness, with the former causing most hepatitis in childhood and hepatitis E being very rare. Hepatitis B, C, and D cause chronic morbidity and mortality, with B causing a third of cases, hepatitis C a fifth of cases, and D being very rare. Hepatitis D illness cannot occur without B as a helper virus. Hepatitis B can be treated with interferon-alpha, which improves liver disease.



[Q: 883] OnExamination -
Haematology

A 20-year-old man presented to hospital two days after returning from visiting his family in Bangladesh. Within a day of his return to the UK, he suddenly developed profuse watery diarrhoea.

He says there had been an outbreak of diarrhoea in his family's village in the week before his return.

Stool culture revealed a growth of *Vibrio cholerae*.

Which one of the following blood types is associated with the greatest susceptibility to severe cholera?

- 1- Blood Group A
- 2- Blood Group AB
- 3- Blood Group B
- 4- Blood Group O
- 5- Rhesus -ve

Answer & Comments

Answer: 4- Blood Group O

"Individuals with blood group O are more susceptible than other individuals to severe cholera, although the mechanism underlying this association is unknown."

Infect Immun. 2005 Nov;73(11):7422-7



[Q: 884] OnExamination -
Haematology

A 36-year-old female who is on warfarin after suffering a deep vein thrombosis, presents with an INR of 8.2 and a conjunctival haemorrhage.

The blood pressure is 125/55 mmHg, heart rate is 65 bpm and the ECG reveals a normal sinus rhythm.

Which of the following is the most appropriate treatment for this patient?

- 1- FFP
- 2- Factor VII
- 3- Oral vitamin K 1mg
- 4- Prothrombin complex concentrate
- 5- Stop warfarin only

Answer & Comments

Answer: 3- Oral vitamin K 1mg

A conjunctival bleed is defined as a minor bleed, and current guidelines suggest that oral or IV vitamin K together with the omission of warfarin, is the treatment of choice. Local guidelines should also be available. One must always weigh up the risks and benefits of reversing the anticoagulation. The patient described is at low risk if the warfarin induced coagulopathy is reversed. There is no suggestion from the ECG and the haemodynamic status that there is pulmonary embolus.

Major bleeds are defined as intraorbital, intracranial, retroperitoneal or muscular bleeding causing compartment syndrome. Any acute bleeding with BP<90mmHg, oliguria or Hb drop to less than 9g/l, also count as major bleeding episodes and require aggressive reversal of the coagulopathy with vitamin K, stopping warfarin and prothrombin complex concentrate or FFP.



[Q: 885] OnExamination -
Haematology

A 72-year-old male presents with a five day history of cough, dyspnoea and fever. His chest X-ray shows a left basal consolidation.

His Full Blood Count shows:

- Haemoglobin 11 g/dL (13.0-16.5)
- White cell count $30 \times 10^9/L$ (4-11)
- Neutrophils $10 \times 10^9/L$ (2-7)
- Lymphocytes $20 \times 10^9/L$ (1-4)
- Monocytes $1 \times 10^9/L$ (0-0.8)

Eosinophils $0.4 \times 10^9/L$ (0.04-0.4)

Basophils $0.1 \times 10^9/L$ (0-0.1)

Which one of the following is the most appropriate test to establish the diagnosis?

- 1- Bone marrow aspirate
- 2- Bone marrow cytogenetics
- 3- CT abdomen
- 4- Immunophenotyping of white cells
- 5- Sputum cytology and AFB

Answer & Comments

Answer: 4- Immunophenotyping of white cells

Apart from the mild neutrophilia, which could be explained by the infection, the significant abnormality on the FBC is the lymphocyte count. Such a high lymphocyte count could be suggestive of a lymphoproliferative disorder such as chronic lymphocytic leukaemia. The best way to diagnose these is immunophenotyping of the blood- non invasive and will give a diagnosis.

The patient may have lymphadenopathy, splenomegaly- which would show on CT, but no diagnosis can be made from this. A bone marrow is invasive, and the BM is sometimes not involved in low grade lymphoproliferative disorders and similarly there may be no cytogenetic abnormality.

The FBC is not suggestive of TB or malignancy, therefore sputum examination would not be useful.



[Q: 886] OnExamination - Haematology

An 84-year-old woman presented with tiredness. On examination, she was anaemic but had no palpable splenomegaly. Investigations revealed a haemoglobin of 9.7 g/dL (11.5 - 16.5). She was commenced on oral iron therapy for one month and her haemoglobin remained unchanged. Further investigations revealed:

MCV 102 fL (80 - 96)

blood film marked anisopoikilocytosis

serum ferritin 70 ug/L (15 - 300)

Vitamin B₁₂ 280 ng/L (160 - 760)

red cell folate 230 ug/L (160 - 640)

serum urea 9.1 mmol/L (2.5-7.5)

serum creatinine 150 umol/L (60 - 110)

What is the most likely diagnosis?

- 1- aplastic anaemia
- 2- anaemia due to renal disease
- 3- hypothyroidism
- 4- iron deficiency anaemia
- 5- sideroblastic anaemia

Answer & Comments

Answer: 5- sideroblastic anaemia

Idiopathic sideroblastic anaemia is a member of the myelodysplastic syndromes. In this condition, the red blood cells are normal or macrocytic and there is anisocytosis and poikilocytosis on the peripheral films. This isn't iron deficiency anaemia as the ferritin is normal and a microcytic anaemia would be expected. A normochromic normocytic anaemia is expected in renal disease (epo deficiency). Hypothyroidism may cause a slight elevation of MCV but no anisopoikilocytosis is evident.



[Q: 887] OnExamination - Haematology

A 26-year-old man presents with dark urine, especially in the early morning. Further investigations show that he has haemoglobinuria and haemolytic anaemia. A diagnosis of paroxysmal nocturnal haematuria is made.

What is the likely mechanism underlying this condition?

- 1- aberrant fusion of 2 genes

- 2- impaired protein degradation
- 3- over expression of cellular oncogene
- 4- post-translational modification
- 5- telomere shortening

Answer & Comments

Answer: 4- post-translational modification

Posttranslational modification by the GPI glycolipid anchor is essential for the surface expression of many membrane proteins. Defect of GPI biosynthesis due to somatic mutation in the hematopoietic stem cell is the basis for an acquired genetic disease, paroxysmal nocturnal haemoglobinuria. The other mechanisms are associated with various other diseases.



[Q: 888] OnExamination -
Haematology

Concerning immune cell antigen receptors, which of the following statements is false?

- 1- Affinity maturation of the B-cell receptor is an important process initiated during the primary immune response
- 2- IgD are surface receptors of B-lymphocytes
- 3- In normal individuals T- lymphocytes with T-cell receptors (TCR) that recognize auto-antigens are all deleted to prevent autoimmunity
- 4- TCRs with different antigen specificities can be co-expressed on a single T lymphocytes
- 5- The antigen specificity of the T-cell receptor is generated during development

Answer & Comments

Answer: 3- In normal individuals T-lymphocytes with T-cell receptors (TCR) that recognize auto-antigens are all deleted to prevent autoimmunity

T- and B-lymphocytes express receptors on their surface that recognise antigen in a

specific manner. Each individual lymphocyte expresses a single type of receptor with unique specificity. The receptor on the B-lymphocyte is membrane bound immunoglobulin (IgM and IgD isotype) and recognises particulate antigen, whilst the TCR is a heterodimer that recognise peptide fragments presented by MHC molecules.

The antigen specificity of T- and B- cells is generated during development by recombination of gene segments encoding the variable domains (antigen recognition domains) of immune receptors. These gene recombinations are random and maturing lymphocytes that express auto-reactive receptors are then deleted or rendered anergic.

These processes take place in the thymus (T-lymphocytes) and in the bone marrow (B-lymphocytes). However, not all autoreactive lymphocytes are deleted during development. In the case of T-lymphocytes, not all proteins are expressed in the thymus, and those that are present only in the periphery or at certain stages of development will encounter mature T-cells that can respond to them. Thus, autoreactive T-cells exist in the periphery and other mechanisms are responsible for the protection of the body against autoimmunity. Affinity maturation refers to the process of progressive development of immunoglobulin with higher affinity to the antigen. This occurs in the germinal centres of lymphoid organs during the evolution of the humoral response and is accomplished by hypermutation of the variable region genes. T-cells with dual specificities have been reported although their function is unknown.



[Q: 889] OnExamination -
Haematology

In porphyria, which of the following is least likely to precipitate an acute attack:

- 1- Menstruation
- 2- Aspirin

- 3- Phenytoin
- 4- Thiopentone
- 5- Starvation

Answer & Comments

Answer: 2- Aspirin

Porphyria is a group of diseases characterised by excess production and excretion of porphyrins and their precursors. They are caused by enzyme defects within the haem metabolic pathway. Stress, infection, pregnancy, menstruation, starvation and certain drugs may precipitate acute attacks. Definite precipitants include sulphonamides, barbiturates and phenytoin.



[Q: 890] OnExamination - Haematology

Anti-neutrophilic cytoplasmic autoantibodies:

- 1- positive only in Wegener's syndrome associated with renal disease
- 2- cause neutropenia in SLE
- 3- present in inflammatory bowel disease
- 4- increased in systemic lupus erythematosus
- 5- ANCA positive glomerulonephritis characteristically causes nephrotic syndrome

Answer & Comments

Answer: 3- present in inflammatory bowel disease

85% of untreated subjects with Wegener's will have c-ANCA, and those with limited disease are less likely to have positive serology. p-ANCA is present in approximately 70% with ulcerative colitis and less than 20% of Crohn's patients. Neither p nor c-ANCA is typical of SLE. Initial renal damage causes proteinuria (focal proliferative glomerulonephritis) but renal function can deteriorate rapidly, with

development of acute focal necrotising glomerulonephritis).



[Q: 891] OnExamination - Haematology

A 28-year-old pregnant woman is being treated for a deep vein thrombosis with unfractionated heparin.

A recent blood test shows:

Haemoglobin 9.8 g/dL

White Cell Count $9.5 \times 10^9/L$

Platelets $35 \times 10^9/L$

What would be the best course of action for this woman?

- 1- Change to hirudin
- 2- Change to low molecular weight heparin
- 3- Change to warfarin
- 4- Danaparinoid
- 5- No change in treatment and observe

Answer & Comments

Answer: 4- Danaparinoid

This patient appears to have Heparin Induced Thrombocytopaemia. When HIT is suspected, heparin treatment should be discontinued and alternative anticoagulation should be started. The heparinoid danaparoid appears to be the drug of choice for acute treatment and prophylaxis because of its low placental permeability. Hirudin should only be used when either cross-reactivity with heparin-induced antibodies or cutaneous allergy against heparinoids are observed.



[Q: 892] OnExamination - Haematology

A 53-year-old woman presents with a six month history of recurrent facial and tongue swelling. She associated the attacks with consuming certain food additives and with contact with some cosmetics and cleaning

fluids. Her only regular medication was hormone replacement therapy.

Investigations reveal:

total serum IgE 145 kU/L (0-120)

serum C3 105 mg/dL (65-190)

serum C4 35 mg/dL (15-50)

What is the most likely diagnosis?

- 1- C1 esterase inhibitor deficiency
- 2- chemical intolerance
- 3- food allergy
- 4- idiopathic angioedema
- 5- mastocytosis

Answer & Comments

Answer: 3- food allergy

The history suggests atopy which is confirmed by the mildly elevated IgE concentration and normal C4 and C3 concentrations.

Hereditary or acquired angioedema is unlikely given the normal C4 and the history occurs late. Also the patient herself has noticed a link with food - food allergy is usually easier to diagnosis in adults. The cosmetics (chemical intolerance) are unlikely and the clinical history does not fit mastocytosis.



[Q: 893] OnExamination - Haematology

A 78-year-old female who is on warfarin for atrial fibrillation presents with melaena.

The blood pressure is 90/60 mmHg and the heart rate 100 bpm. Investigations show:

Haemoglobin 9g/l (12-16)

MCV 87 fl (83-95)

INR 7.2

A PR examination confirms melaena.

Which is the best option for correcting the coagulopathy?

- 1- FFP

- 2- IV Vitamin K

- 3- Stop warfarin and give IV Vitamin K

- 4- Stop warfarin and give IV Vitamin K and Prothrombin complex concentrate

- 5- Stop warfarin

Answer & Comments

Answer: 4- Stop warfarin and give IV Vitamin K and Prothrombin complex concentrate

This patient is hypotensive and tachycardic with melaena suggesting a major bleeding episode on warfarin. In these circumstances, current guidelines suggest stopping warfarin, giving IV vitamin K, and either FFP, or Prothrombin complex concentrate. Local guidelines will be available, and if in doubt consult with the haematologist on call. FFP may not completely reverse the effects of warfarin, so it may now be preferable to consider Prothrombin complex concentrate (PCC) if available.

The rate of fatal haemorrhage in patients receiving warfarin approaches 1%. It is therefore essential that knowledge regarding the reversal of warfarin coagulation is serviceable.



[Q: 894] OnExamination - Haematology

A 25-year-old female with a history of type 1 Von Willebrand's disease is referred for an opinion. She is to have a cervical cone biopsy and the admitting team are concerned about her clotting.

You find that she has a past history menorrhagia and has had two dental extractions as an adolescent that were uncomplicated.

What is the most useful test to assess her bleeding tendency?

- 1- Activated partial thromboplastin time
- 2- Bleeding time

- 3- Plasma factor VIII activity
- 4- Platelet aggregation
- 5- Prothrombin time

Answer & Comments

Answer: 3- Plasma factor VIII activity

In Type I vWD the PT and platelet aggregation will be normal. Bleeding time, APTT and FVIIIc are likely to be abnormal. The bleeding time would be a good screening test, but as we already know she has Type I vWBD it will not give a quantitative measurement of her bleeding tendency.

Similarly APTT will not be that useful. The most useful test in practice is to do the VWB Antigen and activity(RICOF); But you would also do FVIIIc as this is also low in vWD.



[Q: 895] OnExamination -
Haematology

Which of the following statements is true of sickle cell disease?

- 1- a painful shoulder joint will respond to intra-articular corticosteroid injection
- 2- oral iron supplements are required
- 3- symptoms of anaemia are usually limiting when Hb equals 8 g/dl
- 4- there is often an inability to concentrate urine
- 5- the spleen is frequently enlarged

Answer & Comments

Answer: 4- there is often an inability to concentrate urine

There is a tendency to iron overload in sickle cell disease and therefore iron therapy is not usually indicated.

The spleen is decreased in size after 6 months of age.

Blood transfusion is not indicated since anaemia is usually only symptomatic below 7g/dl - oxygen is released more readily from erythrocytes.

Intra-articular steroids should be avoided. Bone disease in sickle cell disease consists of aseptic necrosis, acute infarction and osteomyelitis so steroids will be harmful.



[Q: 896] OnExamination -
Haematology

A 75-year-old man has a history of Chronic Lymphocytic Leukaemia. He has had treatment with several courses of chemotherapy and has now been admitted to hospital with pneumonia. His past medical history revealed that he had suffered several previous upper respiratory tract infections over the previous six months.

Which of the following components of his immune system is likely to be deficient?

- 1- Complement
- 2- Immunoglobulin G
- 3- Macrophages
- 4- Mast cells
- 5- T lymphocytes

Answer & Comments

Answer: 2- Immunoglobulin G

CLL is commonly complicated by panhypogammaglobulinaemia. Although IV immunoglobulin prevents recurrent infections it does not prolong survival.



[Q: 897] OnExamination -
Haematology

A patient with end stage renal disease is receiving haemodialysis and erythropoietin.

Which of the following does Erythropoietin therapy cause?

- 1- Benign intracranial hypertension

- 2- Myositis
- 3- Hypotension
- 4- Seizures
- 5- Osteoporosis

Answer & Comments

Answer: 4- Seizures

Hypertension is a frequent problem associated with erythropoietin and may induce seizures. A particular symptom is the onset of sudden stabbing migraine-like headache and should raise awareness to the possibility of hypertensive crisis. Other adverse effects of treatment with erythropoietin include hyperkalaemia in uraemic patients, increased PCV (especially with misuse by normal individuals), thrombocythaemia, shunt thrombosis, induction of iron deficiency, skin rashes, urticaria and flu-like illness.



[Q: 898] OnExamination -
Haematology

Which of the following statements is most true regarding polycythaemia rubra vera (PRV)?

- 1- The diagnosis of PRV is based on a high red cell mass, normal oxygen saturations and splenomegaly
- 2- PRV may be characterised by a raised packed cell volume and decreased plasma volume
- 3- PRV is often associated with hypertension and smoking
- 4- PRV is usually associated with a high haemoglobin, but with neutropenia and thrombocytopenia
- 5- Venesection treatment will improve long term survival rates

Answer & Comments

Answer: 1- The diagnosis of PRV is based on a high red cell mass, normal oxygen saturations and splenomegaly

The diagnosis of PRV is based on exactly what is stated in stem A of this question - high red cell mass, normal oxygen saturations and splenomegaly. A decreased plasma volume causing a raised PCV is known as apparent or spurious polycythaemia. This may be associated with hypertension or smoking. PRV is usually associated with a raised haemoglobin, and often with a high platelet count and white cell count. Venesection will lessen the rates of thrombotic complications, but there is no evidence that venesection improves long term survival rates.



[Q: 899] OnExamination -
Haematology

Which if the following is the mechanism of action of warfarin?

- 1- Activation of gamma-glutamyl carboxylase
- 2- Chelation of calcium
- 3- Inhibition of activated factor X
- 4- Inhibition of vitamin K epoxide reductase
- 5- Inhibition of vitamin K-dependent carboxylase

Answer & Comments

Answer: 4- Inhibition of vitamin K epoxide reductase

The Vitamin K epoxide is in turn recycled back to Vitamin K and Vitamin K hydroquinone by another enzyme, the vitamin K epoxide reductase (VKOR). Warfarin inhibits epoxide reductase (specifically the VKORC1 subunit), thereby diminishing available vitamin K and Vitamin K hydroquinone in the tissues, which inhibits the carboxylation activity of the glutamyl carboxylase. When this occurs, the coagulation factors are no longer carboxylated at certain glutamic acid residues, and are incapable of binding to the endothelial surface of blood vessels, and are thus biologically inactive



[Q: 900] OnExamination -
Haematology

A 24-year-old female student presented with fever and rigors for two days, fatigue, headache especially retro-orbital and diarrhoea.

In particular she complained of a weakness of the left side of her face and drooping of the lip. She had recently returned from a sabbatical in Uganda four weeks previously. She was febrile (39.9C), had a mild left facial nerve palsy, lymphadenopathy in her axillae and groin and she had an erythematous, maculopapular rash. Laboratory investigations showed.

Hb 12.0 g/dL (11.5-16.5)

WBC $3.0 \times 10^9/L$ (4-11)

Platelets $150 \times 10^9/L$ (150-400)

Blood film Lymphopaenia, some atypical lymphocytes seen

Which of the following is the most likely diagnosis?

- 1- Acute HIV infection (seroconversion illness)
- 2- Dengue fever
- 3- Infectious mononucleosis
- 4- Typhoid fever
- 5- Viral hepatitis

Answer & Comments

Answer: 1- Acute HIV infection (seroconversion illness)

Acute HIV seroconversion illness should be suspected where there has been a risk of exposure.

The symptoms and signs are often vague but the clinical presentation here is consistent. The median time from exposure to presentation is 25 days.

More than three quarters of patients who become infected with HIV develop symptoms consistent with primary HIV infection.

Symptoms typically appear a few days to a few weeks after exposure to HIV, and generally include several of the following:

- * Fever
- * Rash, often erythematous maculopapular
- * Fatigue
- * Pharyngitis
- * Generalized lymphadenopathy
- * Urticaria
- * Myalgia/arthralgia
- * Anorexia
- * Mucocutaneous ulceration
- * Headache, retroorbital pain
- * Neurologic symptoms (eg, aseptic meningitis, radiculitis, myelitis)



[Q: 901] OnExamination -
Haematology

An 80-year-old woman has a three month history of progressive numbness and unsteadiness of her gait. On examination, there is a mild spastic paraparesis, with brisk knee reflexes, ankle reflexes are present with reinforcement, extensor plantars, sensory loss in the legs with a sensory level at T10, impaired joint position sense in the toes, and loss of vibration sense below the iliac crests.

Investigations were as follows:-

haemoglobin 12.2 g/dl (12-16)

MCV 95 fl (85-95)

What is the most likely diagnosis?

- 1- anterior spinal artery occlusion
- 2- dorsal meningioma
- 3- multiple sclerosis
- 4- subacute combined degeneration of the cord
- 5- tabes dorsalis

Answer & Comments

Answer: 2- dorsal meningioma

The presence of a sensory loss at T10 indicates a thoracic myelopathy. Subacute combined degeneration of the cord is unlikely as Hb and MCV are normal. Anterior spinal artery occlusion is unlikely as the history is progressive.



[Q: 902] OnExamination -
Haematology

A 56-year-old female presents at the general practitioner with weakness. A full blood count reveals a haemoglobin concentration of 10.5 g/dl and an mean cell volume of 104 fl, but no other abnormality.

Which of the following may account for this?

- 1- Hormone replacement therapy
- 2- Thyrotoxicosis
- 3- Ulcerative colitis
- 4- Zollinger-Ellison syndrome
- 5- Scurvy

Answer & Comments

Answer: 5- Scurvy

Bear in mind this patient's symptoms and her FBC. She has weakness and in association with a mild anaemia (don't really think that this would cause the weakness) and her increased MCV a vitamin C deficiency is most probable. Vitamin C deficiency is associated with a macrocytosis and slight anaemia. HRT is more likely to be associated with Fe deficiency anaemia as is Zollinger-Ellison syndrome and ulcerative colitis. Hypothyroidism is associated with macrocytosis.



[Q: 903] OnExamination -
Haematology

A 75-year-old male is admitted with tiredness and lethargy and is found to have an enlarged

right supraclavicular mass.

Past medical history reveals that he had been developed acrocyanosis, six months previously and two months ago had been admitted with a chest infection for which he was treated with Co-Amoxiclav.

Investigations reveal:

blood film red cell auto-agglutination

direct antiglobulin test positive

cold agglutinin test positive

What is the most likely diagnosis?

- 1- Bronchial carcinoma
- 2- Drug-induced haemolysis
- 3- Mycoplasma pneumoniae infection
- 4- non-Hodgkin's lymphoma
- 5- Paroxysmal cold haemoglobinuria

Answer & Comments

Answer: 4- non-Hodgkin's lymphoma

Results are consistent with an Autoimmune Haemolytic screen caused by a Cold antibody. Drug induced haemolysis does not give these results. Bronchial Ca can give rise to an autoimmune haemolytic process but the antibody is usually warm- you do not get red cell agglutination or a positive cold agglutinin test.

PCH is a rare syndrome of acute intravascular haemolysis after exposure to cold caused by the Donath Landsteiner Antibody. Typically follows a viral illness or syphilis and usually self limiting.

The results and clinical description of acrocyanosis are consistent with a cold auto antibody.(Cold Autoimmune Haemolytic Anaemia)

The Antibody attaches to the RBC's in the peripheral circulation where the blood is cold, causing agglutination of the RBC's in the small vessels leading to the acrocyanosis. It is an

IgM Ab that can fix complement and cause both intra- and extravascular haemolysis. It can be a primary phenomenon (Idiopathic cold haemagglutinin disease) or secondary to infection eg. *Mycoplasma pneumoniae* or EBV or secondary to lymphoma.

The acrocyanosis developed before the chest infection, and in view of the lymphadenopathy, then NHL is the likely cause.



[Q: 904] OnExamination -
Haematology

Whilst being investigated for infertility, a 30-year-old woman is noted to have some bruising on her limbs with a palpable spleen on abdominal examination.

Investigations reveal:

Haemoglobin 10.0 g/dL (11.5 - 16.5)

White cell count $110 \times 10^9/L$ (4 - 11)

Neutrophils $60 \times 10^9/L$ (1.5 - 7)

Lymphocytes $2 \times 10^9/L$ (1.5 - 4)

Monocytes $0.8 \times 10^9/L$ (0 - 0.8)

Eosinophils $0.3 \times 10^9/L$ (0.04 - 0.4)

Basophils $0.7 \times 10^9/L$ (0 - 0.1)

Myelocytes $40 \times 10^9/L$

Myeloblasts $4 \times 10^9/L$

Platelet count $900 \times 10^9/L$ (150 - 400)

What is the most likely diagnosis?

- 1- Acute myeloid leukaemia
- 2- Acute promyelocytic leukaemia
- 3- Chronic myeloid leukaemia
- 4- Essential thrombocythaemia
- 5- Myelofibrosis

Answer & Comments

Answer: 3- Chronic myeloid leukaemia

The features of this blood film are anaemia, thrombocytosis, neutrophilia with roughly

55% neutrophils, 40% myelocytes with less than 5% blast cells. This is typical of Chronic Myeloid Leukaemia which usually has associated tender splenomegaly. Usually the Philadelphia chromosome is present in 95% of cases. Acute leukaemia is defined as blast cells constituting over 30% of cell type present. Chronic myeloid leukaemia often ends in acute blastic transformation after a mean duration of approx 4 years.



[Q: 905] OnExamination -
Haematology

Which of the following conditions is most likely to be associated with thrombocytopenia?

- 1- haemophilia A
- 2- hereditary haemorrhagic telangiectasia
- 3- pernicious anaemia
- 4- porphyria
- 5- uraemia

Answer & Comments

Answer: 3- pernicious anaemia

Pernicious anaemia is usually a megaloblastic anaemia but may also be associated with a pancytopenia.

The platelet count is usually normal in chronic renal failure but there is a platelet function abnormality.



[Q: 906] OnExamination -
Haematology

A 40-year-old man presents with bleeding gums and ease of bruising. His only medication is omeprazole for dyspepsia.

Investigations show:

Haemoglobin 12.5 g/dL (13.0-16.5)

MCV 90 fL (83-95)

Platelets $20 \times 10^9/L$ (150-400)

Blood film: occasional giant platelets

Prothrombin time 13.5s (11.5-15.5)

What is the most likely diagnosis?

- 1- Amegakaryocytic thrombocytopenia
- 2- Disseminated intravascular coagulation
- 3- Drug-induced thrombocytopenia
- 4- Immune thrombocytopenia
- 5- Thrombotic thrombocytopenic purpura

Answer & Comments

Answer: 4- Immune thrombocytopenia

Only abnormality is the very low platelet count. The Bone marrow is still working as there are giant platelets seen on film, which you see when there is peripheral consumption of the platelets(rules out A).

The large platelets are a sign that the bone marrow is churning them out prematurely to keep up with demand.

With disseminated intravascular coagulation the prothrombin time would be prolonged.

With thrombotic thrombocytopenic purpura the haemoglobin would be low- as haemolysis is a feature.

Drug-induced thrombocytopenia in itself is an immune mechanism, and while Lansoprazole can cause a reduction in platelet count, it is not classically a drug you associate with drug induced thrombocytopenia.

Immune thrombocytopenia, is very common, and would give this very low platelet count, and by choosing this answer it covers drug induced thrombocytopenia as well.



[Q: 907] OnExamination - Haematology

An eighty-year-old man presents with tiredness and weakness. A diagnosis of myelodysplastic syndrome is suspected.

Which of the following statements regarding myelodysplastic syndrome is correct?

- 1- Absence of ring sideroblasts on the blood film excludes myelodysplasia as a diagnosis
- 2- Cytotoxic chemotherapy is likely to be part of his treatment
- 3- He is more likely to die from an infection than from leukaemic transformation
- 4- If blast cells constitute 1% of the total white cells, this signifies leukaemic transformation.
- 5- On a blood film, neutrophils typically show toxic granulation

Answer & Comments

Answer: 3- He is more likely to die from an infection than from leukaemic transformation

The patient has myelodysplastic syndrome (MDS). Myelodysplastic syndrome is a disease of old age. Men are affected more frequently than women. 80% of patients present because of symptoms of anaemia. The blood film typically shows pancytopenia with hypogranular neutrophils. The number of blasts seen varies.

The disease can be classified into five subtypes:

- " 1. Refractory anaemia (<5% blasts)
- " 2. Refractory anaemia with ring sideroblasts (<5% blasts; >15% sideroblasts)
- " 3. Refractory anaemia with excess blasts (5-19% blasts)
- " 4. Refractory ansema with excess blasts in transformation (blasts 20-29% - near AML)
- " 5. CML (> 1 x 10⁹/L monocytes)

Few patients require aggressive therapy and most need only supportive care. As the vast majority are elderly patients with other medical conditions, excessive intervention is unwarranted. Transfusions of packed red cells or platelets may be required and antibiotics for intercurrent infections. G-CSF and r-Epo

can improve blood counts. Aggressive cytotoxic chemotherapy is generally reserved for treatment of transformation to AML in younger patients.

Median survival is two years. Patients are more likely to have serious infections or life-threatening bleeds than blastic transformation.



[Q: 908] OnExamination -
Haematology

Which of the following is a proto-oncogene?

- 1- The N-Myc gene
- 2- The WT1 (first Wilm's tumour) gene
- 3- The Retinoblastoma gene
- 4- The WT2 (second Wilm's tumour) gene
- 5- The BCRab1 translocation (Philadelphia chromosome)

Answer & Comments

Answer: 1- The N-Myc gene

Oncogenes are endogenous human DNA sequences that arise from normal genes called proto-oncogenes. Proto-oncogenes are normally expressed in many cells, particularly during fetal development, and are thought to play an important regulatory role in cell growth and development. Alterations in the proto-oncogene can activate an oncogene, which produces unregulated gene activity, contributing directly to tumourigenesis. Oncogene alterations are important causes of:

- " Rhabdomyosarcomas (ras oncogene).
- " Burkitt's lymphoma (C-myc is translocated intact from its normal position on chromosome 8 to chromosome 14).
- " Neuroblastoma (N-myc proto-oncogene is seen in a proportion of patients with poor prognosis).

They should be contrasted with tumour suppressor genes. In this situation, the genes

normally down regulate cell growth, and require inactivation to allow malignant growth. Examples include retinoblastoma.



[Q: 909] OnExamination -
Haematology

Which of the following haematological disorders is inherited as an autosomal recessive condition?

- 1- Antithrombin III deficiency
- 2- Protein C deficiency
- 3- Glucose-6-phosphate dehydrogenase deficiency
- 4- Pyruvate kinase deficiency
- 5- Acute intermittent porphyria

Answer & Comments

Answer: 4- Pyruvate kinase deficiency

Anti-thrombin 3 (AT3) is a plasma inhibitor protein that blocks the enzymatic activity of some serine proteases coagulation factors. The activity of this inhibitor is increased by heparin. AT3 is synthesised by the liver, is not Vitamin K dependent, and can be consumed during DIC. Normal newborns have a reduced activity. Congenital AT3 deficiency is an autosomal dominant. Treatment of thrombotic in these events in these patients may be difficult.

Protein C is an inhibitor that once activated inhibits clot formation and enhances fibrinolysis. It is liver synthesised and Vitamin K dependent. Protein C is converted to an active enzyme by a thrombin-thrombomodulin complex on the endothelial cell surface. Activated protein C inhibits a plasminogen activator inhibitor, which results in enhanced fibrinolysis, and, with protein S as a co-factor, inhibits the clotting of the activated factors 5 and 8 by limited proteolysis. Activated protein C thus controls the conversion of factor 10 to 10a and prothrombin to thrombin. Congenital

deficiency is an autosomal dominant trait. Acquired deficiency may occur in association with infection.

Glucose-6-phosphate dehydrogenase deficiency is the most important disease of the pentose phosphate pathway, and is responsible 2 clinical syndromes: an episodic haemolytic anaemia induced by infections or certain drugs, and a spontaneous chronic non-spherocytic haemolytic anaemia. The deficiency is X-linked, and heterozygous females are resistant to falciparum infections. There are a large number of abnormal alleles causing disease of vastly different severity.

Pyruvate kinase deficiency is a rare congenital haemolytic anaemia inherited as an autosomal recessive. Generation of ATP within the red cell is impaired resulting in an abnormally high concentration of 2,3,DPG in the red cell, which inhibits the enzymes of the pentose phosphate pathway. Clinical manifestations vary from severe neonatal haemolysis, to a mild well compensated haemolysis first noted in adulthood.

Acute intermittent porphyria is an autosomal dominant disorder resulting from partial porphobilinogen deaminase deficiency in the cytosol of all tissues including erythrocytes. Clinical expression of the disease is linked to environmental or acquired factors such as nutritional status, drugs, steroid or chemicals. The major abnormality is of the peripheral, autonomic or CNS. Major symptoms are abdominal pain, nausea, vomiting, constipation or diarrhoea. In severe cases the urine develops a port wine colour due to the high content of porphobilin, an auto-oxidation product of PBG. Hypertension and neuropathy are common, with muscle weakness, cranial nerve abnormality and seizures.



[Q: 910] OnExamination - Haematology

A patient presents with acute promyelocytic leukaemia.

What is the likely mechanism underlying leukaemogenesis?

- 1- aberrant fusion of 2 genes
- 2- impaired protein degradation
- 3- over expression of cellular oncogene
- 4- post-translational modification
- 5- telomere shortening

Answer & Comments

Answer: 1- aberrant fusion of 2 genes

In APL, one of the Retinoic Acid Receptor genes, RARA, is fused to PML in the great majority of patients as a result of the chromosomal translocation t(15; 17).



[Q: 911] OnExamination - Haematology

A patient who received total body irradiation for the treatment of Hodgkin's Lymphoma develops Graft Versus Host Disease (GVHD).

Which of the following blood products is likely to have caused this?

- 1- Cryoprecipitate
- 2- FFP
- 3- Frozen deglycerolized red blood cells
- 4- Immunoglobulin
- 5- Packed red blood cells

Answer & Comments

Answer: 5- Packed red blood cells

Graft versus host disease (GVHD) occurs when donor lymphocytes engraft in a susceptible recipient. Products implicated in cases of TA-GVHD include non-irradiated whole blood, packed red blood cells, platelets, granulocytes and fresh non-frozen plasma. Frozen deglycerolized red blood cells, fresh frozen plasma and cryoprecipitate have not been implicated.



[Q: 912] OnExamination -
Haematology

A 17-year-old girl with mild Von Willebrand's disease is scheduled for dental extraction. A previous dental extraction resulted in bleeding that had required two unit transfusion.

What is the most appropriate treatment prior to dental surgery?

- 1- Cryoprecipitate
- 2- DDAVP
- 3- Fresh frozen plasma
- 4- High purity factor VIII concentrate
- 5- Recombinant factor VIII concentrate

Answer & Comments

Answer: 2- DDAVP

DDAVP is the choice treatment for mild vonWillebrand disease, which would include Type I, and the majority of Type II, although there is some controversy in Type II B as it is thought that DDAVP can exacerbate thrombocytopenia that can accompany this type of Von Willebrand's.

It is of no use in Type III - severe Von Villebrand's disease. The history tells us that she has mild disease.

You would not use cryoprecipitate or Fresh frozen plasma in these patients in this era due to potential viral transmission risk from blood products. For severe disease you would use a Von Willebrand factor concentrate, not factor VIII concentrate.



[Q: 913] OnExamination -
Haematology

A 70-year-old male is diagnosed with multiple myeloma and is treated with melphalan and prednisolone.

Which of the following when added to this chemotherapeutic regime would be expected to improve survival?

- 1- Cyclosporin
- 2- Interferon alpha
- 3- Methotrexate
- 4- Thalidomide
- 5- Simvastatin

Answer & Comments

Answer: 4- Thalidomide

Significant improvements in survival may be expected through the addition of Thalidomide to standard chemotherapeutic regimes. Studies suggest a significant improvement at both 2 years and 5 years with Thalidomide.



[Q: 914] OnExamination -
Haematology

A 71-year-old man presents with a tender left calf and has a background history of headaches, tiredness and dizziness. He is a smoker of 20 cigarettes daily and drinks 45 units of alcohol weekly. On examination he was plethoric, had a blood pressure of 186/102 mmHg and has a swollen, hot tender and erythematous left calf. Dopplers confirm the presence of a deep vein thrombosis.

Investigations reveal:

haemoglobin 19 g/dL (13-18)

haematocrit 0.58 (0.4-0.52)

white cell count $12.5 \times 10^9/L$ (4-11)

platelet count $500 \times 10^9/L$ (150-400)

Which one of the following is the most appropriate investigation to establish the diagnosis?

- 1- Abdominal ultrasound scan
- 2- Arterial blood gases
- 3- Red blood cell mass
- 4- Bone marrow trephine
- 5- Leucocyte alkaline phosphatase score

Answer & Comments

Answer: 3- Red blood cell mass

The most significant abnormality is the raised Haemoglobin and Haematocrit suggesting polycythaemia which in the presence of all the other features suggest secondary polycythaemia. Therefore, the most useful INITIAL investigation will be red cell mass studies which would distinguish between true and relative polycythaemia- further investigations will then be dictated by the results of this initial test- an USS, bone marrow etc and blood gases may be needed after the initial red cell mass studies. The leucocyte alkaline phosphatase score is rather outdated and seldom performed.

The raised WCC and platelet count would suggest that this is primary polycythaemia not apparent polycythaemia but red blood cell mass is still the best answer.



[Q: 915] OnExamination - Haematology

A 62-year-old male is diagnosed with Chronic myeloid leukaemia and his investigations show that both Philadelphia chromosome and bcr/abl gene is present.

What is the significance of the presence of the bcr/abl gene?

- 1- Acts on stem cell line DNA
- 2- Blocks apoptosis
- 3- Codes for the production of a tyrosine kinase in the leukaemic cells
- 4- Increases production of granulocyte colony stimulating factor
- 5- Increases expression of granulocyte colony stimulating factor receptors on the cell membrane.

Answer & Comments

Answer: 3- Codes for the production of a tyrosine kinase in the leukaemic cells

The product of the bcr/abl gene that is seen 97% cases of Chronic Myeloid Leukaemia, is a constitutively active Tyrosine Kinase, this is responsible for the leukaemic process.



[Q: 916] OnExamination - Haematology

A 22-year-old male presents with episodic nausea and abdominal pain although has maintained a normal weight. The symptoms have been attributed to irritable bowel syndrome. There are no abnormalities on examination. Blood tests were performed which reveal:

Haemoglobin 12.2 g/dl (11.5-16)

MCV 92fl (83-95)

White cell count $6.5 \times 10^9/L$ (4-10)

Platelets $310 \times 10^9/L$ (150-400)

Reticulocytes 5%

Bilirubin 42 micromol/l (0-18)

AST/ALP Normal

Coomb's test negative

Haptoglobin undetectable

Which of the following is the likely diagnosis?

- 1- Acute intermittent porphyria
- 2- Dubin-Johnson syndrome
- 3- Gilbert's syndrome
- 4- Hereditary spherocytosis
- 5- Viral hepatitis

Answer & Comments

Answer: 4- Hereditary spherocytosis

This patient has an elevated bilirubin concentration and elevated reticulocyte count suggesting haemolysis. The most likely explanation would be hereditary spherocytosis which could be confirmed on blood film. This too explains the symptoms - nausea and abdominal pains suggesting gallstones, which is common even in mild disease.



[Q: 917] OnExamination -
Haematology

Which of the following statements regarding lymphomas in childhood is correct?

- 1- Hodgkin's disease is more common than non-Hodgkin's under the age of 5 years.
- 2- Hodgkin's disease has equal sex incidence.
- 3- lymphocyte-predominant Hodgkin's disease has the worse prognosis.
- 4- the nodular sclerosing variety is the most common form of Hodgkin's disease.
- 5- the most common presenting clinical sign is splenomegaly.

Answer & Comments

Answer: 4- the nodular sclerosing variety is the most common form of Hodgkin's disease.

Hodgkin's lymphoma occurs in four forms: (1) lymphocyte-predominant (10-20%) with the best prognosis; (2) nodular sclerosing (50%) which is the most common form; (3) mixed cellularity (40-50%) which is most likely to have extranodal disease at presentation; and (4) lymphocyte depleted (<10%) which is the rarest type with the worst prognosis. Hodgkin's disease is rarely found in children aged less than 5 years old (male:female ratio=2:1) and peaks at between 15 and 34 years. Non-Hodgkin's disease is more common in younger children (male:female ratio=3:1). The most common presenting clinical sign is enlarged cervical lymph nodes. From Hannam et al. MRCP (Paediatrics) Part 1 MCQs. page 15 ?WB Saunders. Reproduced with permission.



[Q: 918] OnExamination -
Haematology

A patient with AML develops jaundice and spiking pyrexia 3 weeks into induction chemotherapy. The patient remained pyrexial after 7 days of intravenous antibiotics.

What is the likely diagnosis?

- 1- CMV
- 2- Fungal infection
- 3- Hepatic leukaemic deposits
- 4- Miliary TB
- 5- Toxoplasmosis

Answer & Comments

Answer: 1- CMV

The most likely cause for the persisting pyrexia plus hepatitis in this immunocompromised patient treated with appropriate antibiotics would be a CMV infection. Fungal infection would not be expected to cause the jaundice but again may be responsible for the pyrexia. TB would be most unlikely and hepatic infiltration would not be expected to produce this pyrexia.



[Q: 919] OnExamination -
Haematology

Which of the following statements regarding thrombocytosis is correct?

- 1- The commonest cause is Essential Thrombocythaemia
- 2- Occurs exclusively in essential thrombocythaemia
- 3- Erythropoietin is the key hormone in the regulation of megakaryocyte differentiation
- 4- May occur as a response to exercise
- 5- Secondary thrombocytosis is an indication for hydroxycarbamide therapy

Answer & Comments

Answer: 4- May occur as a response to exercise

The commonest cause of thrombocytosis is a reactive thrombocytosis. Thrombocythaemia may occur in any of the myeloproliferative disorders, particularly PRV. Thrombopoietin is the key hormone in the regulation of

megakaryocyte differentiation. Secondary thrombocytosis does not place the patient at risk for haemostatic nor cardiovascular events.



[Q: 920] OnExamination -
Haematology

Which of the following statements concerning abnormalities of the haemoglobin molecule is true?

- 1- Alpha thalassaemia is due to a deficiency of beta-chain production
- 2- HbS is caused by a single base mutation on the beta-chain
- 3- genes for the alpha and beta chains are located on the same chromosome
- 4- in thalassaemia persistence of HbF is an adverse prognostic sign
- 5- oligonucleotide probes may assist in the diagnosis of haemoglobinopathies in adolescents

Answer & Comments

Answer: 2- HbS is caused by a single base mutation on the beta-chain

Alpha Thalassaemia is due to abnormalities of the alpha chain. Persistence of HbF has survival advantages in severely affected subjects. C-alpha 16, beta 11. e-Hb electrophoresis in the adult rather than oligonucleotide probes as used in the fetus (Dr Shu Ho)



[Q: 921] OnExamination -
Haematology

Heinz bodies in red blood cells in haemolytic anaemia is present in

- 1- paroxysmal nocturnal haemoglobinuria
- 2- Glucose 6 phosphate dehydrogenase deficiency
- 3- post splenectomy
- 4- cold agglutinin disease

- 5- clostridium welchii septicaemia

Answer & Comments

Answer: 2- Glucose 6 phosphate dehydrogenase deficiency

Heinz bodies = oxidised denatured Hb. Post splenectomy causes target cells, Pappenheimer bodies (siderotic granules) and Howell-Jolly bodies (DNA remnants).



[Q: 922] OnExamination -
Haematology

A 45-year-old Chinese man is found incidentally to have a severely hypochromic and microcytic blood picture, with Hb 11.2g/dl. He is asymptomatic.

Which of the following is the most discriminatory investigation?

- 1- Barium enema
- 2- Gastroscopy
- 3- Haemoglobin electrophoresis
- 4- Bone marrow biopsy
- 5- Ham test

Answer & Comments

Answer: 3- Haemoglobin electrophoresis

Thalassaemia trait is a common, usually asymptomatic abnormality. Red cells are hypochromic and microcytic, but iron and ferritin stores are normal. Haemoglobin electrophoresis shows raised HbA₂ (>3.5%) and raised HbF (normally consist predominantly of HbA with trace of HbF and HbA₂).



[Q: 923] OnExamination -
Haematology

A 42-year-old man presented with tiredness, breathlessness, and nose bleeds for three weeks. On examination there were several bruises on his arms and legs, 2 cm

splenomegaly and fundal haemorrhages.
Investigations revealed:

haemoglobin 7.2 g/dL (11.5-16.5)

white cell count $13.8 \times 10^9/L$ (4-11)

platelet count $24 \times 10^9/L$ (150-400)

blood film white cells predominantly myeloblasts and promyelocytes

Which one of the following investigations would be of most prognostic value?

- 1- cerebrospinal fluid examination
- 2- cytochemistry
- 3- cytogenic karyotype
- 4- immunophenotyping
- 5- bone marrow trephine biopsy

Answer & Comments

Answer: 3- cytogenic karyotype

Cytogenetic evaluation of malignant haematological cells may have important implications for the prognosis and treatment options in AML. For example t(8;21) confers a good prognosis in adult AML, and about 70% of patients in this low-risk group can be cured with intensive chemotherapy alone, radiotherapy being reserved for patients who relapse.



[Q: 924] OnExamination -
Haematology

A 30-year-old male presents with episodic jaundice and anaemia and has been diagnosed with glucose-6-phosphate dehydrogenase (G6PD) deficiency.

On further testing, his wife has normal plasma G6PD activity.

What is the risk of their children developing this condition?.

Which one of the following statements is correct?

- 1- 50% of their children will be affected, irrespective of gender
- 2- All their sons will be affected
- 3- All their children will be affected
- 4- All their daughters will be affected
- 5- None of their children will be affected

Answer & Comments

Answer: 5- None of their children will be affected

G6PD is X linked- therefore females are carriers, and are not usually affected, unless there is inactivation of their X chromosome, Males are affected.

Males will pass on the 'bad' X chromosome to their daughters so that they become carriers, and are said above they are not usually affected. Males pass on their Y chromosomes to any sons, therefore they will not be affected.

In the question the male is affected, but as the female has normal levels of the enzyme, we are assuming she is not a carrier (although strictly she could be a carrier and have normal levels).

The male will pass on the X chromosome to any daughters, who will not be affected, as they will have a 'good' X from the mothers, and the father will pass on the Y chromosome to his sons, which will not be affected.



[Q: 925] OnExamination -
Haematology

Folic acid metabolism can be affected by

- 1- tetracycline
- 2- pyrimethamine
- 3- Vitamin B₁₂
- 4- penicillin
- 5- brufen

Answer & Comments

Answer: 2- pyrimethamine

Drugs which inhibit dihydrofolate reductase = methotrexate, pyrimethamine and trimethoprim. Drugs which interfere with absorption/storage of folate = phenytoin, primidone, oral contraceptives.



[Q: 926] OnExamination - Haematology

A 50-year-old female presents with acute chest pain and dyspnoea.

Examination reveals bilateral ankle oedema with 24 hr urine protein assessment showing 8g/d (<0.2).

Which is the most likely explanation for these findings?

- 1- factor V Leiden
- 2- reduced antithrombin III activity
- 3- reduced concentration of Von Willebrand's factor
- 4- reduced fibrinogen concentration
- 5- reduced factor VIII

Answer & Comments

Answer: 2- reduced antithrombin III activity

This patient has developed nephrotic syndrome. and appears to have had a thromboembolic event. The suggestion is that she has had nephritic syndrome before developing the thromboembolism. Deranged coagulation associated with Nephrotic syndrome is a consequence of AT III deficiency, increased fibrinogen and increased Factor VIIIc.



[Q: 927] OnExamination - Haematology

A 61-year-old, who has smoked for 40 years, presents with thoracic back pain.

His investigations reveal:

Haemoglobin 11.1 g/dl

Urea 9.3 mmol/l

Creatinine 298 micromol/l

Calcium 3.67 mmol/l

Albumin 30 g/l

Total protein 97 g/l

Thoracic spine X-ray collapse of T8

Which investigation would confirm the diagnosis?

- 1- Bone Marrow Aspirate
- 2- CXR
- 3- Creatinine Clearance
- 4- ESR
- 5- PTH

Answer & Comments

Answer: 1- Bone Marrow Aspirate

This man has myeloma. The smoking is a red herring. Myeloma typically presents with back pain often associated with pathological fractures. He is mildly anaemic, there is renal impairment and hypercalcaemia, with a raised total protein secondary to a paraproteinaemia. Bone marrow examination would reveal increased plasma cells (>4% and usually >30%). The ESR will be raised, but the bone marrow aspirate would confirm the diagnosis irrefutably.



[Q: 928] OnExamination - Haematology

A 21-year-old man with non-Hodgkin's lymphoma and haemolytic anaemia is assessed for splenectomy.

When should Pneumovax vaccine be administered?

- 1- one month before surgery
- 2- one week before surgery
- 3- one week after surgery

- 4- one month after surgery
5- perioperatively

Answer & Comments

Answer: 1- one month before surgery

The vaccine should be given a minimum of two weeks before elective splenectomy in order to ensure an optimal antibody response. In emergency splenectomy the patient should be immunized as soon as possible after recovery from the operation and before discharge from hospital. Unvaccinated patients splenectomized some time earlier should be vaccinated at the first opportunity. Vaccination is delayed for at least six months after immunosuppressive chemotherapy or radiotherapy, during which time prophylactic antibiotics should be given.



[Q: 929] OnExamination -
Haematology

A 32-year-old man was prescribed an oral antibiotic for a urinary tract infection. Two days later he noticed that his urine was increasingly dark in colour. Investigations revealed:

haemoglobin 8.5g/dL (13.0-18.0)

reticulocytes $147 \times 10^9/L$ (25-85)

Blood film: marked anisopoikilocytosis and bite cells

What is the most likely diagnosis?

- 1- Acute Myeloid Leukaemia
- 2- Autoimmune haemolytic anaemia
- 3- haemoglobin H disease
- 4- hereditary spherocytosis
- 5- paroxysmal cold haemoglobinuria

Answer & Comments

Answer: 2- Autoimmune haemolytic anaemia

I think that this is a difficult question!

Paroxysmal cold hemoglobinuria (PCH) is a rare type of autoimmune hemolytic anemia (AIHA), occurring primarily in children. The classic symptom of PCH is a sudden onset of hemoglobinuria following exposure to cold, even for a few minutes. Symptoms may occur minutes to hours following exposure to cold. Hemoglobinuria is not always present because, in some persons with PCH, the autoantibody level is not high enough to cause intravascular hemolysis. PCH is usually of abrupt onset in the setting of an infectious disease. Given the patient's age, and the specific history in this case, the diagnosis is unlikely to be PCH. If the diagnosis was hereditary spherocytosis, then the blood film would show spherocytes. In Haemoglobin H disease, the typical inclusions can be demonstrated in erythrocytes stained with brilliant cresyl blue, and a chronic microcytic, hypochromic anaemia would be present. Haemolytic anaemia may be precipitated by sulfonamides, and also by penicillins. This gentleman may have been treated with trimethoprim or a penicillin, which then caused AIHA, with the typical blood film. I feel that the most appropriate answer to this question is B, given the patient's age, the lack of history of exposure to cold, and the history which is given of antibiotic prescription.



[Q: 930] OnExamination -
Haematology

Which of the following public health measures would reduce the incidence of iron deficiency anaemia?

- 1- Using doorstep cow's milk from 6 months of age.
- 2- Giving young children tea rather than fruit juice.
- 3- Delaying the introduction of mixed feeding until 9 months of age.
- 4- Giving 0.5mg per day of elemental iron to all preterm babies.

5- Continuing breast feeding until a year of age.

Answer & Comments

Answer: 5- Continuing breast feeding until a year of age.

Answer: 5) Continuing breast feeding until a year of age

The following would achieve primary prevention of iron deficiency anaemia:

" Provision of adequate iron supplements for premature and low birth weight infants in adequate dosage (2mg/kg of elemental iron per day).

" Not using unmodified doorstep milk in the first year of life. Although breast milk has a low iron concentration, the relative bioavailability is much higher than from modified or unmodified cow's milk.

" Not giving young children tea (this reduced iron's bioavailability).

" Use of follow-on or ordinary infant formulae in the second half of the first year of life.

" Weaning on to mixed feeding by 6 months of age.

" Iron supplementation for all children in high risk groups.



[Q: 931] OnExamination -
Haematology

A 70-year-old female presents with a three month history of exertional dyspnoea and chest pain. She admitted to a poor diet, some vague abdominal pains and having lost 7kg in weight.

Examination revealed pallor, patches of vitiligo on her arms and trunk, ankle oedema and a palpable spleen.

Investigations revealed:

Haemoglobin 5 g/dl (11.5-16.5)

MCV 105 fL (80-96)

White cell count $2 \times 10^9/L$ (4-11)

Platelet count $50 \times 10^9/L$ (150-400)

Bilirubin 40 $\mu\text{mol/L}$ (1-22)

ALT 60 U/L (5-35)

AST 40 U/L (1-31)

LDH 1000 U/L (10-250)

Which one of the following is the most likely diagnosis?

1- Aplastic anaemia

2- Autoimmune haemolytic anaemia

3- Dietary folate deficiency

4- Pernicious anaemia

5- Sideroblastic anaemia

Answer & Comments

Answer: 4- Pernicious anaemia

There is pancytopenia, with anaemia being more significant. The anaemia is macrocytic. LDH is very high with some derangement of LFT's. Aplastic anaemia would cause pancytopenia but not a raised LDH.

Autoimmune haemolysis and Sideroblastic anaemia would not cause pancytopenia.

Folate deficiency and Pernicious Anaemia would both cause the above results- the LDH is elevated due to ineffective erythropoiesis and likewise the deranged LFT's.

Pernicious Anaemia is more likely given the history of other autoimmune disease.

Of note, with such a low Haemoglobin one would expect a much higher MCV; but sometimes when the deficiency is severe, the red cell anisopoikilocytosis causes a lower MCV.



[Q: 932] OnExamination -
Haematology

A 23-year-old footballer was prescribed Ibuprofen by his GP for a sprained ankle. Several hours later he felt very unwell and was passing dark urine. The peripheral blood film shows many schistocytes. The lab results show:

Haemoglobin <9 g/L

WBC 7×10^9 /L with normal differentials

Platelets 450×10^9 /L

Reticulocyte count 5%

Bilirubin 40 μ mol/L

What is the most likely cause for her presentation?

- 1- Allergic reaction
- 2- Autoimmune haemolytic anaemia
- 3- Glucose-6-phosphate dehydrogenase deficiency
- 4- Paroxysmal nocturnal haemoglobinuria
- 5- Pyruvate kinase deficiency

Answer & Comments

Answer: 3- Glucose-6-phosphate dehydrogenase deficiency

This is a case of intravascular haemolysis with haemoglobinuria. The patient has the history of taking Ibuprofen which is an oxidant and causes hemolysis in patients with G-6-PD deficiency. Oxidative stressors can be infectious agents, drugs, chemicals and certain legumes. In G-6-PD deficient patients, oxidative stress exposes interior sulphhydryl groups that are oxidized and cannot be reduced, leading to irreversible denaturation of the hemoglobin with Heinz body formation. Schistocytes are red blood cell fragments that result from membrane damage. They are sometimes referred to as "bite cells".



[Q: 933] OnExamination -
Haematology

Which of the following statements regarding Disseminated intravascular coagulation is most correct?

- 1- Removal of the underlying cause of the DIC will lead to resolution the manifestations of DIC
- 2- DIC is associated with a rising platelet count
- 3- DIC is associated with rising fibrinogen levels
- 4- Normal clotting parameters effectively excludes a diagnosis of DIC
- 5- DIC is associated with an elevated D-Dimer

Answer & Comments

Answer: 5- DIC is associated with an elevated D-Dimer

DIC is caused by the enhanced and abnormally sustained generation of thrombin, and is associated with elevated products of fibrin breakdown, one of these being D-Dimer. Treatment of the underlying cause eg sepsis, does not always lead to resolution of the condition, and recombinant human activated protein C has been shown to be effective in reducing mortality from DIC in patients with sepsis. DIC is associated with a falling platelet count, decreased fibrinogen, but the clotting factors may be normal, especially when one considers that the acute phase response may shorten the APTT and increase fibrinogen. For an excellent review see BMJ 2003;327:974-7.



[Q: 934] OnExamination -
Haematology

A 30-year-old female presents to the antenatal clinic with her first pregnancy. During the interview she reports that she has been entirely well but her sister had had a deep vein thrombosis in her second pregnancy. A thrombophilia screen shows that she is heterozygous for factor V Leiden.

Which is the most appropriate action for this patient?

- 1- She should be informed to seek medical attention if she becomes aware of calf swelling or pain
- 2- She should be treated with Aspirin 75mg daily
- 3- She should be treated with prophylactic low molecular weight Heparin
- 4- She should be treated with prophylactic unfractionated Heparin
- 5- She should receive Warfarin

Answer & Comments

Answer: 1- She should be informed to seek medical attention if she becomes aware of calf swelling or pain

Although she is heterozygous for Factor V Leiden, she has not had a previous thrombotic event.

There is no need to anticoagulate her throughout pregnancy. However she is at increased risk- pregnant and FVL- and should be very alert to the symptoms and signs of a thrombotic event. There is no evidence of benefit from aspirin to reduce her thrombotic risk.



[Q: 935] OnExamination - Haematology

In sickle cell disease:

- 1- The Sickledex test involves adding a reagent to blood, which allows the nature of the haemoglobinopathy to be determined
- 2- It is caused by the substitution of glutamic acid by valine at position 4 on the beta chain of haemoglobin
- 3- The erythrocytes of Haemoglobin AS patients can sickle at a pO_2 of 5 to 6 kPa (40-50 mmHg)

- 4- The erythrocytes of Haemoglobin SC patients may sickle at a pO_2 of 4 kPa (30 mmHg)
- 5- Exchange transfusions prior to major surgery on HbSS patients, aims to lower the HbS concentration to 60%

Answer & Comments

Answer: 4- The erythrocytes of Haemoglobin SC patients may sickle at a PO_2 of 4 kPa (30 mmHg)

Sickle cell disease is a haemoglobinopathy caused by the substitution of glutamic acid by valine at position 6 (from the N-terminal) of the beta chain. Inherited as an autosomal gene, heterozygous (HbAS) and homozygous (HbSS) forms exist. A low partial pressure of oxygen (PO_2) causes HbS to polymerise and precipitate, resulting in sickling of the erythrocyte. HbSS patients sickle at PO_2 of 5 ? 6 kPa and HbAS patients sickle at PO_2 of 2.5 - 4 kPa. A mild disease is produced when heterozygotes for HbS combine with other haemoglobins e.g. Haemoglobin C, thus creating HbSC. Sickling occurs at around 4 kPa. Diagnosis of sickle cell disease requires the detection of HbS. The Sickledex test involves the addition of reagent to blood; turbidity confirming the presence of HbS, but it gives no information on other haemoglobins. Haemoglobin electrophoresis is the only investigation that determines the nature of the haemoglobinopathy.



[Q: 936] OnExamination - Haematology

What is the mechanism of action of low-molecular-weight heparin?

- 1- Activation of plasminogen
- 2- Chelation of calcium
- 3- Inhibition of activated factor X
- 4- Inhibition of antithrombin

5- Inhibition of vitamin K-dependent carboxylase

Answer & Comments

Answer: 3- Inhibition of activated factor X

The shorter-chain low-molecular-weight (LMW) fractions of heparin inhibit activated factor X but have less effect on thrombin (and on coagulation in general) than the HMW species.



[Q: 937] OnExamination - Haematology

A 12-year-old boy was diagnosed with Haemophilia A. His uncle from the mother's side also has the same condition although his mother is well. The parents of the boy are worried about their next child suffering with the same condition.

What is the chance of the next child having the disease?

- 1- 0%
- 2- 25%
- 3- 50%
- 4- 75%
- 5- 100%

Answer & Comments

Answer: 2- 25%

Haemophilia is an X linked recessive disease. The mother is the carrier of the disease. There will be 50% chance in her sons to have the disease and all of her daughters will be carriers. However, it is not mentioned about the sex of the next child in this question. The overall chance of the next child to have the disease will be 25% and phenotypically normal child will be 75%.



[Q: 938] OnExamination - Haematology

A 73-year-old man presented with a two week history of breathlessness and easy bruising.

Investigations show:

Haemoglobin 6.9 g/dL (13.0-18.0)

White cell count $0.4 \times 10^9/L$ (4-11)

Platelet count $9 \times 10^9/L$ (150-400)

Bone marrow aspirate all cellular elements reduced

Which drug is the most likely cause of these abnormalities?

- 1- Acyclovir
- 2- Amiloride
- 3- Amoxicillin
- 4- Paracetamol
- 5- Trimethoprim

Answer & Comments

Answer: 5- Trimethoprim

There is a pancytopenia and marrow aspirate shows reduction in production of all cellular elements. Trimethoprim is the drug most likely of these 5 to cause depression of haematopoiesis as this picture would be particularly unusual with paracetamol, amiloride acyclovir and amoxicillin.



[Q: 939] OnExamination - Haematology

A 75-year-old woman receives 2 units of packed red cells following a hip replacement. One week later her haemoglobin concentration had fallen by 4 g/l.

Which one of the following would be most likely to indicate a delayed transfusion reaction?

- 1- conjugated hyperbilirubinaemia
- 2- elevated D-dimer concentration

- 3- haemoglobinuria
- 4- haemosiderinuria
- 5- positive direct antiglobulin test

Answer & Comments

Answer: 5- positive direct antiglobulin test

The features suggest immune haemolysis with DAT being diagnostic. A is inappropriate as it is unconjugated bilirubin that is raised in haemolysis. B,C and D are not going to be diagnostic of an immune haemolytic transfusion reaction.



[Q: 940] OnExamination - Haematology

A 69-year-old male presents with tiredness and dyspnoea and is diagnosed with acute myeloid leukaemia.

Which of the following is the most important prognostic factor?

- 1- Elevated lactate dehydrogenase activity
- 2- Karyotype of bone marrow
- 3- Monocytic morphology
- 4- Number of blasts in bone marrow
- 5- White cell count at diagnosis

Answer & Comments

Answer: 2- Karyotype of bone marrow

A, C, and D have no prognostic value. White cell count at diagnosis is however important, but most important is the karyotype of bone marrow, as this result stratifies patients into lower risk, standard risk and poor risk, which has prognostic significance.



[Q: 941] OnExamination - Haematology

A 56-year-old male was admitted for a total hip replacement due to osteoarthritis. There was no other medical history and physical

examination was normal. A routine pre-operative FBC showed:

Haemoglobin 11 g/dl (11.5-16.5)
 Platelet count $170 \times 10^9/L$ (150-400)
 White cell count $25 \times 10^9/L$ (4-11)
 Neutrophil count $5 \times 10^9/L$ (1.5-7)
 Lymphocyte count $19 \times 10^9/L$ (1.5-4)
 Monocyte count $0.9 \times 10^9/L$ (0-0.8)
 Eosinophil count $0.1 \times 10^9/L$ (0.04-4)
 Basophil count $0.08 \times 10^9/L$ (0-0.1)
 His Blood film shows mature lymphocytes

What is the most appropriate initial management for this patient?

- 1- Cancel the patient's operation
- 2- Chlorambucil
- 3- Fludarabine
- 4- Observation
- 5- Prednisolone

Answer & Comments

Answer: 4- Observation

The most significant abnormality on the full blood count is the lymphocytosis, with mature lymphocytes seen on film. In this age group the most likely diagnosis is a low grade lymphoproliferative disorder e.g. Chronic Lymphocytic Leukaemia. This, as mentioned, is a low grade condition, and does not require immediate treatment; patients undergo a period of observation, often quite long, before any treatment is indicated.

The indication for treatment would include:

- 1. Disabling B symptoms
- 2. Lymphocyte doubling time of < 6 months
- 3. Bone Marrow compromise
- 4. Autoimmune haemolysis or immune thrombocytopenia.

He is never going to be cured from this condition, and therefore it would not be necessary to delay/ cancel surgery. He may be slightly more at risk of infection, due to immune dysfunction that accompanies these conditions, and the surgeons should be aware of this.



[Q: 942] OnExamination -
Haematology

A 41-year-old African man has a history of multiple episodes of sudden onset of severe abdominal pain and back pain lasting for hours. Each time this happens, his peripheral blood smear demonstrates numerous sickled erythrocytes.

A haemoglobin electrophoresis shows 94% Hgb S, 5% Hgb F, and 1% Hgb A2. He now has increasing pain in his right groin radiating to the anterior aspect of the thigh and to the knee. His temperature was 38° and examination of his hip revealed pain on internal rotation. A radiograph reveals irregular bony destruction of the femoral head.

The most likely organism to be responsible for these findings is?

- 1- Candida albicans
- 2- Clostridium perfringens
- 3- Group B streptococcus
- 4- Salmonella species
- 5- Yersinia pestis

Answer & Comments

Answer: 4- Salmonella species

Salmonella osteomyelitis is seen in patients with sickle cell anemia. Other organisms that are frequent causes for osteomyelitis with sickle cell anemia include Staphylococcus aureus and gram negatives such as Klebsiella.

Why Salmonella species predominate in patients with Sickle Cell Disease instead of

Staphylococcus aureus is a matter of debate. Etiology of Osteomyelitis Complicating Sickle Cell Disease. Pediatrics 1998;101;296-297



[Q: 943] OnExamination -
Haematology

A 17-year-old girl who had completed treatment for acute lymphoblastic leukaemia six months previously, presents with a short history of marked, right hip pain and associated limp.

What is the most likely diagnosis?

- 1- Avascular necrosis of the femoral head
- 2- Gout
- 3- Osteoarthritis
- 4- Pseudogout
- 5- Septic arthritis

Answer & Comments

Answer: 1- Avascular necrosis of the femoral head

Avascular necrosis of the femoral head can occur as a consequence of her treatment or the disorder itself. At age 17, osteoarthritis is particularly unlikely. Gout too is unlikely (considering she completed treatment six months ago) unless she had relapsed (high white cell count) or had some other risk factors. She would be considered to be no more likely to get septic arthritis or pseudogout than anyone who had not previously had acute lymphoblastic leukaemia, if in remission.



[Q: 944] OnExamination -
Haematology

An 82-year old man presents to his General Practitioner with a six month history of fatigue and increasing exertional dyspnoea.

Investigations show:

Haemoglobin 7.5 g/dL

MCV 112fL

White blood cells $3.12 \times 10^9/L$

Neutrophils 34%

Blasts 1%

Platelets $12 \times 10^9/L$

A bone marrow aspirate stained with Perl's stain showed ring sideroblasts.

What is the most likely diagnosis?

- 1- Aplastic anaemia
- 2- Chronic myeloid leukaemia
- 3- Metastatic bone marrow infiltration
- 4- Myelodysplastic syndrome
- 5- Myelofibrosis

Answer & Comments

Answer: 4- Myelodysplastic syndrome

The patient has a macrocytic anaemia, thrombocytopenia and neutropenia with a small number of circulating blasts. This suggests a diagnosis of myelodysplastic syndrome and is supported by the finding of ring sideroblasts in the marrow.

Ring sideroblasts contain an abnormally high concentration of iron usually stored in perinuclear mitochondria. Perl's stain (which stains for iron) shows this iron deposition as a dark ring around the margin of the nucleus.



[Q: 945] OnExamination - Haematology

A 68-year-old man complained of tiredness and lethargy. On examination there was 2 cm hepatomegaly and 7 cm splenomegaly.

Investigations show

Haemoglobin 17.4 g/dL (13.0-18.0)

White cell count $39.4 \times 10^9/L$ (4-11)

White cell differential:

Neutrophils $22.2 \times 10^9/L$ (1.5 - 7)

Lymphocytes $1.1 \times 10^9/L$ (1.5 - 4)

Monocytes $1.0 \times 10^9/L$ (0 - 0.8)

Eosinophils $0.4 \times 10^9/L$ (0.04 - 0.4)

Basophils $2.1 \times 10^9/L$ (0 - 0.1)

Metamyelocytes $1.2 \times 10^9/L$

Myelocytes $10.9 \times 10^9/L$

Myeloblasts $1.3 \times 10^9/L$

Nucleated RBC 3 per 100 rbc

Platelet count $585 \times 10^9/L$ (150 - 400)

What is the most likely diagnosis?

- 1- Acute myeloid leukaemia
- 2- Chronic myeloid leukaemia
- 3- Essential thrombocythaemia
- 4- Myelofibrosis
- 5- Primary proliferative polycythaemia (rubra vera)

Answer & Comments

Answer: 2- Chronic myeloid leukaemia

The presentation is typical with vague symptoms of malaise and splenomegaly. The blood film also shows the typical high White Cell Count and there are all stages of myeloid cell maturation present in the peripheral blood with the metamyelocytes suggesting CML. Thrombocythaemia is also seen in CML.



[Q: 946] OnExamination - Haematology

An 85-year-old patient from an elderly care home, experiences sudden onset of dyspnea and palpitations. A pulmonary ventilation-perfusion scan is performed and indicates a high probability for a perfusion defect involving a pulmonary arterial branch.

Which of the following findings or conditions is the one that is the most important factor favouring development of her complaint?

- 1- neutrophilia
- 2- Cirrhosis of the liver

- 3- Poor nutrition
- 4- An increased platelet count
- 5- Generalized atherosclerosis

Answer & Comments

Answer: 4- An increased platelet count

This would lead to a prothrombotic state, increasing the risk of pulmonary embolism. Cirrhosis, and possibly poor nutrition, would lead to decreased production of coagulation factors thus prolonging the INR. A neutrophilia would suggest infection leading to ventilation defect, and not a perfusion defect. Atherosclerosis would pre-dispose to arterial thrombo-embolus.



[Q: 947] OnExamination -
Haematology

B cell CLL

- 1- thrombocytopenia often autoimmune
- 2- reduced immunoglobulins are a risk for recurrent bacterial infections
- 3- Stage A disease should be treated with chemotherapy
- 4- late transformation to ALL occur in the majority of patients
- 5- diffuse infiltration of bone marrow indicates good prognosis

Answer & Comments

Answer: 2- reduced immunoglobulins are a risk for recurrent bacterial infections

Immune thrombocytopenia only in 2%. Hypogammaglobulinaemia predisposes to encapsulated bacteria eg pneumococcus/H influenzae - causes death in 30% cases. Two transformations in CLL - CLL/PL (10%) and Richter syndrome (5% = high grade non-hodgkins lymphoma). Treatment only for Stage B, C and A with clear evidence of progression.



[Q: 948] OnExamination -
Haematology

A 17-year-old male with glucose-6-phosphate dehydrogenase deficiency presents with tiredness and is noticed to be jaundiced. These features have developed since he developed a mild chest infection one week ago.

Which one of the following is the most likely haematological finding?

- 1- Haemoglobinuria
- 2- low mean cell volume
- 3- Positive direct antiglobulin test
- 4- Reduced reticulocyte count
- 5- Spherocytes present on blood film

Answer & Comments

Answer: 1- Haemoglobinuria

G6PD deficiency is a red cell enzymopathy that can lead to acute intravascular haemolysis after exposure to certain drugs, infection etc.

You would therefore get haemoglobinuria but would not get a positive direct antiglobulin test. The MCV and reticulocyte count would be high due to haemolysis.

There is a form of G6PD deficiency where there is a chronic low level haemolysis, where there are spherocytes seen- but the clinical information points to intravascular haemolysis after an infection.



[Q: 949] OnExamination -
Haematology

A 59-year-old male is referred with an abnormal full blood count. He had presented to his general practitioner with a flu like illness which has since subsided but a FBC revealed a platelet count of $800 \times 10^9 /l$ which has remained persistently elevated but with no other abnormality on the FBC. He is otherwise

entirely asymptomatic and no abnormalities are noted on examination.

Which of the following is the most appropriate treatment for this patient?

- 1- Aspirin
- 2- Anagrelide
- 3- Hydroxurea
- 4- Plateletpheresis
- 5- Observation

Answer & Comments

Answer: 5- Observation

There are a number of adverse prognostic markers for essential thrombocythemia: age > 60, symptomatology - particularly thrombosis and platelet count above 1500. Generally the prognosis is extremely good in ET with survival of over 2 decades expected. This patient would be regarded as low risk and hence observation only employed. The risk of bleeding can also be a problem and although you may think that aspirin would be appropriate the evidence is conflicting.



[Q: 950] OnExamination - Haematology

A 20-year-old caucasian student returns from Ghana with a spiking temperature and nocturnal sweats. She has 0.5% of red blood cells infected with Plasmodium falciparum.

Select one of the following answers relating to quinine therapy in this case:

- 1- quinine contraindicated in those taking mefloquine prophylactically
- 2- quinine must always be given parenterally initially
- 3- pregnancy is a contraindication for quinine
- 4- glucose level should be monitored in those on treatment with quinine
- 5- dose of quinine should be reduced in liver impairment

Answer & Comments

Answer: 4- glucose level should be monitored in those on treatment with quinine

Severe malaria is indicated by more than 1% of RBC infected. Hypoglycaemia is an important side-effect of quinine therapy and should be monitored in those having intravenous quinine. The initial dose should NOT be reduced in those severely ill with renal/hepatic impairment. Intravenous infusion of quinine reserved for severe or cerebral malaria (most deaths from M.falciparum occur in first 96 hours of starting treatment).



[Q: 951] OnExamination - Haematology

A 19-year-old man with glucose-6-phosphate dehydrogenase deficiency wishes to travel to Africa.

Which one of the following should he be advised to avoid?

- 1- primaquine
- 2- loperamide
- 3- mefloquine
- 4- ibuprofen
- 5- yellow fever vaccine

Answer & Comments

Answer: 1- primaquine

G6PD deficiency is inherited in an X-linked fashion and predisposes RBCs to haemolysis. Drugs recognised to predispose to acute haemolysis in G6PD deficiency include antimalarials such as Primaquine, sulphonamides, Nitrofurantoin and Nalidixic acid.



[Q: 952] OnExamination -
Haematology

You are called to A+E to assess a 21-year-old student who has presented with bloody diarrhoea. The diarrhoea started two weeks previously, and was associated with increasing nausea and malaise, and mild swelling of the lower limbs. She was having difficulty passing urine. She had eaten steak from the local butcher at a friends barbeque the day before developing diarrhoea. On examination she was pale, with evidence of petechiae over her legs. Her face appeared puffy. Blood pressure was 160/95.

On examination she was afebrile, but had a tachycardia, and crackles on inspiration at both lung bases. There was an old appendectomy scar in the right iliac fossa.

Investigations:

Haemoglobin 8.5 g/dL

White cell count $13.2 \times 10^9/L$

Neutrophils $9.5 \times 10^9/L$

Platelets $35 \times 10^9/L$

PT 12 sec

APTT 34 sec

Fibrinogen 4 g/dL

Serum sodium 139 mmol/L

Serum potassium 6.1 mmol/L

Serum urea 40 mmol/L

Serum creatinine 411 $\mu\text{mol/L}$

Serum albumin 27 g/L

Dipstick urine Blood ++ Protein +

What is the single most important next investigation to determine the diagnosis ?

- 1- ASO titres
- 2- Renal tract ultrasound
- 3- Stool culture
- 4- Transthoracic echocardiogram
- 5- Urine microscopy

Answer & Comments

Answer: 3- Stool culture

This patient has haemolytic uraemic syndrome (HUS). It typically presents with a triad of ARF, Microangiopathic haemolytic anaemia and thrombocytopenia with normal clotting. HUS is a complication of infection with verocytotoxin producing *Escherichia coli* usually of the serotype O157:H7. Toxins produced in the intestine enter the blood and bind to endothelial cells in target organs. Endothelial cell damage leads to platelet and fibrin deposition with resultant fragmentation of circulating red blood cells and microvascular occlusion. The syndrome has also been reported after infections with coxsackie, echovirus and shigella. HUS is characterised by the sudden onset of haemolytic anaemia with fragmentation of red blood cells, thrombocytopenia and acute renal failure after a prodromal illness of acute gastroenteritis often with bloody diarrhoea. Clinical signs include increasing pallor, haematuria, oliguria and purpura. Jaundice is occasionally seen. Hypertension may be present. Typical results show an anaemia, thrombocytopenia, and often a neutrophilia. Blood film shows fragmented erythrocytes. U and E - typical of acute renal failure. Normal coagulation and fibrinogen. Neurological complications- stroke, seizure and coma occur in 25% of patients, rarely pancreatitis, pleural and pericardial effusions. Approx 5% of patients will develop end stage renal failure. Long term renal sequelae range from proteinuria to chronic renal failure. Therapy is supportive with correction of anaemia, correction of uraemia by early dialysis, strict fluid balance and treatment of hypertension. Major differential diagnosis is 1) sepsis with DIC -presents with abnormalities of clotting parameters. 2)TTP - Thrombotic thrombocytopenic purpura presents with microangiopathic hemolytic anemia, thrombocytopenic purpura, neurologic abnormalities, fever, and renal disease.

Renal abnormalities tend to be more severe in HUS. Although once considered variants of a single syndrome, recent evidence suggests that the pathogenesis of TTP and HUS is different. Patients with TTP lack a plasma protease that is responsible for the breakdown of von Willebrand factor (vWF) multimers and these accumulate in the plasma. The activity of this protease is normal in patients with HUS. Until the test for vWF protease activity becomes available, differentiation between HUS and TTP is based on the presence of CNS involvement in TTP and the more severe renal involvement in HUS. In HUS, 90% of patients are children and a history of prodromal diarrheal illness is more common. The therapy of choice for TTP is plasma exchange with fresh frozen plasma.



[Q: 953] OnExamination - Haematology

A 53-year-old male is receiving treatment with imatinib for chronic myeloid leukaemia.

Which of the following is imatinib?

- 1- Inhibits p53
- 2- Inhibits HER
- 3- Inhibits guanylate cyclase
- 4- Inhibits MAP kinase
- 5- Inhibits tyrosine kinase

Answer & Comments

Answer: 5- Inhibits tyrosine kinase

Imatinib is an inhibitor of tyrosine kinase and is used in the treatment of conditions such as CML and GIST tumours. It inhibits TK on abl proto-oncogene, c-kit and the PDGF-R. In CML, the Philadelphia chromosome leads to a fusion protein of abl with bcr (breakpoint cluster region), termed bcr-abl. As this is now a continuously active tyrosine kinase, imatinib is used to decrease bcr-abl activity.



[Q: 954] OnExamination - Haematology

A 67-year-old woman presents with acute severe back pain. She is normally fit and well, but there is a strong family history of osteoporosis.

Hb 10.6 g/dl (12-16)

MCV 85 (80-90)

Calcium 2.9 mmol/l (2.2-2.6)

Phosphate 2.2 mmol/l (0.8-1.2)

alkaline phosphatase 126 iu/l (50-150)

Total protein 76g/l (60-83)

albumin 30g/l (35-45)

What is the most likely underlying diagnosis?

- 1- Metastatic disease
- 2- Multiple myeloma
- 3- Osteoporosis
- 4- Paget's disease
- 5- Sarcoidosis

Answer & Comments

Answer: 2- Multiple myeloma

This patient has hypercalcaemia/hyperphosphataemia and hyperglobulinaemia (The globulin level is raised at 46g/l total protein - albumin = 46. A Normal level should be below 36g/l). This together with normocytic anaemia and probable vertebral collapse would be highly suggestive of multiple myeloma. She needs serum immunoelectrophoresis, urinary Bence-Jones protein and bone marrow biopsy. The hyperphosphataemia in multiple myeloma is due to reduced renal excretion which may be directly due to renal impairment or interference with excessive protein load.



[Q: 955] OnExamination - Haematology

An 18-year-old Asian female is noted to have

gingival hypertrophy by her dentist.

Which of the following is most likely to be responsible for her presentation?

- 1- carbamazepine
- 2- scurvy
- 3- lead poisoning
- 4- phenytoin
- 5- sodium valproate

Answer & Comments

Answer: 4- phenytoin

The inclusion of 'asian' descent in this question is intended as a distractor. Gum hypertrophy may be seen in conditions such as acute myeloid leukaemias and with drugs such as phenytoin. Scurvy (vitamin C deficiency) is associated with bleeding gums. Lead toxicity is associated with pigmentation of the gingiva. Carbamazepine is not associated with gingival hyperplasia but recognised SEs include ataxia, drowsiness and blood dyscrasias.



[Q: 956] OnExamination - Haematology

A 22-year-old male student is admitted with weakness and tiredness. He has otherwise been well.

Examination reveals a petechial rash on the lower legs and conjunctival pallor. He takes no medication and denies any illicit drug use.

Investigations reveal:

Haemoglobin 4 g/dl

White cell count $1 \times 10^9/L$

Platelets $20 \times 10^9/L$

Clotting profile Normal

U+Es, liver function tests Normal

Which of the following is the likely diagnosis

- 1- Acute myeloid leukaemia
- 2- Acute lymphocytic leukaemia

- 3- Aplastic anaemia
- 4- Henoch-Schönlein Purpura
- 5- Hodgkin's lymphoma

Answer & Comments

Answer: 3- Aplastic anaemia

This patient appears to have complete suppression of all his marrow components suggesting aplastic anaemia. The acquired condition may be associated with drug therapy such as cytotoxics, Chloramphenicol, infections such as viral hepatitis, ionising radiation and chemicals.



[Q: 957] OnExamination - Haematology

A 30-year-old male patient presents with sudden deterioration and haematuria 15 minutes after starting blood transfusion.

His pulse rate is 120 beats per minute and blood pressure is 70/ 40 mmHg.

Which of the following is the most likely cause?

- 1- ABO incompatibility
- 2- Anaphylaxis to anaesthetic agents
- 3- Disseminated intravascular coagulation
- 4- Graft versus host disease
- 5- Rhesus incompatibility

Answer & Comments

Answer: 1- ABO incompatibility

Immediate life threatening reactions with intravascular haemolysis are caused by complement activating IgG or IgM antibodies. They are usually ABO antibodies and these reactions can occur after transfusion of a few millilitres of blood.



[Q: 958] OnExamination -
Haematology

A 52-year-old male presents with a history of lethargy and epistaxis over the last one month. Examination reveals numerous bruises over arms and legs, splenomegaly and retinal haemorrhages. A full blood count shows:

Haemoglobin 7 g/dL (11.5-16.5)

White cell count $14 \times 10^9/L$ (4-11)

Platelet count $20 \times 10^9/L$ (150-400)

His blood film reveals white cells predominantly myeloblasts and promyelocytes

Which one of the following investigations would be of most prognostic value?

- 1- Bone marrow aspiration
- 2- Bone marrow trephine biopsy
- 3- Cerebrospinal fluid examination
- 4- Cytogenetic karyotype
- 5- Immunophenotyping

Answer & Comments

Answer: 4- Cytogenetic karyotype

The history, full blood count results and the blood film is suggestive of Acute Myeloid Leukaemia, as there are numerous myeloblasts on film.

Of the answers given the Cytogenetic Karyotype is of most prognostic value. The cytogenetic karyotype divides people into three categories: Good Risk, Standard Risk and Poor Risk.



[Q: 959] OnExamination -
Haematology

A 60-year-old male presents with bruising and tiredness. Examination reveals 4 finger breadth splenomegaly and his results reveal:

Haemoglobin 11 g/dl (11.5-16)

White cell count $100 \times 10^9/L$

Platelets $900 \times 10^9/L$

Blood film reveals a neutrophilia, basophilia, numerous myelocytes and 4% myeloblasts

Which of the following is likely to be present in this patient?

- 1- BCR-ABL gene fusion only
- 2- Deletion chromosome 13
- 3- Deletion 11q13
- 4- Normal chromosomal analysis
- 5- Translocation 9;22

Answer & Comments

Answer: 5- Translocation 9;22

The Philadelphia chromosome (translocation 9;22) is present in approx 90% of subjects with CML. The molecular consequences of this translocation is the generation of the fusion bcr-abl gene which creates an abnormal protein stimulating white cell growth. Only 5% of cases have the bcr-abl fusion gene only without the typical Philadelphia chromosome.

Deletion of Ch13 is associated with a poorer prognosis in Multiple Myeloma.



[Q: 960] OnExamination -
Haematology

A 70-year-old female presents for investigation of fatigue and weight loss. Investigations reveal:

haemoglobin 9.0 g/dL (11.5 - 16.5)

white cell count $2.0 \times 10^9/L$ (4-11)

platelet count $250 \times 10^9/L$ (150 - 400)

total protein 74 g/L (61 - 76)

albumin 28 g/L (37 - 49)

urea 16 mmol/l (3-7)

creatinine 250 micromol/L (60 - 110)

plasma glucose 6.5 mmol/L (3.0 - 6.0)

urine dipstick analysis protein+ blood+

renal ultrasound normal

Which one of the following investigations would be most appropriate for this patient?

- 1- 24 hour urinary protein estimation
- 2- Measurement of anti-glomerular basement membrane (anti-GBM) antibodies
- 3- Measurement of anti-neutrophil cytoplasmic antibodies (ANCA)
- 4- plasma protein electrophoresis
- 5- renal angiography

Answer & Comments

Answer: 4- plasma protein electrophoresis

This patient may well have myeloma as reflected by the anaemia, leucopaenia and elevated non-albumin protein concentration. Thus plasma protein electrophoresis would be the investigation of choice in this patient.



[Q: 961] OnExamination -
Haematology

Which one of the following is true of IgE?

- 1- Is present in plasma in the same concentration as IgG
- 2- Is increased acutely in an asthmatic attack
- 3- Crosses the normal placenta
- 4- Is increased in the serum of atopic individuals
- 5- Is involved in type 2 hypersensitivity

Answer & Comments

Answer: 4- Is increased in the serum of atopic individuals

IgG is the predominant form of immunoglobulin in plasma at a concentration around 10,000 times that of IgE. IgG crosses the placenta to confer immunity to the fetus but IgE does not. IgE is involved in arming mast cells and basophils. IgE causes mast cells to release vasoactive amines, such as histamine, producing an inflammatory

response which can result in a type I hypersensitivity reaction. IgE is responsible for allergen-mediated diseases such as anaphylaxis, asthma and atopy. Total serum IgE is frequently increased in those with atopy but serum IgE does not rise acutely during an asthmatic attack.



[Q: 962] OnExamination -
Haematology

If a patient with chronic renal failure is treated with erythropoietin (EPO), *which of the following will be expected in this patient?*

- 1- Decreased pure red cell aplasia
- 2- Decreased risk of hypertension
- 3- Decreased risk of thrombosis
- 4- Increased well being
- 5- Reduced appetite

Answer & Comments

Answer: 4- Increased well being

Increased viscosity is seen in EPO therapy which may exacerbate hypertension and there is also increased risk of thrombosis. Pure red cell aplasia is a rare unwanted effect due to stimulation of antibodies by administered EPO which cross reacts with patient's endogenous EPO. Improvement in haemoglobin level results in the increased well being and better appetite.



[Q: 963] OnExamination -
Haematology

A 24-year-old male presents after developing a bluish discolouration of the body, lips and nails. He denies any relevant past medical history. Examination reveals a central cyanosis and a grey complexion.

Investigation revealed:

Haemoglobin 17.0 g/dL (13.0-18.0)

paO₂ 13.0 kPa (11.3-12.6)

SaO₂ (using an oximeter) 85% (>95)

What is the most likely diagnosis?

- 1- Argyria
- 2- Cyanotic congenital heart disease
- 3- Haemochromatosis
- 4- Methaemoglobinaemia
- 5- Methylene blue poisoning

Answer & Comments

Answer: 4- Methaemoglobinaemia

This patient is otherwise well and has no specific features of congenital heart disease (clubbing etc). He appears desaturated with sats of 85% yet good pO₂. This is a typical description of methaemoglobinaemia which is the accumulation of reversibly oxidised methaemoglobin causing reduced oxygen affinity of the Hb molecule with consequent cyanosis. It can occur due to an inherited condition or as a consequence of drugs such as nitrites.

Argyria is colloidal silver toxicity.



[Q: 964] OnExamination - Haematology

A 35-year-old lady with a history of two previous lower limb deep vein thromboses presents with a further DVT.

She has a thrombophilia screen performed, which shows the presence of lupus anticoagulant.

What is the best course of action?

- 1- Aspirin
- 2- Aspirin and Warfarin
- 3- Long term low molecular weight heparin
- 4- Warfarin for 6 months
- 5- Warfarin lifelong

Answer & Comments

Answer: 5- Warfarin lifelong

This patient has recurrent DVTs and has been shown to have the presence of the lupus anticoagulant. Under the circumstances, evidence would suggest that lifelong anticoagulation with warfarin is required maintaining an INR above 2.5.



[Q: 965] OnExamination - Haematology

A 60-year-old Chinese man has been started on quinine for leg cramps by his General Practitioner. He presents, a week later, with 5 days of darkened urine and 2 days of increasing breathlessness, back pain and fatigue. Investigations show a haemoglobin of 7.0 g/dl and raised reticulocyte count.

Which of the following best explain this drug reaction?

- 1- autoimmune haemolytic anaemia
- 2- glucose-6-phosphate dehydrogenase deficiency
- 3- hereditary spherocytosis
- 4- pyruvate kinase deficiency
- 5- sickle cell disease

Answer & Comments

Answer: 2- glucose-6-phosphate dehydrogenase deficiency

G6PDH (X-linked recessive) is seen in African, Mediterranean, Iraqi Jew, South East Asian and Chinese people and predisposes to a haemolytic anaemia reaction with drugs or infection. Implicated drugs include - aspirin, sulphonamides, antimalarials, and quinine / quinidine. The haemolytic anaemia is non-immune (DAT -ve). Pyruvate Kinase Deficiency is autosomal recessive and presents as a chronic haemolytic anaemia exacerbated by viral infections. Hereditary spherocytosis is

characterised by variable chronic non-immune haemolysis exacerbated by infections.



[Q: 966] OnExamination -
Haematology

You are asked to provide advice on a 35-year-old woman who is admitted under the maxillo-facial surgeons for extraction of wisdom teeth. The only concern was that she had developed prolonged bleeding following a tooth extraction 10 years previously and had required suturing. Besides this, she gave no other history of bleeding.

What is the most likely diagnosis?

- 1- factor IX deficiency
- 2- factor V Leiden
- 3- Factor XII deficiency
- 4- Primary antiphospholipid syndrome
- 5- von Willebrand's Disease

Answer & Comments

Answer: 5- von Willebrand's Disease

Not that much given away by this history just the issue of a prolonged bleed after prior dental extraction. The most likely diagnosis when considering this patient is von Willebrand's disease which is an autosomal dominant condition and is one of the commonest bleeding disorders. Most cases are mild, with bleeding after only mild injury, particularly mucosal membrane injuries. The condition is due to a reduction or structural abnormality of von Willebrand's factor, which has the dual role of promoting normal platelet function and stabilising coagulation factor VIII. Von Willebrand's disease can give normal results on screening tests, and diagnosis may require specialist investigation. Most patients with mild disease respond to desmopressin (DDAVP), but clotting factor concentrates are needed for a minority.



[Q: 967] OnExamination -
Haematology

In the consideration of Disseminated Intravascular Coagulation (DIC), which of the following statements is most correct?

- 1- The presence of DIC does not increase mortality from the underlying disease
- 2- In DIC associated with sepsis secondary to retained products of conception, treatment of antibiotics will alleviate the process
- 3- Organ failure is a common finding in DIC
- 4- The intrinsic pathway is not involved in the pathophysiology of DIC
- 5- There are no randomised control trials to guide treatment in DIC

Answer & Comments

Answer: 3- Organ failure is a common finding in DIC

DIC is caused by the enhanced and abnormally sustained generation of thrombin, and organ failure is a common finding, being as common as bleeding in DIC, and is likely to be due to fibrin deposition within the organ. The presence of DIC significantly increases mortality rates in affected patients, and treatment of the underlying cause of the DIC, e.g. sepsis, does not always lead to resolution of the condition. Recombinant human activated protein C has been shown to be effective in reducing mortality from DIC in patients with sepsis. A number of clinical trials have been published to guide treatment in DIC, one of which confirms the improved mortality with recombinant human activated protein C. Secondary bursts of thrombin formation seen in DIC are instigated by the intrinsic pathway.

For a well informed review see BMJ 2003;327:974-7.



[Q: 968] OnExamination -
Haematology

A 16-year-old girl with sickle cell disease presented with malaise and rapidly increasing dyspnoea. A full blood count showed:

Hb 5.1 g/dL

Reticulocyte count $5.5 \times 10^9/L$ (25-85)

What is the most cause?

- 1- Epstein-Bar virus
- 2- Hepatitis E virus
- 3- Human immunodeficiency virus
- 4- Human papillomavirus-16 (HPV 16)
- 5- Parvovirus B19

Answer & Comments

Answer: 5- Parvovirus B19

Aplastic crisis in SSA is caused by infection with the Parvovirus B19. The virus infects red cell progenitors in bone marrow, resulting in cessation of erythropoiesis and a very rapid drop in haemoglobin. The condition is self-limited, with bone marrow recovery occurring in 7-10 days, followed by brisk reticulocytosis.



[Q: 969] OnExamination -
Haematology

Which of the following patients with Hodgkin's disease has the worse prognosis?

- 1- 25-year-old man with inguinal lymphadenopathy
- 2- 25-year-old woman with mediastinal and inguinal lymphadenopathy
- 3- 25-year-old woman with mediastinal and inguinal lymphadenopathy and night sweats
- 4- 25-year-old man with mediastinal and inguinal lymphadenopathy and pruritis
- 5- 25-year-old man with cervical and mediastinal lymphadenopathy

Answer & Comments

Answer: 3- 25-year-old woman with mediastinal and inguinal lymphadenopathy and night sweats

Prognosis in Hodgkin's disease depends on staging and presence of B symptoms. Patient A has Stage IA disease (one lymph node area). Patient E has stage IIA disease (two lymph node areas on same side of diaphragm). Patient B and D have stage IIIA disease (disease in lymph nodes on both sides of diaphragm). Pruritis is not a B symptom and is not of prognostic significance. Patient C has stage IIIB disease, as night sweats are a B symptom.)



[Q: 970] OnExamination -
Haematology

A 17-year-old woman with non-Hodgkin's lymphoma underwent splenectomy for haemolytic anaemia. She understood that she had an enhanced risk of developing overwhelming pneumococcal sepsis and wished to know how long this risk would persist.

What is the duration of the risk?

- 1- Up to 6 months
- 2- Up to 1 year
- 3- Up to 5 years
- 4- 5 to 10 years
- 5- More than 10 years

Answer & Comments

Answer: 5- More than 10 years

The risk is thought to persist lifelong, and lifelong Penicillin prophylaxis is recommended.



[Q: 971] OnExamination -
Haematology

A 30-year-old woman presented with a deep

vein thrombosis. Her previous history included investigation for infertility. Investigations revealed: Haemoglobin 12.8 g/dl (12.5-16.5) White cell count $3.6 \times 10^9/L$ (4-11) Platelet count $35 \times 10^9/L$ (150-400)

Select one of the following investigations that is most likely to be abnormal?

- 1- Antiphospholipid antibodies.
- 2- Homocystine concentration
- 3- Platelet function test
- 4- Protein C concentration.
- 5- Indium-labelled white cell scan.

Answer & Comments

Answer: 1- Antiphospholipid antibodies.

The suggestion is that this patient has a thrombophilia, with a low platelet and white cell count. Together with the infertility a diagnosis of antiphospholipid syndrome is suggested. Although protein C deficiency is associated with thrombophilia, infertility is not a feature nor is thrombocytopaenia/leucopaenia.

Hyperhomocystinaemia is associated with arterial thrombosis.



[Q: 972] OnExamination - Haematology

A 55-year-old, asymptomatic woman with mild splenomegaly was found to have a platelet count of $650 \times 10^9/L$ on blood investigation. White blood cells and haemoglobin are within the normal range.

What is the next step in management?

- 1- Anagrelide
- 2- Hydroxycarbamide
- 3- Low dose aspirin
- 4- Observation
- 5- Plateletpheresis

Answer & Comments

Answer: 4- Observation

In essential thrombocytosis, low-risk patients have a risk of thrombosis similar to that of the age and sex-matched population and a very low risk of life-threatening bleeding, supporting close observation as the most sensible approach. Hydroxycarbamide is an adequate choice for patients 60 years of age or older who are otherwise in good health. For elderly patients with limited projected survival (less than 10 years) and who have problems with either drug compliance, 32P administration might be appropriate. Anagrelide should be offered to younger patients (less than 60) who are at high risk by virtue of a prior history of thrombosis. In patients who suffer from thrombotic episodes, especially episodes involving the microcirculation or large vessels, low-dose aspirin (100 mg/day) is usually administered. In severe, life-threatening episodes, rapid cyto-reduction may be achieved by plateletpheresis or by the administration of a single dose of 0.4 mg/kg of nitrogen mustard.



[Q: 973] OnExamination - Haematology

Which of the following conditions would be expected to be associated with a raised leukocyte alkaline phosphatase (LAP) score?

- 1- Chronic myeloid leukaemia
- 2- Infectious mononucleosis
- 3- Myelofibrosis
- 4- Pernicious anaemia
- 5- Thrombocytopaenic purpura

Answer & Comments

Answer: 3- Myelofibrosis

The LAP score aids in the differential diagnosis of chronic myelocytic leukemia (CML) versus leukemoid reaction; aids in the evaluation of

polycythemia vera, myelofibrosis with myeloid metaplasia, and paroxysmal nocturnal hemoglobinuria. Low scores have been associated with CML, PNH, thrombocytopenic purpura, and hereditary hypophosphatasia. High scores have been seen in polycythemia vera, myelofibrosis, aplastic anemia, mongolism, hairy cell leukemia, leukemoid reactions, and neutrophilia either physiological or secondary to infection. It is also increased in Hodgkin disease.



[Q: 974] OnExamination -
Haematology

A previously well 75-year-old lady presented with tiredness and a mildly raised lymphocyte count on her Full Blood Count. A blood film reports 'Smudge cells seen. Is this lady known to have Chronic Lymphocytic Leukaemia?'

What is the most appropriate next investigation to confirm this lady's diagnosis.

- 1- Bone marrow aspirate
- 2- Bone marrow trephine
- 3- Immunophenotyping
- 4- Serum immunoglobulins
- 5- Ultrasound scan

Answer & Comments

Answer: 3- Immunophenotyping

"A definitive diagnosis of CLL is based on the combination of a lymphocytosis and characteristic lymphocyte morphology and immunophenotype." British Committee for Standards in Haematology Guideline for CLL diagnosis 2005

The other tests are additional investigations all used in the workup of CLL.



[Q: 975] OnExamination -
Haematology

A 28-year-old man presented with recurrent nose bleeds and iron deficiency anaemia.

A Chest X-ray found a shadow over the right lung base and auscultation in this area revealed a bruit.

Which of the following is the most likely diagnosis?

- 1- Ehlers-Danlos syndrome
- 2- Hereditary haemorrhagic telangiectasia
- 3- Idiopathic thrombocytopenic purpura
- 4- von Willebrand's disease
- 5- Wegener's granulomatosis

Answer & Comments

Answer: 2- Hereditary haemorrhagic telangiectasia

This is hereditary haemorrhagic telangiectasia (Osler-Weber-Rendu syndrome) characterised by bleeding from telangiectasia on mucous membranes such as the nose, mouth and GI tract. Clinical examination reveals telangiectasia on the skin. AV malformation may be seen in the lung (as in this case) or brain.



[Q: 976] OnExamination -
Haematology

A 60-year-old lady with bruising is investigated and found to have the following Full Blood Count.

Haemoglobin 13 x 10⁹/L (11.5 - 16.5)

White cell count 6.3 x 10⁹/L (4 - 11)

Platelet count 15 x 10⁹/L (150 - 400)

She refuses to give consent to a bone marrow biopsy.

What is the most appropriate management plan?

- 1- Intravenous immunoglobulin
- 2- No treatment
- 3- Oral prednisolone
- 4- Platelet transfusion
- 5- Splenectomy

Answer & Comments

Answer: 3- Oral prednisolone

This lady most likely has Idiopathic Thrombocytopenic Purpura. The history should highlight any drug causes (not mentioned here) and a blood film would help exclude leukaemia. A bone marrow examination is useful especially in the older person. Platelet transfusion would not be helpful without treating the underlying cause. No treatment is often an option but this lady is older and has bruising. Given the circumstances the best management plan is to treat with steroid.



[Q: 977] OnExamination - Haematology

A 16-year-old boy presents with a haemarthrosis that developed in his left knee following an injury in the garden. His investigations show:

Platelet count $260 \times 10^9/L$ (150 - 400)

Prothrombin time 13 s (11.5 - 15.5)

Activated partial thromboplastin time 80 s (30 - 40)

Factor VIII 110 IU/dL (50 - 150)

Which of the following is the most likely diagnosis?

- 1- Antiphospholipid syndrome
- 2- Antithrombin III deficiency
- 3- Haemophilia A
- 4- Haemophilia B
- 5- von Willebrand's disease

Answer & Comments

Answer: 4- Haemophilia B

An elevated APTT could be due to treatment with heparin, haemophilia, von Willebrand's disease or antiphospholipid syndrome. A normal Factor VIII would suggest Haemophilia B where there is lack of Factor IX. A prolonged

APTT can be seen in von Willebrand's disease but Factor VIII activity would be low. The presentation is not consistent with antiphospholipid syndrome and would also, typically, be associated with thrombocytopenia.



[Q: 978] OnExamination - Haematology

A 14-year-old boy presents with excessive bleeding from a tooth cavity following an extraction at the dentist. His investigations show:

Haemoglobin $13.2 \times 10^9/L$ (13 - 18)

Platelet count $260 \times 10^9/L$ (150 - 400)

White cell count $8 \times 10^9/L$ (4 - 11)

Prothrombin time 14 s (11.5 - 15.5)

Activated partial thromboplastin time 45 s (30 - 40)

Factor VIII 45 IU/dL (50 - 150)

Which of the following is the most likely diagnosis?

- 1- Disseminated intravascular coagulation
- 2- Haemophilia A
- 3- Haemophilia B
- 4- Idiopathic thrombocytopenic purpura
- 5- von Willebrand's disease

Answer & Comments

Answer: 5- von Willebrand's disease

This young boy with excessive bleeding has a slightly raised APTT and slightly reduced Factor VIII. Haemophilia is therefore unlikely and von Willebrand's is the most likely. DIC and ITP would typically be associated with thrombocytopenia.



[Q: 979] OnExamination - Haematology

A 56-year-old man is found to have a

macrocytic anaemia with a megaloblastic bone marrow.

Which of the following causes of macrocytosis is the most likely cause?

- 1- Alcohol
- 2- Aplastic anaemia
- 3- Folate deficiency
- 4- Myelodysplasia
- 5- Reticulocytosis

Answer & Comments

Answer: 3- Folate deficiency

A megaloblastic bone marrow occurs in vitamin B₁₂ or folate deficiency and with some cytotoxic drugs. The other causes of macrocytosis do not cause a megaloblastic bone marrow appearance.



[Q: 980] OnExamination - Haematology

A 34-year-old Asian lady presented with tiredness and lethargy. Her full blood count shows:

Haemoglobin 10.3 g/dl (11.5 - 16.5)

Platelet count 320 x 10⁹/L (150 - 400)

White Cell Count 10.6 x 10⁹/L (4 - 11)

MCV 68 fl (80 - 96)

HbA₂ 5.2% (2 - 3)

Which of the following is the most likely diagnosis?

- 1- Acute myeloid leukaemia
- 2- Beta-thalassaemia major
- 3- Beta-thalassaemia trait
- 4- Hereditary spherocytosis
- 5- Sickle cell disease

Answer & Comments

Answer: 3- Beta-thalassaemia trait

Microcytic anaemia would immediately raise the suspicion of iron deficiency perhaps from GI or menstrual blood loss. However, the MCV here is disproportionately low. This combined with a raised HbA₂ makes the diagnosis of beta-thalassaemia trait the most likely diagnosis.

"The diagnosis of beta thalassemia minor usually is suggested by the presence of an isolated, mild microcytic anemia, target cells on the peripheral blood smear, and a normal red blood cell count. An elevation of Hb A₂ (2 alpha-globin chains complexed with 2 delta-globin chains) demonstrated by electrophoresis or column chromatography confirms the diagnosis of beta thalassemia trait. The Hb A₂ level in these patients usually is approximately 4-6%. In rare cases of concurrent severe iron deficiency, the increased Hb A₂ level may not be observed, although it becomes evident with iron repletion. The increased Hb A₂ level also is not observed in patients with the rare delta-beta thalassemia trait."



[Q: 981] OnExamination - Haematology

A 28-year-old, primigravid woman developed a swollen painful left leg at 12 weeks gestation.

Doppler ultrasound of her leg venous system showed a left popliteal vein thrombosis.

Which one of the following treatments is associated with the greatest risk to the foetus?

- 1- Aspirin
- 2- Intravenous unfractionated Heparin
- 3- Subcutaneous low molecular weight Heparin
- 4- Subcutaneous unfractionated Heparin
- 5- Warfarin

Answer & Comments

Answer: 5- Warfarin

Oral anticoagulants are teratogenic and should not be given in the first trimester of pregnancy.

Oral anticoagulants cross the placenta, and increase the risk of fetal and placental haemorrhage. Aspirin appears to be relatively safe as are heparins.



[Q: 982] OnExamination - Infectious disease

The antibiotic combination Quinipristin and Dalfopristin are

- 1- effective against resistant mycobacterium TB.
- 2- indicated in subjects with chronic renal impairment.
- 3- particularly effective in the treatment of pseudomonas infection in Cystic fibrosis.
- 4- administered orally.
- 5- Effective against multi-resistant Staphylococcus aureus

Answer & Comments

Answer: 5- Effective against multi-resistant Staphylococcus aureus

Quinipristin and Dalfopristin are a synergistic combination of a streptogramin A and B respectively. They are effective against Gram positive aerobes and are particularly useful against resistant Streptococcus pneumoniae and Staphylococcus aureus. They can only be administered via a central line.



[Q: 983] OnExamination - Infectious disease

The drug of choice for the treatment of Chlamydia trachomatis infection during pregnancy is:

- 1- Metronidazole.
- 2- Cephazolin
- 3- Amoxicillin
- 4- Tetracycline
- 5- Clindamycin

Answer & Comments

Answer: 3- Amoxicillin

Chlamydia infection in the non-pregnant state is usually treated with a tetracycline, or with

erythromycin - although more recently, amoxicillin has been found to be as effective as the latter.

During pregnancy, tetracycline therapy is contraindicated because of incorporation into fetal bones and teeth. Thus, for the options listed, amoxicillin is the drug of choice.



[Q: 984] OnExamination - Infectious disease

Which one of the following measures would be most effective in reducing transmission of E coli O157:H7 during an outbreak of diarrhea caused by this organism?

- 1- Drinking only boiled water
- 2- Ensuring that meat products are thoroughly cooked
- 3- Giving antibiotics to individuals who are positive for Escherichia coli on stool culture
- 4- Hand washing before preparing food
- 5- Isolation of individuals with diarrhoea

Answer & Comments

Answer: 2- Ensuring that meat products are thoroughly cooked

Cattle are a major reservoir of Escherichia coli O157:H7 and contaminated meat is the most commonly implicated source of outbreaks. Raw meat should be separated from cooked and ready to eat food. Hands should be washed after handling raw meat. Antibiotics are not routinely indicated and patients should be educated on personal hygiene.



[Q: 985] OnExamination - Infectious disease

A young teenager presents with fever and headache. He has received oral Amoxicillin for 3 days.

Which of the following CSF findings would exclude a partially treated meningitis?

- 1- Negative gram stain
- 2- A CSF glucose of 45% of blood glucose
- 3- A white cell count of 50
- 4- A negative CSF culture
- 5- Negative Kernig's Sign

Answer & Comments

Answer: 3- A white cell count of 50

The assessment of children with suspected bacterial meningitis who have already received antibiotic therapy is a diagnostic conundrum. This applies to about 25-50% of children, so it is an important problem. Partial treatment may reduce the incidence of positive CSF gram stains to <60%, and it also reduces the ability to grow the bacteria, particularly meningococcus. CSF glucose, protein, neutrophils and bacterial antigen testing or PCR should be completely unaffected.



[Q: 986] OnExamination - Infectious disease

The antibiotic combination Quinipristin and Dalfopristin are

- 1- effective against resistant mycobacterium TB.
- 2- indicated in subjects with chronic renal impairment.
- 3- particularly effective in the treatment of pseudomonas infection in Cystic fibrosis.
- 4- administered orally.
- 5- Effective against multi-resistant Staphylococcus aureus

Answer & Comments

Answer: 5- Effective against multi-resistant Staphylococcus aureus

Quinipristin and Dalfopristin are a synergistic combination of a streptogramin A and B respectively. They are effective against Gram

positive aerobes and are particularly useful against resistant Streptococcus pneumoniae and Staphylococcus aureus. They can only be administered via a central line.



[Q: 987] OnExamination - Infectious disease

Which of the following statement is true of infections with Mycobacterium tuberculosis:

- 1- non-sputum producing patients are non-infectious
- 2- a positive tuberculin test indicates active disease
- 3- lymph node positive disease requires longer treatment than pulmonary disease
- 4- in pregnant women treatment should not be given until after delivery
- 5- pyrazinamide has high activity against active extracellular organisms

Answer & Comments

Answer: 1- non-sputum producing patients are non-infectious

Only untreated smear positive pulmonary TB is likely to be infectious. Active disease may be indicated by grade III/IV response to tuberculin. 80% of individuals with history of BCG vaccination have grade I/II response. All forms of pulmonary TB may be treated equally except tuberculous pleural effusion which may require drainage (with large effusions causing breathlessness) and adjunct corticosteroids to delay reaccumulation. Length of treatment for other forms are bone TB 9 months, meningitis 1 year, drug resistance 2 years. Streptomycin has high activity against extracellular organisms whilst pyrazinamide have high activity against intracellular organisms.



[Q: 988] OnExamination - Infectious disease

Twenty one people are on a Nile boat cruise and present one week into their cruise with

diarrhoea.

What is the most likely causative organism?

- 1- Campylobacter
- 2- Cryptosporidium parvum
- 3- Entamoeba histolytica
- 4- Giardia lamblia
- 5- Shigella species

Answer & Comments

Answer: 5- Shigella species

The most likely organism from this history is Shigella which accounts for approx 15% of all travellers diarrhoea.



[Q: 989] OnExamination - Infectious disease

An 18-year-old male presented with a two-week history of dysuria and purulent penile discharge. Gram stain of a urethral swab showed Gram-negative intracellular diplococci.

What specific treatment should he receive?

- 1- Cefixime
- 2- Cephadrine
- 3- Ciprofloxacin
- 4- Co-amoxiclav
- 5- Crystalline penicillin

Answer & Comments

Answer: 1- Cefixime

Neisseria gonorrhoea occurs in young adults and is often preceded by a migratory tendonitis or arthritis. Gram's stain is positive in 25% and culture positive in 50%. Current UK guidelines recommend first-line treatment with either cefotaxime, cefixime or spectinomycin may be given (as a stat dose). Fluoroquinolones are no longer used as first-line treatment due to the high rate of resistance.

"In the UK, the majority of patients with gonorrhoea are treated in dedicated sexual health clinics. The current recommendation is for ceftriaxone or cefixime as first line therapy; no resistance to either drug has yet been reported in the UK. Levels of spectinomycin resistance in the UK are less than 1%, which would make it a good choice in theory, but intramuscular spectinomycin injection is very painful.

Azithromycin (given as a single dose of 2g) is recommended if there is concurrent infection with chlamydia. A single dose of oral ciprofloxacin 500mg is effective if the organism is known to be sensitive, but fluoroquinolones were removed from the UK recommendations for empirical therapy in 2003 because of increasing resistance rates. In 2005, resistance rates for ciprofloxacin were 22% for the whole of the UK (42% for London, 10% for the rest of the UK)."



[Q: 990] OnExamination - Infectious disease

A 35-year-old man presented with cellulitis of his right leg. On examination he was mildly confused and febrile (40.1?) with a pulse was 120 / minute and BP 80/55 mmHg. He was treated with intravenous benzylpenicillin and flucloxacillin. Group A Streptococcus was isolated from two sets of blood cultures. There was no significant clinical improvement after 24 hours.

What antibiotic should be added?

- 1- Ciprofloxacin
- 2- Clindamycin
- 3- Gentamicin
- 4- Rifampicin
- 5- Vancomycin

Answer & Comments

Answer: 2- Clindamycin

The patient has a severe cellulitis with features of Streptococcal toxic shock syndrome. Streptococcal TSS is mediated via Streptococcal exotoxins. Although clindamycin is a bacteriostatic antibiotic, it acts by switching-off protein synthesis within bacteria; this in turn will lead to decreased exotoxin expression, thereby removing the mediators of TSS.



[Q: 991] OnExamination - Infectious disease

Which of the following statements concerning zoonotic diseases is true?

- 1- Brucellosis is characterised by neutrophil leucocytosis.
- 2- Brucellosis is a recognised cause of spondylitis.
- 3- Toxoplasmosis causes visceral larva migrans.
- 4- Toxoplasmosis causes vasculitic anterior uveitis.
- 5- Serological evidence of toxoplasmosis is rare in adults.

Answer & Comments

Answer: 2- Brucellosis is a recognised cause of spondylitis.

Answer: 2) Brucellosis is a recognised cause of spondylitis.

Brucellosis is a zoonosis, spreading from infected animals particularly cattle. There are 4 species, melitensis, abortus, suis, and canis. Pasteurisation of milk has decreased the incidence in the UK dramatically. Brucella are gram negative bacilli which are fastidious. There is usually a history of exposure, and the symptoms are rather non-specific with fever, malaise, arthralgia and depression. 35% have hepatosplenomegaly. Leukopenia is common, and 75% have a positive blood culture (90% of bone marrow cultures will be positive). Toxoplasma is most frequent in farming

communities where contact occurs with cats, and patients eat raw meat. Clinical manifestations include: focal choroidoretinitis, granulomatous uveitis, optic atrophy, retinal detachment, cataract, posterior uveitis and glaucoma.



[Q: 992] OnExamination - Infectious disease

Which of the following statements is true of psittacosis (ornithosis):

- 1- It is only a risk from contact with psittacines (parrots), not other birds
- 2- It usually causes many polymorphs to be present in the sputum
- 3- It is more of a risk to children than to adults who are exposed to birds
- 4- It does spread from person to person
- 5- Infection responds rapidly to penicillin therapy

Answer & Comments

Answer: 4- It does spread from person to person

Chlamydia psittaci is endemic in birds including psittacine birds, canaries, finches, pigeons and poultry. Pet owners, vets and zoo keepers are most at risk. Rare in children. Person-person transmission occurs especially in a hospital environment. Sputum Gram stain reveals a few leucocytes and no predominant bacteria. Few signs/few lab/xray findings. Positive serology with complement-fixing antibodies. treat with tetracycline.



[Q: 993] OnExamination - Infectious disease

Which of the following is a feature of Vancomycin-resistant enterococci?

- 1- cause resistant infective diarrhoea
- 2- produce an enzyme that inactivates vancomycin

- 3- may be found in healthy community volunteers not recently hospitalized
- 4- high dose ampicillin is the treatment of choice
- 5- are commonly vancomycin-dependent

Answer & Comments

Answer: 3- may be found in healthy community volunteers not recently hospitalized

a-When they cause clinical problems they are usually UTI, bacteraemia, wound infections, neonatal infections, endocarditis etc. b-They alter peptidoglycan precursors used to build cell walls. Vancomycin binds to D-ala-D-ala but the resistant enterococci have D-ala-D-lac or D-ala terminating precursors. They acquire genes that produce enzymes to change the precursors. c-2% in UK general practice, 28% in Belgium. Community reservoir in meat, poultry and cheese. d-only if the MIC of ampicillin is not too high. Anecdotal evidence exists for its use in E. faecalis endocarditis. (20g / day) e-Some strains only. An explanation for this curious process is that there is an inability to produce cell walls because the vancomycin-sensitive precursor genes have been turned off and the resistant ones only appear in the presence of vancomycin. (Source: Am J Med 1997;102:284-293)



[Q: 994] OnExamination - Infectious disease

A 62-year-old lady is due to attend her dentist for a hygiene appointment for scaling. She has a history of mitral valve prolapse with regurgitation and is allergic to penicillin.

Which of the following antibiotics would be the most appropriate choice for prophylaxis in this lady?

- 1- Oral clindamycin
- 2- Oral doxycycline

- 3- Oral erythromycin
- 4- Oral ofloxacin
- 5- No antibiotic prophylaxis

Answer & Comments

Answer: 1- Oral clindamycin

Oral clindamycin is recommended for penicillin allergic patients where prophylaxis is required against infective endocarditis.



[Q: 995] OnExamination - Infectious disease

A 57-year-old woman develops a blistering rash around the midriff and is diagnosed with herpes zoster. She is treated with acyclovir.

Through inhibition of which of the following does acyclovir function?

- 1- Integrase
- 2- Polymerase
- 3- Protease
- 4- Reverse transcriptase
- 5- Thymidine kinase

Answer & Comments

Answer: 2- Polymerase

Acyclovir is a synthetic purine nucleotide analogue and as such is a specific inhibitor of herpesvirus DNA polymerase.



[Q: 996] OnExamination - Infectious disease

An 80-year-old man with a 5 year history of diet controlled type 2 diabetes mellitus presents with a one month history of cough and weight loss. He was a non-smoker and had difficulty expectorating. Investigation revealed a HbA1c of 7% but his chest X-ray showed a cavitating left apical shadow.

Which of the following investigations would be most useful in establishing the cause of this lesion?

- 1- bronchoscopy
- 2- CT scan of the chest
- 3- Gastric aspirate for acid-fast bacilli
- 4- Percutaneous lung biopsy
- 5- Sputum for acid-fast bacilli

Answer & Comments

Answer: 1- bronchoscopy

The differential diagnosis of cavitating lung lesions is shown below. The most likely diagnosis in this non-smoking man is post primary tuberculosis as a result of reactivation of quiescent disease. He has several risk factors including increasing age and diabetes. The patient is unable to produce sputum therefore undertaking a bronchoscopy with bronchial washings for microscopy staining and culture is the investigation of choice. Gastric lavage for AFB is unpleasant for the patient has a lower yield than bronchoscopy and is therefore rarely undertaken now. Causes of Cavitating Masses on CXR: (a) Lung abscess (b) Tuberculosis (c) Fungal infection (eg. Histoplasmosis, Coccidioidomycosis) (d) Malignancy (e) Wegener's Granulomatosis) commonly (f) Rheumatoid Arthritis) multiple (g) Infarction)



[Q: 997] OnExamination - Infectious disease

A 30-year-old schoolteacher is admitted with headache, photophobia and neck stiffness. His temperature is 39.0°C, pulse rate 120 beats/min and he has no skin rash or focal neurological signs his Glasgow coma scale is 15/15. A CT scan shows no contraindication to lumbar puncture. CSF is obtained and Gram stain shows gram-positive cocci, subsequent culture confirms a pneumococcal meningitis.

What chemoprophylaxis should be offered to his pupils?

- 1- Azithromycin
- 2- Ceftriaxone
- 3- Ciprofloxacin
- 4- no chemoprophylaxis required
- 5- Rifampicin

Answer & Comments

Answer: 4- no chemoprophylaxis required

Chemoprophylaxis is not normally indicated for close contacts of those with pneumococcal meningitis. Chemoprophylaxis with Rifampicin, Ceftriaxone, Ciprofloxacin or azithromycin is used for meningococcal meningitis. Close contacts of Haemophilus influenzae meningitis should receive rifampicin; children under 2 years should be vaccinated.



[Q: 998] OnExamination - Infectious disease

Which of the following is true of Giardia lamblia infection?

- 1- is often symptomatic
- 2- is usually spread by contaminated meats
- 3- is eradicated by mebendazole
- 4- causes steatorrhoea
- 5- diagnosed by stool culture

Answer & Comments

Answer: 4- causes steatorrhoea

Usually acquired by the faeco-oral route. Many individuals excreting cysts are asymptomatic and are thus carriers. Others have diarrhoea, steatorrhoea, abdominal pain and nausea. Diagnosed by stool microscopy - if negative, parasite found in duodenal aspirates or biopsy. Testing of serum antibodies against G lamblia trophozoites is not useful in

diagnosing current infection. Eradicate with metronidazole (or quinacrine, tinidazole, ornidazole, furazolidone, paromomycin). Mebendazole is used in treating hookworm infections eg ascaris, whipworm and threadworm.



[Q: 999] OnExamination - Infectious disease

Which of the following is true concerning Whooping cough (pertussis)?

- 1- is a greater threat to children during the second 6 months of life, after maternal antibody has declined, than during the first 6 months
- 2- may lead to hemiplegia
- 3- is characteristically associated with a polymorph leucocytosis
- 4- is associated with convulsions less frequently than is the case with other febrile conditions
- 5- rapidly resolves with antibiotic treatment

Answer & Comments

Answer: 2- may lead to hemiplegia

Whooping cough (pertussis) is caused by the bacterium *Bordetella pertussis*. *B. pertussis* is a very small Gram-negative aerobic coccobacillus that appears singly or in pairs. Infection is characterised by paroxysms of coughing. Lymphocytosis is typically found. Hemiplegia is a recognised effect of severe whooping cough. The pertussis vaccine is estimated to be 63% to 94% effective in the DPT shot.



[Q: 1000] OnExamination - Infectious disease

Varicella-Zoster infection :

- 1- Gamma Interferon is an effective treatment.

- 2- produces latent infection within the anterior horn cells
- 3- causes urinary incontinence
- 4- causes congenital limb deformity
- 5- associated pneumonitis is equally common in smokers and nonsmokers

Answer & Comments

Answer: 4- causes congenital limb deformity

Varicella-Zoster infection causes Herpes Zoster and Chicken Pox.

Herpes Zoster is due to reactivation of the virus lying dormant in the cells of dorsal root ganglion. Autonomic involvement can cause urinary retention. Pregnancy increases risk of pneumonitis. Chicken pox in the first and second trimester can produce a syndrome of skin scarring, hypoplastic limbs, eye and CNS impairments. Pneumonitis is uncommon in children, with incidence of 0.3% in immunocompetent adults. The risk is higher in smokers. Antiviral treatment include acyclovir and vidarabine.



[Q: 1001] OnExamination - Infectious disease

A 50-year-old man presented to hospital feeling generally unwell for 3 days. He had returned from a business trip to Thailand six weeks previously and had taken mefloquine as prophylaxis against malaria. On examination he was afebrile, temperature 36.5 C, Pulse was 100/minute and regular, his BP was 85/60 mm Hg.

Investigations showed:

Hb 14.2 g/dL (13.0-18.0)

WBC $19.0 \times 10^9/L$ (4- 11)

Neutrophils $18.0 \times 10^9/L$ (1.5-7.0)

AST 72 IU/L (1-31)

Alkaline phosphatase 255 (45-105)

What is the most likely diagnosis?

- 1- Acute HIV infection (seroconversion illness)
- 2- Dengue fever
- 3- Gram-negative bacteraemia
- 4- Hepatitis B
- 5- Mefloquine-induced hepatitis

Answer & Comments

Answer: 3- Gram-negative bacteraemia

A difficult question. The neutrophilia essentially excludes most viral causes. The presentation is not typical of acute HIV (fever, pharyngitis, rash & lymphadenopathy). Mefloquine can cause abnormal LFTs, but is not common. Even though the patient is afebrile, the likeliest diagnosis is therefore Gram-negative bacteraemia.



[Q: 1002] OnExamination - Infectious disease

Which of the following is correct regarding Herpes simplex encephalitis?

- 1- shows a peak incidence in the Autumn
- 2- is associated with a polymorphonuclear pleocytosis in the CSF
- 3- produces a diffuse, evenly distributed inflammation of cerebral tissues
- 4- produces a typical EEG pattern with lateralised periodic discharges at 2 Hz
- 5- should be treated with acyclovir as soon as the diagnosis is confirmed by urgent CSF viral antibody titres

Answer & Comments

Answer: 4- produces a typical EEG pattern with lateralised periodic discharges at 2 Hz

This EEG pattern is seen but not diagnostic. Winter is the peak incidence. A lymphocytosis is characteristic in the CSF. Temporal lobe location is typical not diffuse. Immediate treatment required on clinical suspicion - don't wait!



[Q: 1003] OnExamination - Infectious disease

A 27-year-old pop singer presented with a two month history of loose motions and weight loss. He underwent a HIV antibody test and was found to be positive.

The presence of which of the following diseases indicates a diagnosis of AIDS?

- 1- Brucellosis
- 2- Glandular fever
- 3- Lyme disease
- 4- Oral candidiasis
- 5- Pulmonary Tuberculosis

Answer & Comments

Answer: 5- Pulmonary Tuberculosis

AIDS defining diseases are:

Cytomegalovirus disease (other than liver, spleen, or nodes)

Cytomegalovirus retinitis (with loss of vision)

Encephalopathy, HIV-related

Herpes simplex: chronic ulcer(s) (>1 month's duration); or bronchitis, pneumonia, or esophagitis

Histoplasmosis, disseminated or extrapulmonary

Isosporiasis, chronic intestinal (>1 month's duration)

Kaposi's sarcoma

Lymphoma, Burkitt's (or equivalent term)

Lymphoma, primary, of brain

Mycobacterium avium complex or M. kansasii, disseminated or extrapulmonary

Mycobacterium tuberculosis, any site (pulmonary or extrapulmonary)

Mycobacterium, other species or unidentified species, disseminated or extrapulmonary

Pneumocystis carinii pneumonia
 Pneumonia, recurrent
 Progressive multifocal leukoencephalopathy
 Salmonella septicemia, recurrent
 Toxoplasmosis of brain
 Wasting syndrome due to HIV



[Q: 1004] OnExamination -
 Infectious disease

Which of the following is least true regarding IgA nephropathy?

- 1- Is the most common glomerulonephritis in the world
- 2- Predominantly affects young men
- 3- Commonly follows a sore throat
- 4- May be associated with a rash and arthritis
- 5- Light chains may be found in the urine

Answer & Comments

Answer: 5- Light chains may be found in the urine

IgA nephropathy (Berger's disease) is the most common glomerulonephritis worldwide, and characteristically affects young males, presenting with frank haematuria after an episode of pharyngitis. However it may also present with proteinuria, microscopic haematuria, renal failure or hypertension. It is probably part of a spectrum of disease with Henoch Schoenlein Purpura, which presents with arthritis, rash, abdominal pain and nephritis. In both there are mesangial IgA deposits in the kidney.



[Q: 1005] OnExamination -
 Infectious disease

A 29-year-old man is diagnosed with pulmonary tuberculosis. A blood sample is sent to determine his acetylator status prior to starting therapy. This showed that he was a

fast acetylator. He was subsequently started on anti-tuberculous therapy that included isoniazid.

Which of the following statements is correct?

- 1- There is an increased risk of convulsions
- 2- There is an increased risk of drug resistance
- 3- There is an increased risk of hepatitis
- 4- There is an increased risk of megaloblastic anaemia
- 5- There is an increased risk of peripheral neuropathy

Answer & Comments

Answer: 3- There is an increased risk of hepatitis

Isoniazid is metabolized primarily by acetylation and dehydrazination. The rate of acetylation is genetically determined. Approximately 50 percent of Blacks and Caucasians are "slow acetylators", and the rest are "rapid acetylators"; the majority of Eskimos and Orientals are "rapid acetylators". Fast acetylation leads to higher blood levels of the toxic metabolite acetylisoniazid and thus, to an increase in toxic reactions - hepatitis which is x250 more common than in slow acetylators.. Fast acetylators on the other hand require higher doses but there increased tubercle resistance is not a problem.



[Q: 1006] OnExamination -
 Infectious disease

Twenty of thirty patients in an adult ward develop colicky abdominal pain and diarrhoea without vomiting between 21:00 and 01:00 hrs. Meat stew was served for lunch at noon.

Which of the following is the likely diagnosis?

- 1- Bacillus cereus
- 2- Clostridium perfringens
- 3- Enterotoxigenic Escherichia coli
- 4- Enterovirus

5- Staphylococcus aureus

Answer & Comments

Answer: 2- Clostridium perfringens

This food poisoning with no vomiting and an incubation period between 9-13 hrs incubation is typical of Clostridium perfringens. The history is too long for a typical Staphylococcus aureus infection (vomiting a typical feature, incubation period 1-6 hrs) and rather short of enterovirus (24 hrs). The predominant symptom of B.Cereus (inc period 1-5 hrs) is marked vomiting with diarrhoea occasionally seen. Escherichia coli infection has an incubation period of 12-24hrs and is also associated with marked vomiting. Supportive treatment is all that is generally required with symptoms resolving after 24 hrs.



[Q: 1007] OnExamination - Infectious disease

You are considering starting a patient on Griseofulvin.

Which of the following statements concerning its pharmacology is true?

- 1- It is active against Candida albicans.
- 2- It is active against aspergillus.
- 3- It should not be used in renal failure.
- 4- It used for a maximum of 2 weeks.
- 5- It is associated with drug-induced Stevens Johnson syndrome.

Answer & Comments

Answer: 5- It is associated with drug-induced Stevens Johnson syndrome.

Answer: 5) It is associated with drug-induced Stevens Johnson syndrome.

For griseofulvin and Steven-Johnson syndrome read J Emerg Med 1984;2:129-135. Many

other drugs are implicated in causing Steven-Johnson syndrome.

Griseofulvin is not active against Candida albicans. It is active against trichophytons (tinea) and other dermatophytes. It is metabolised in the liver (note also it's an enzyme inducer). Only 0.1-0.2% excreted in urine. Treatment with griseofulvin is often needed for a long period, sometimes years, depending on the rate of nail growth.



[Q: 1008] OnExamination - Infectious disease

A 17-year-old girl presents with 3 day history of vaginal discharge.

What is the most likely causative organism?

- 1- Candida albicans
- 2- Bacterial vaginosis
- 3- Chlamydia trachomatis
- 4- Neisseria gonorrhoea
- 5- Trichomonas vaginalis

Answer & Comments

Answer: 1- Candida albicans

There is very little information given in this young girl's case save for the 3 day history of vaginal discharge. There is no information given with regard to pruritus, sexual exposure or whether the discharge is malodorous. Without this information it's rather pot luck, but the most likely organism would be candida as a cause of a vaginal discharge with few other symptoms.



[Q: 1009] OnExamination - Infectious disease

An 82-year-old female is reviewed as the staff of the nursing home in which she resides are concerned regarding a vaginal discharge. She has been in the nursing home for the last one year with a profound Alzheimer's dementia.

Culture of the discharge reveals *Neisseria gonorrhoeae*.

Which is the most appropriate course of action for this patient?

- 1- Contact the Police
- 2- Contact tracing of sexual partners
- 3- Informal enquiry to the nursing home
- 4- Seek advice from the MDU
- 5- Treat the patient and discharge back to the nursing home

Answer & Comments

Answer: 4- Seek advice from the MDU

These ethical questions can be quite tough to answer with accuracy. This question specifically relates to elder abuse - in this case potential elder sexual abuse. The scenario is one that is often played out in the press of a care worker that sexually abuses elderly patients in his/her care. However, you are given very little information here and what you would do is undoubtedly treat the patient and establish how the patient contracted gonorrhoea. The question states that she has a profound dementia suggesting that abuse has occurred rather than consensual sex. However, you need to establish the facts and you have a personal duty of care to the patient and next of kin to establish these before automatically contacting the police. It is likely that the police will need to be called but first it would be worth talking things through and obtaining advice from the MDU. The advice may entail establishing the set-up at the nursing home, discussing with the next of kin, social services if a social worker has been involved, finely detailing any injuries that may be present on examination and then possibly contacting the Police.



[Q: 1010] OnExamination - Infectious disease

Which of the following is true of the T cell

response to antigen?

- 1- A process of affinity maturation of the T cell receptor occurs.
- 2- Intact antigen is presented in association with self MHC molecules.
- 3- Co-operation with other cell types is required for T cell recognition of antigen.
- 4- gamma/delta + T cells respond to antigen presented in association with MHC class II molecules.
- 5- Interactions of the TcR with an appropriate Ag/MHC complex activates a resting T cell.

Answer & Comments

Answer: 3- Co-operation with other cell types is required for T cell recognition of antigen.

a) Affinity maturation in an ongoing immune response is a feature of the antibody response. There is no evidence that a similar process occurs in the T cell response.

b) MHC molecules present short antigen-derived peptides, not the intact antigen.

c) T cells recognise antigen only when presented by (self) MHC molecules on an antigen presenting cell.

d) MHC class II molecules present antigen to CD4+, alpha/beta+ T cells. It is still not clear how gamma/delta+ T cells recognise antigen, however most gamma/delta+ T cells do not appear to be restricted by (self) MHC molecules.

e) Additional 'costimulatory' signals are required to activate a resting T cell. Interaction of the TcR of a resting T cell with an appropriate Ag/MHC complex in the absence of costimulatory signals may lead to the induction of anergy.



[Q: 1011] OnExamination - Infectious disease

A 22-year-old female student attended

Casualty complaining of fever and rigors for two days. She had returned from a sabbatical in Africa six weeks previously. She was febrile (39.9°C) and a mild petechial rash was also noted. Laboratory investigations showed.

Hb 10.1 g/dL (11.5-16.5)

WBC $3.0 \times 10^9/L$ (4-11)

Platelets $115 \times 10^9/L$ (150-400)

Prothrombin time Normal

What is the most likely diagnosis?

- 1- Acute HIV infection (seroconversion illness)
- 2- Cytomegalovirus infection
- 3- Dengue fever
- 4- Plasmodium falciparum malaria
- 5- Typhoid fever

Answer & Comments

Answer: 1- Acute HIV infection (seroconversion illness)

A difficult question that partly hinges on the incubation times of these illness. The incubation time is too long for dengue, typhoid and falciparum malaria. The presentation is not typical of CMV. Acute HIV presents 2 weeks - 3 months after exposure to the virus; the illness typically consists of fever, arthritis, rash and lymphadenopathy. The presentation given here is not characteristic of acute HIV, but is the most reasonable of the options listed.



[Q: 1012] OnExamination - Infectious disease

Which one of the following statements concerning T-lymphocytes is correct?

- 1- Are the primary host response in bacterial infection
- 2- Compose the majority of lymphocytes in plasma
- 3- Are infected by Epstein-Barr virus in infectious mononucleosis

4- produce IgG

5- T cell lymphoma has a better prognosis than B cell lymphoma

Answer & Comments

Answer: 2- Compose the majority of lymphocytes in plasma

The primary host response to bacterial infections is dependent on mononuclear phagocytes and neutrophils. T-lymphocytes are involved in cell-mediated acquired immune responses, whereas B-lymphocytes are involved in humoral immunity and produce immunoglobulins. T lymphocytes compose the majority of circulating lymphocytes in plasma. Epstein-Barr virus infects B-lymphocytes and squamous epithelial cells of the oropharynx. The virus can transform B cells and epithelial cells to produce Burkitt's lymphoma, a subset of Hodgkin's lymphoma, nasopharyngeal carcinoma and oral hairy leukoplakia. T cell lymphoma makes up about 10-20% of non-Hodgkin's lymphomas and has a worse prognosis than B cell lymphoma.



[Q: 1013] OnExamination - Infectious disease

A 15-year-old female is a close contact of a student who has developed meningitis C. The last contact she had with her friend was two days ago when her friend developed headache. She has not received any previous vaccination for meningitis.

What is the most appropriate action for this girl?

- 1- No treatment is required and the girl can be reassured
- 2- Treat with rifampicin only
- 3- She should receive the meningococcal A and C vaccination only
- 4- She should receive meningococcal immunoglobulin only

- 5- She should receive the meningococcal A and C vaccination plus rifampicin

Answer & Comments

Answer: 5- She should receive the meningococcal A and C vaccination plus rifampicin

This girl runs a reasonably high risk of developing meningitis and should receive Meningitis C vaccination together with rifampicin. Antibiotics used for chemoprophylaxis are rifampicin, minocycline, spiramycin, ciprofloxacin and ceftriaxone.

More [here](http://www.hpa.org.uk/infections/topics_az/meningo/guidelines.htm)
http://www.hpa.org.uk/infections/topics_az/meningo/guidelines.htm



[Q: 1014] OnExamination - Infectious disease

Which of the following statements regarding Japanese Encephalitis is most true?

- 1- It is a DNA virus
- 2- Previous exposure to a flavivirus predisposes to increased risk of death on infection with Japanese Encephalitis
- 3- Transplacental transmission occurs
- 4- It is only recognised in travellers who have spent prolonged periods in endemic areas
- 5- Is endemic in East Africa

Answer & Comments

Answer: 3- Transplacental transmission occurs

Japanese encephalitis is an RNA virus which is endemic in India, East Asia, Malaysia and the Philippines. Previous infection by a pathogen which is a member of the flavivirus family seems to protect against serious disease or death when infection occurs with another member of the flavivirus family. For instance previous exposure to Dengue lowers the risk of death when infected by Japanese Encephalitis. Infection with Japanese

Encephalitis has been reported in travellers who have spent only short periods in endemic areas, and transplacental transmission can occur. An immunisation is available for travellers.



[Q: 1015] OnExamination - Infectious disease

Four members of a football team develop diarrhoea due to Salmonella enteritidis.

Eating which food was the most likely source of the infection?

- 1- chicken at a fast food outlet 20 hours earlier
- 2- fried rice at a takeaway 4 hours earlier
- 3- raw eggs in milk 6 hours earlier
- 4- raw oysters at a hotel 24 hours earlier
- 5- soft cheeses 48 hours earlier

Answer & Comments

Answer: 1- chicken at a fast food outlet 20 hours earlier

The incubation time for Salmonella enteritidis is 12 - 48 hours and the likely sources are poultry and eggs. Raw oysters are associated with infections such as the Norwalk agent.



[Q: 1016] OnExamination - Infectious disease

A 35-year-old man is seen 6 months after a cadaveric renal allograft. He receives azathioprine and prednisolone. He has felt generally unwell for the past week with a pyrexia of 38.6°C, anorexia and a cough productive of thick green sputum. Chest x-ray reveals a left lower lobe nodule of approximately 5cm diameter with central cavitation. Analysis of the sputum reveals long, crooked, branching and beaded gram-positive filaments.

Which of the following antimicrobials is the most appropriate initial therapy for this patient?

- 1- Ceftazidime
- 2- Co-amoxiclav
- 3- Co-trimoxazole
- 4- Erythromycin
- 5- Rifampicin and Isoniazid

Answer & Comments

Answer: 3- Co-trimoxazole

The likely diagnosis is Nocardiosis. Nocardia are aerobic, Gram-positive branching filamentous bacteria which often appear beaded on staining. Nocardiosis can be diagnosed rapidly by examination of sputum or pus with the Gram stain and a modified acid-fast stain. Pneumonia is typically found in the immunocompromised as in this case and may be a single lesion or extensive pneumonic consolidation. The drug of choice is trimethoprim-sulfamethoxazole.



[Q: 1017] OnExamination - Infectious disease

A 27-year-old man presents with fever, urethritis and arthralgia. He is found to have a swollen ankle with a pustular rash on the dorsal aspect of his foot.

What is the most likely diagnosis?

- 1- Gonococcal sepsis
- 2- Lyme disease
- 3- Reiter's syndrome
- 4- Staphylococcal arthritis
- 5- Tuberculous arthritis

Answer & Comments

Answer: 1- Gonococcal sepsis

The most likely cause for this acute presentation is gonococcal septicaemia - with

a pustular rash on the dorsum of his foot, fever, urethritis and oligoarthritis. Reiter's is associated with an acute infection - urethritis/diarrhoea and later the development of an arthritis.



[Q: 1018] OnExamination - Infectious disease

A 28-year-old man had been treated for pulmonary tuberculosis with rifampicin, isoniazid, pyrazinamide and ethambutol for four weeks. Pre-treatment liver function tests were normal but his most recent investigations revealed:

serum total bilirubin 98 micromol/l (0-18)
 serum alanine aminotransferase 620u/l (5-45)
 serum aspartate aminotransferase 450 u/l (5-45)
 serum alkaline phosphatase 720 u/l (40-110)

Which one of the following is the most appropriate next step?

- 1- Stop all treatment
- 2- Stop ethambutol
- 3- Stop isoniazid
- 4- Stop pyrazinamide
- 5- Stop rifampicin

Answer & Comments

Answer: 1- Stop all treatment

All tuberculosis patients should have pretreatment LFT, should be supervised by a chest physician and should be informed of possible side-effects of treatment. If there is no pre-existing liver disease, LFTs are only repeated (and treatment stopped) if fever, malaise, vomiting, jaundice or unexplained deterioration occurs during treatment. Regular LFT should be performed in patients with previously known chronic liver disease. If AST/ALT levels rise by 5 times normal/bilirubin level rises, then

rifampicin/isoniazid/pyrazinamide should be stopped.

If the patient is not unwell and/or has non-infectious TB, no treatment until LFT returns to normal.

If clinically unwell or sputum smear positive within 2 weeks of starting treatment, consider streptomycin and ethambutol until LFT returns to normal.

Once LFT back to normal, challenge dosages can be reintroduced sequentially in order of isoniazid, rifampicin and pyrazinamide with daily monitoring of patient's condition and LFT.

If further reaction, offending drug excluded and a suitable alternative regimen used.



[Q: 1019] OnExamination - Infectious disease

A 57-year-old woman develops a blistering rash around the midriff and is diagnosed with herpes zoster. She is treated with acyclovir.

Activation of acyclovir by which of the following is responsible for its action?

- 1- Integrase
- 2- Polymerase
- 3- Protease
- 4- Reverse transcriptase
- 5- Thymidine kinase

Answer & Comments

Answer: 5- Thymidine kinase

This is a variation on the acyclovir theme. Aciclovir acts through inhibition of viral DNA polymerase but it is a pro-hormone and first requires phosphorylation by Thymidine Kinase.



[Q: 1020] OnExamination - Infectious disease

*Which of the following concerning *Corynebacterium diphtheriae* is correct?*

- 1- Causes skin infection
- 2- Infection is often complicated by myocardial fibrosis after recovery from severe infection
- 3- Is most unlikely to cause infection in an individual with a positive Schick test
- 4- Mitis strain is generally more virulent than the intermedius strain
- 5- Toxin is better absorbed through the nasal than the pharyngeal mucosa

Answer & Comments

Answer: 1- Causes skin infection

Corynebacterium diphtheriae is a gram positive, non-spore forming, pleomorphic bacteria that is also a facultative anaerobe. *Corynebacterium diphtheriae* causes Diphtheria. Typically diphtheria attacks the respiratory system, but may also affect the skin, conjunctiva and external genitalia. Signs and symptoms include sore throat, fever, and swelling of lymph nodes in the neck and general malaise. As the disease progresses Diphtheria toxin is secreted. This destroys the membrane surface of the affected areas and replaces them with a grayish tough leathery "Pseudomembrane" made of dead tissue, leukocytes and bacteria. Toxin could also affect the heart, nerves and other organs in the body causing Heart failure, nerve damage or suffocation. Toxin can be neutralized by the immune serum produced by the host cells. Diphtheria is transmitted from person to person. Human beings are the main reservoir.



[Q: 1021] OnExamination - Infectious disease

A 52-year-old man presented to the Accident & Emergency unit with a two day history of

increasing breathlessness, productive cough and fever. He was previously fit and well with no past history of note. He was not a cigarette smoker. On examination he was febrile, temperature was 38.5°, pulse rate 100/minute and regular, blood pressure 120/80 mmHg and respiratory rate of 25 breaths/minute. Investigations:

Hb 15.0 g/dL

WBC $18.5 \times 10^9/L$

Platelets $350 \times 10^9/L$

Serum sodium 137 mmol/L

Serum potassium 4.5 mmol/L

Serum urea 5.1 mmol/L

Serum creatinine 110 $\mu\text{mol/L}$

paO₂ (arterial blood, on air) 9.0 kPa

Chest x-ray showed right middle lobe consolidation

What is the most appropriate choice of antibiotics?

- 1- Amoxicillin
- 2- Amoxicillin plus Erythromycin
- 3- Ceftriaxone
- 4- Ciprofloxacin
- 5- Co-Amoxiclav

Answer & Comments

Answer: 1- Amoxicillin

While in practice it is perfectly acceptable to give such a patient both amoxicillin and clarithromycin (B), the question tests deeper knowledge of the British Thoracic Society guidelines on the management of community-acquired pneumonia. Given this patient's symptoms, signs and results, he falls in to the 'good prognosis' category (see BTS guidelines). Adverse prognostic features include: ?Age >50 years ?Coexisting disease ?Confusion (MMS <8) ?Respiratory rate >30 ?Systolic BP <90 and/or diastolic <60 ?Raised serum urea (>7 mmol/L) ?Hypoxia (PaO₂ <

8kPa) ?Bilateral/multilobar consolidation on CXR

Essentially, he appears relatively well and could be managed at home. According to BTS guidelines, such patients could be treated with antibiotic monotherapy ?so amoxicillin alone would suffice

British Thoracic Society guidelines for the management of community-acquired pneumonia can be downloaded from:

http://www.brit-thoracic.org.uk/public_content.asp?pageid=7&catid=36&subcatid=144



[Q: 1022] OnExamination - Infectious disease

Which of the following is true of BCG vaccination?

- 1- is contraindicated in neonates
- 2- is a killed polysaccharide antigen vaccine
- 3- should be given to all children who have a strongly positive tuberculin test
- 4- is presently routinely offered in the UK at age 16 years
- 5- Provides protection against leprosy

Answer & Comments

Answer: 5- Provides protection against leprosy

a - BCG vaccine may given to newborns at high risk of exposure.

b - The BCG vaccine is an attenuated strain - it provides approximately 70% protection.

c - It should NOT be given to these children. A low reactivity Heaf test (grade 0 - 1) should be documented before administration.

d - BCG is given at Comprehensive school entry (age 11 - 13).

e - It has also found a use in stimulating the immune system for the treatment of some cancers.



[Q: 1023] OnExamination -
Infectious disease

You are an occupational health physician and have been asked by an anxious employee about contraindications to pertussis immunisation.

Which of the following is a contraindication?

- 1- Eczema
- 2- Cow's milk protein intolerance.
- 3- Fever to 39.5 C following the first dose.
- 4- Redness of >2.5cm at the injection site after the first dose.
- 5- Hydrocephalus

Answer & Comments

Answer: 3- Fever to 39.5 C following the first dose.

Answer: 3) Fever to 39.5 C following the first dose.

True contraindications to pertussis immunisation include:

- " Acute illness - until recovered.
 - " Previous reaction to pertussis:
 - o Local: an extensive area of redness and swelling which becomes indurated, involving most of the anterolateral surface of the thigh or a major part of the circumference of the upper arm.
 - o General: fever equal to or more than 39.5 C within 48 hours of vaccine, anaphylaxis, bronchospasm, laryngeal oedema, generalised collapse, prolonged hyporesponsiveness, prolonged inconsolable or high-pitched screaming of >4 hours, convulsions or encephalopathy occurring within 72 hours.
- A personal family history of allergy is not a contraindication, nor are stable neurological conditions such as cerebral palsy or spina bifida. In patients who have had a previous reaction, immunisations should be completed

with DT vaccine, and acellular vaccine considered.



[Q: 1024] OnExamination -
Infectious disease

A 15-year-old girl presents to casualty with mild gastrointestinal upset. She had recently returned from holiday where she had been swimming in the hotel pool.

What is the most likely causative organism?

- 1- Campylobacter jejuni
- 2- Cryptosporidium parvum
- 3- Salmonella enteridis
- 4- Shigella flexneri
- 5- Staphylococcus aureus

Answer & Comments

Answer: 2- Cryptosporidium parvum

Human cryptosporidiosis causes self-limited diarrhoeal illness in healthy individuals, mostly children; and severe prolonged diarrhea in patients with AIDS. Transmission is via human-to-human fecal-oral contamination. Animals are the major reservoir and outbreaks have been associated with water supplies and public swimming pools.



[Q: 1025] OnExamination -
Infectious disease

A patient is planning to travel through the southern states of America, but is worried about West Nile Virus.

Which of the following statements regarding West Nile Virus is correct?

- 1- Infection is non-fatal
- 2- Is a member of the arbovirus family
- 3- Transplacental transmission does not occur
- 4- May be associated with Poliomyelitis-like paralysis

- 5- Treatment with interferon is effective in West Nile Virus encephalitis

Answer & Comments

Answer: 4- May be associated with Poliomyelitis-like paralysis

Neurological manifestations of West Nile Virus include a poliomyelitis-like paralysis, seizures and a Parkinsonian movement disorder. West Nile Virus is a Flavivirus of the Japanese Encephalitis family, and transplacental transmission has been reported. In 2003, there were 276 deaths attributed to West Nile Virus. Interestingly, West Nile Virus is endemic in the avian population. The deaths of large numbers of birds in an area may thus herald an imminent epidemic of West Nile Virus.



[Q: 1026] OnExamination - Infectious disease

A 30-year-old man developed a febrile illness three days after returning from a holiday in Thailand. He was admitted complaining of severe myalgia. On examination he was febrile (39°C) with a diffuse macular rash on the trunk. There was no lymphadenopathy. Investigations revealed:

Haemoglobin 15.1 g/dL (13.0-18.0)

White cell count $7.5 \times 10^9/L$ (4-11)

Platelet count $105 \times 10^9/L$ (150-400)

Serum total bilirubin 18 mmol/L (1-22)

Serum alanine aminotransferase 120 U/L (5-35)

What is the most likely diagnosis?

- 1- Acute HIV infection (seroconversion illness)
- 2- Dengue fever
- 3- Hepatitis E
- 4- Secondary syphilis
- 5- Typhoid

Answer & Comments

Answer: 2- Dengue fever

The symptoms are most consistent with dengue fever. While acute retroviral syndrome (acute HIV) is associated with a widespread macular rash, it is also usually associated with pharyngitis and generalised lymphadenopathy. Hepatitis E presents in a similar manner to hepatitis A, i.e. as an acute febrile illness with jaundice. The history is too acute for secondary syphilis, which is not typically associated with myalgia. Typhoid fever is usually a diarrhoeal illness associated with subtle 'rose spots' on the abdomen.

Dengue fever is caused by an arthropod-borne flavivirus. The disease has an incubation period of approximately 7 days, followed by headaches and retro-orbital pain. Symptoms evolve rapidly and severe musculoskeletal pain is a prominent feature, with a maculopapular rash.



[Q: 1027] OnExamination - Infectious disease

A 35-year-old man returned from a two-week holiday complaining of pain in the loins and painful swollen knees. On examination he was afebrile and had significant bilateral knee effusions. Mild penile erythema was also noted. Laboratory investigations showed:

Hb 15.6 g/dL

WBC $16.2 \times 10^9/L$

Neutrophils $14.1 \times 10^9/L$

ESR 65 mm/h

Rheumatoid factor 10 IU/L

Urinalysis No cells, casts or bacteria seen

What is the most likely diagnosis?

- 1- Arthritis due to *Neisseria gonorrhoeae* infection
- 2- Lymphogranuloma venereum
- 3- Reactive arthritis

- 4- Reitter's syndrome
- 5- Rheumatoid arthritis

Answer & Comments

Answer: 1- Arthritis due to Neisseria gonorrhoeae infection

Gonococcal arthritis typically affects the knees and is the likeliest diagnosis in this scenario.



[Q: 1028] OnExamination - Infectious disease

A 17-year-old man presented to casualty complaining of difficulty breathing. He had been brought to hospital by ambulance, having collapsed shortly after being stung on the hand by a bee. On examination, his blood pressure was 80/40 mmHg, and facial swelling was noted.

Which one of the following investigations is most likely to confirm the nature of the reaction?

- 1- Haemolytic complement (CH50) level
- 2- Plasma tryptase activity
- 3- Serum complement C3 level
- 4- Serum total IgE level
- 5- Serum venom-specific IgE level

Answer & Comments

Answer: 2- Plasma tryptase activity

Type I hypersensitivity, also known as immediate or anaphylactic hypersensitivity, usually takes 15 - 30 minutes from the time of exposure to the antigen. The reaction may cause a range of symptoms from minor inconvenience to death. The reaction involves preferential production of IgE, in response to certain antigens, which in turn initiates a sequence of events leading to the release various pharmacologically active substances that are responsible for the clinical features. Diagnostic tests include skin tests,

measurement of total IgE and specific IgE antibodies against the suspected allergens. However, this question asks which of the following tests would provide confirmatory information and that would be Tryptase.

Tryptase is a neutral protease stored in mast cell secretory granules that is secreted by human mast cells. Levels in normal blood are undetectable (< 1 ng/ml). Elevated serum levels demonstrate that mast cell activation with mediator release has occurred whether triggered by IgE-mediated anaphylaxis or non-IgE-mediated anaphylactoid reactions. The greater the severity of anaphylaxis, the more likely that serum -tryptase levels will be elevated.



[Q: 1029] OnExamination - Infectious disease

Which of the following forms of encephalitis is caused by a neuroimmunological response?

- 1- Herpes simplex
- 2- Measles
- 3- HIV infection
- 4- Enteroviruses
- 5- Cytomegalovirus

Answer & Comments

Answer: 2- Measles

Encephalitis may be caused by:

- " Direct invasion by a neurotoxic virus (encephalitis).
- " Post-infectious encephalopathy: delayed brain swelling because of an immunological response to the antigen.
- " Slow virus infection, e.g. HIV or SSPE.

Direct infection is most commonly caused by enteroviruses, HSV 1 and 2, varicella, CMV, and EBV. It is also occasionally caused by respiratory viruses, HHV6, rubella or mumps.

A post-infectious illness may also be caused by measles or varicella zoster (cerebellar ataxia).



[Q: 1030] OnExamination - Infectious disease

Two strains of Escherichia coli are isolated and both are resistant to ampicillin. Strain A retains its resistance to ampicillin when grown from multiple generations in the absence of ampicillin. However strain B loses its resistance when grown in the absence of ampicillin.

Which of the following best explains the loss of antibiotic resistance in strain B?

- 1- Changes in the bacterial DNA gyrase
- 2- Downregulation of the resistance gene
- 3- Loss of a plasmid containing the resistance gene
- 4- Mutations in the resistance gene
- 5- Transposition of another sequence into the resistance gene

Answer & Comments

Answer: 3- Loss of a plasmid containing the resistance gene

Bacteria develop resistance to antibiotics by gaining genes that encode for particular proteins that offer protection to the organism. Sometimes this is by mutation and other times the gene may be acquired from another bacterial species. The genes are usually found in plasmids - circular segments of DNA separate from the bacterial chromosome. Plasmids can easily spread from one bacteria to another - a sort of resistance package that bacteria can share.



[Q: 1031] OnExamination - Infectious disease

Which of the following statements is true about immunological reactions?

- 1- Serum sickness is caused by a type II reaction.
- 2- Grave's Disease is caused by a type IV reaction.
- 3- Angio-neurotic oedema is the most severe form of type I reaction.
- 4- Urticaria usually responds to Cimetidine.
- 5- Deficiencies in the terminal components of complement increase the risk of meningococcal disease.

Answer & Comments

Answer: 5- Deficiencies in the terminal components of complement increase the risk of meningococcal disease.

Answer: 5) Deficiencies in the terminal components of complement increase the risk of meningococcal disease.

Serum sickness is due to circulating antibody-antigen complexes (Type III). Grave's Disease is due to stimulating antibody (Type V). The most severe variety of Type I reaction is anaphylaxis, with angio-oedema an intermediate reaction associated with wheeze and swelling of the lips and severe urticaria. These reactions are mediated by histamine 1 receptor stimulation. Congenital C1 inhibitor deficiency is also caused hereditary angio-oedema. Deficiencies in C1r, s, and 2-4 result in vasculitides; while deficiencies in C2, 3 and 5-8 are associated with an increased risk of septicaemia.



[Q: 1032] OnExamination - Infectious disease

A 42-year-old HIV-seropositive man presents to Casualty with a two-week history global headache. His partner says that he has become increasingly confused and disorientated. The patient's latest CD4 count, taken three weeks ago, was 50 cells/mm³. He had chosen not to take antiretroviral therapy, but was taking co-trimoxazole as prophylaxis

against *Pneumocystis carinii* pneumonia. On examination he had mild weakness of his left arm and leg in all muscle groups and a right homonymous hemianopia. Fundoscopy was normal with no evidence of papilloedema. A CT scan of his brain showed several areas of low attenuation in both cerebral hemispheres, but there was no enhancement with contrast and no mass effect.

What is the most likely diagnosis?

- 1- Cerebral lymphoma
- 2- Cerebral toxoplasmosis
- 3- HIV encephalopathy
- 4- Neurosyphilis
- 5- Progressive multifocal leukoencephalopathy

Answer & Comments

Answer: 5- Progressive multifocal leukoencephalopathy

The most likely diagnosis is Progressive multifocal leukoencephalopathy (PML), a demyelinating disease seen in advanced HIV/AIDS and caused by the JC virus. Cerebral lymphoma and cerebral toxoplasmosis are often associated with mass effect on CT brain scanning. In CNS lymphoma there is usually a solitary lesion. Cerebral toxoplasmosis is frequently associated with multiple lesions that show ring enhancement with iv contrast. HIV encephalopathy may be associated with confusion, but is not associated with this CT appearance. This is not a typical presentation of neurosyphilis in any of its forms.



[Q: 1033] OnExamination - Infectious disease

Chronic liver disease is NOT a complication of

- 1- Haemosiderosis
- 2- Hepatitis C
- 3- alpha1 antitrypsin deficiency
- 4- cystic fibrosis

- 5- haemochromatosis

Answer & Comments

Answer: 1- Haemosiderosis

50% of hepatitis C infections leads to chronic liver disease (treat with interferon-a). Liver disease from chronic cholestasis occurs in cystic fibrosis. Alpha1 antitrypsin deficiency causes both cirrhosis and emphysema. Haemochromatosis is autosomal recessive and is characterized by excessive iron deposition in various organs causing organ failure (diabetes, heart failure, chronic liver disease, hypogonadism, skin pigmentation and arthritis). Haemosiderosis usually arises due to parenteral iron overload e.g. in patients with aplastic anaemia after multiple transfusions. It is not commonly associated with cirrhosis. If cirrhosis does develop as a result of massive iron overload the condition is known as secondary haemochromatosis.



[Q: 1034] OnExamination - Infectious disease

An 35-year-old man presented with high fever, headache and mild jaundice on returning from a holiday in Spain. The group of 20 had travelled together visiting forestry on the hills with fishing trips in mountain streams.

Which of the following organisms is most likely to be responsible for their illness?

- 1- Borelia Burgdorferi
- 2- Legionella pneumophila
- 3- Leptospira icterohaemorrhagica
- 4- Mycoplasma pneumoniae
- 5- Pneumococcus

Answer & Comments

Answer: 3- Leptospira icterohaemorrhagica

Leptospirosis, or Weil's disease, is transmitted to man by animals, including rodents (rat urine and faeces), skunks, foxes, cattle, dogs.

The disease is characterized by jaundice, fever, oliguria, headache, myalgia, haemorrhagic tendencies with purpura or petechiae, and enlargement of liver and spleen.



[Q: 1035] OnExamination - Infectious disease

Which of the following is true of tetanus?

- 1- failure to culture *Clostridium tetani* from the wound would make the diagnosis doubtful
- 2- infection confers lifelong immunity
- 3- there is a characteristic EEG
- 4- *Clostridium*-specific intravenous immunoglobulin is of no benefit once spasm has started
- 5- cephalic tetanus causes severe dysphagia

Answer & Comments

Answer: 5- cephalic tetanus causes severe dysphagia

a-absence of a wound does not exclude tetanus. b-patients need to be actively immunized after recovery. c-The toxin tetanospasmin doesn't cross the blood brain barrier, it diffuses through the blood to bind to receptors containing gangliosides on the neuronal membranes of presynaptic nerve terminals in muscles. The toxin does reach the brain by axonal transport. d-it is ineffective once the toxin is attached to nervous tissue but may prevent progression. e-Cephalic meaning involving the cranial nerves usually from a wound on the head and neck. May be confused with rabies but hydrophobia never occurs. (OTM, 3e, 7.11.20)



[Q: 1036] OnExamination - Infectious disease

Regarding diphtheria which of the following statements is correct?

- 1- It is predominantly spread from cutaneous lesions.
- 2- It is characterised by an inflammatory exudate forming a greyish membrane on the buccal mucosa.
- 3- It produces a toxin which affects the myocardium, nervous and adrenal tissues.
- 4- 3 doses of toxoid provides 75% protection.
- 5- About 50 cases per year are seen in the UK.

Answer & Comments

Answer: 3- It produces a toxin which affects the myocardium, nervous and adrenal tissues.

Diphtheria is spread by droplets, through contact with soiled articles (fomites), and, in areas of poor hygiene, from cutaneous spread. The inflammatory exudate forms a greyish membrane on the tonsils and respiratory tract which may cause respiratory obstruction. Incubation is between 2 and 5 days, and patients may be infectious for 4 weeks. The toxin affects the myocardium, nervous and adrenal tissues. The immunisation has been tremendously successful, and most cases seen in the UK are imported from the Indian subcontinent or Africa. Recently, there has been a worrying epidemic of diphtheria in Russia and the newly independent states of the former Soviet Union. In 1995, 52,000 cases and 1,700 deaths were reported.



[Q: 1037] OnExamination - Infectious disease

A 23-year-old female presents 16 weeks into her pregnancy with a vaginal discharge. Further investigation confirms infection with *Chlamydia trachomatis*.

Which of the following is the most appropriate treatment for this patient?

- 1- Azithromycin
- 2- Ciprofloxacin
- 3- Co-trimoxazole

- 4- Doxycycline
5- Metronidazole

Answer & Comments

Answer: 1- Azithromycin

C. Trachomatis infection is common in pregnancy and is associated with adverse fetal outcome including spontaneous miscarriage, premature rupture of membranes and IUGR. Appropriate treatment is with macrolides such as erythromycin or azithromycin. Both doxycycline and ciprofloxacin are contraindicated in pregnancy.



[Q: 1038] OnExamination - Infectious disease

Which of the following is true of anthrax?

- 1- It is caused by an aerobic, gram negative rod.
- 2- It causes trivial disease in the host herbivore population.
- 3- Gastrointestinal anthrax is the most usual form of disease in humans.
- 4- Eshars are usually painless.
- 5- Sputum culture has a high yield in inhalational anthrax.

Answer & Comments

Answer: 4- Eshars are usually painless.

Answer: 4) Eshars are usually painless.

Anthrax will be a particularly topical question in the exam. It is caused by the gram positive, aerobic, non-motile *Bacillus Anthracis*. It produces serious disease in the herbivore host and carnivores acquire disease from either consuming the spores from the dead animal or by contact. In humans, cutaneous disease is most common and a painless, black, indurated eschar frequently forms. Mortality from cutaneous disease is 20% if untreated whereas

inhalational anthrax may have a mortality of 90% if untreated. Inhalational anthrax is associated with a poor yield from sputum culture with the greatest yield from blood culture.



[Q: 1039] OnExamination - Infectious disease

A 19-year-old man returned to the UK two weeks after working in a refugee camp in sub-Saharan Africa. On examination he was febrile, dyspnoeic and widespread inspiratory crackles were present. He had an extensive maculo-papular rash, conjunctivitis, generalized stomatitis and some bluish-grey spots on the buccal mucosa.

What is the most likely diagnosis?

- 1- Epidemic typhus
- 2- Epstein Barr virus infection
- 3- Leptospirosis
- 4- Measles
- 5- Parvovirus infection

Answer & Comments

Answer: 4- Measles

Although seldom seen in countries in which a vaccine is available, measles is a major health problem in refugee camps in Africa. The clinical picture described is characteristic. The major complications of measles involve the respiratory tract and CNS. Pneumonia may be caused by the virus itself, or through bacterial superinfection.



[Q: 1040] OnExamination - Infectious disease

A 47-year-old woman presents with high fever, rigors and myalgia. Nasal aspirate is positive for influenza virions.

Which of the following is true of her B-cell response?

- 1- The antibody response to the virus does not require T-cell help
- 2- Her B-cells express immunoglobulin on their surface
- 3- Deficiency of either CD40 or CD40L still allows an IgG response
- 4- Affinity maturation takes place in the blood stream
- 5- Memory cells are not formed as repeated infections with influenza often occur

Answer & Comments

Answer: 2- Her B-cells express immunoglobulin on their surface

B-cells usually require T-cell help for full activation. B-cells activated in the primary immune response initially produce IgM. With continuing T-cell help, B-cells then undergo heavy chain class switching and enter germinal centres in secondary lymphoid organs. The germinal centres are the sites of immunoglobulin affinity maturation and memory B-cell formation. Various factors including the nature of T-cell help, antigen exposure site and cytokine profile, determine the isotype of heavy chain produced. CD40 and CD40L are required for co-stimulation by T-cells. Deficiency of either CD40 or CD40L impairs class switching. Certain antigens can activate B-cells in the absence of T-cell help - thymus independent antigen. T-cell independent B-cell responses are mainly to carbohydrate antigen e.g. pneumococcal polysaccharide. These antigens are not processed and presented in association with MHC molecules, and therefore cannot activate T-helper cells. Most TI antigens have highly repetitive epitopes (e.g. LPS/endotoxin), which are able to cross link B-cell surface immunoglobulin and activate these cells. Some T-cell independent antigens can cause proliferation of B-cells regardless of their specificity - polyclonal B-cell activation. B cell responses to T-independent antigens consist mainly of IgM antibodies of low affinity

without the production of memory cells. The influenza virus will activate T- and B-cells, and result in memory cell production. Genetic mutation in the virus is responsible for immune evasion and repeated infections.



[Q: 1041] OnExamination - Infectious disease

A 16-year-old boy presented with fever, headache and neck stiffness for 24 hours. He had an identical illness requiring admission to hospital for 1 year previously.

Cerebrospinal fluid analysis shows White cells of 400/ml with a 90% neutrophilia and gram stain revealed scanty gram-negative diplococci.

Which component of the immune system is likely to be defective?

- 1- B lymphocytes
- 2- Complement pathway
- 3- Immunoglobulin
- 4- Neutrophils
- 5- T lymphocytes

Answer & Comments

Answer: 2- Complement pathway

This young man has a recurrent meningococcal meningitis, and deficiencies of complement C5-9 predispose to Neisseria infections (complement deficiencies). One must recognise that the diplococci seen on microscopy are those of Neisseria meningitidis.



[Q: 1042] OnExamination - Infectious disease

A 42 year-old restauranter who has been HIV positive for 8 years presents with progressive shortness of breath on exercise. The chest X-ray is normal except for prominent pulmonary arteries. Pulse oximetry demonstrates that he desaturates on exercise.

Which is the most likely diagnosis?

- 1- Pneumocystis carinii pneumonia
- 2- Primary pulmonary hypertension
- 3- Intracardiac shunt across an atrial septal defect
- 4- Pulmonary embolic disease
- 5- Anaemia

Answer & Comments

Answer: 1- Pneumocystis carinii pneumonia

The history of dyspnoea and exercise induced dyspnoea in a HIV positive male with no signs on the chest X-ray and little other data would suggest PCP until proved otherwise. Pulmonary hypertension is another possibility and occurs in HIV patients, but the most likely choice would be PCP.



[Q: 1043] OnExamination - Infectious disease

A 48-year-old man with a known history of chronic alcohol abuse presented with a three-day history of fevers, night sweats and a cough productive of purulent sputum. There was no past history of respiratory disease.

On examination he was febrile (39.1°C). Percussion note was dull over the right apex and there was bronchial breathing in this area on auscultation. The chest x-ray showed right upper lobar consolidation.

Other investigations revealed

WBC 23 x 10⁹/L

Neutrophils 18.3 x 10⁹/L

What is the most likely diagnosis?

- 1- Aspiration pneumonia
- 2- Klebsiella pneumonia
- 3- Legionella pneumonia
- 4- Mycoplasma pneumonia
- 5- Primary tuberculosis

Answer & Comments

Answer: 2- Klebsiella pneumonia

Community-acquired Klebsiella pneumonia is a disease of debilitated middle-aged and older men with alcoholism. Mortality rates are as high as 50% regardless of treatment. Klebsiella pneumonia characteristically affects one of the upper lobes of the lung, although infection of the lower lobes is not uncommon. There is an increased tendency toward abscess formation. Aspiration pneumonia typically affects in right lower lobe in persons with impaired swallowing. Legionnaires' disease is associated with contaminated air conditioning and water delivery systems. Mycoplasma pneumoniae infections have an insidious onset with malaise, myalgia, sore throat and headache. Cough is characteristically dry. CXR changes are usually patchy and involve the lower or middle lobes.



[Q: 1044] OnExamination - Infectious disease

A 82-year-old lady is admitted from her nursing home with headache, photophobia and neck stiffness. Her temperature is 39.0°C, pulse rate 115 beats/min. There is no skin rash or focal neurological signs and her Glasgow coma scale is 15/15. A CT scan shows no contraindication to lumbar puncture. CSF is obtained and Gram stain shows Gram negative cocc-bacilli, subsequent culture confirms a Haemophilus influenzae meningitis.

What chemoprophylaxis should be offered to the nurses at her home?

- 1- Azithromycin
- 2- Ceftriaxone
- 3- Ciprofloxacin
- 4- no chemoprophylaxis required
- 5- Rifampicin

Answer & Comments

Answer: 5- Rifampicin

Close contacts of *Haemophilus influenzae* meningitis should receive rifampicin; children under 2 years should be vaccinated.



[Q: 1045] OnExamination - Infectious disease

A 26-year-old man with a history of alcohol and drug abuse was admitted with a 14 day history of fever, cough and fatigue. He was emaciated. His temperature was 39.4°C. Cervical and axillary lymphadenopathy were present. Chest X-ray revealed bilateral areas of pulmonary shadowing.

Which of the following is the most likely diagnosis?

- 1- alcoholic cardiomyopathy
- 2- pneumococcal pneumonia
- 3- pneumocystis pneumonia
- 4- pulmonary tuberculosis
- 5- tricuspid endocarditis

Answer & Comments

Answer: 3- pneumocystis pneumonia

Pneumocystis carinii is the most common opportunistic infection in AIDS. This patient is at risk of HIV with the history of drug abuse. Persistent generalised lymphadenopathy may develop in HIV before the patient fulfils the criteria of AIDS. As the disease progresses, there is atrophy of the lymph nodes. Less likely is pulmonary tuberculosis which can also cause any abnormality on CXR, and involve peripheral lymph nodes. The others are unlikely to cause lymphadenopathy.



[Q: 1046] OnExamination - Infectious disease

An otherwise asymptomatic 22-year-old HIV positive male presents to the Infectious Diseases clinic.

Investigations reveal?

"viral load" 750,000 copies/ml

CD4 count 200x10⁶/ml (500-1600).

What is the most appropriate treatment strategy for this patient?

- 1- Start antiretroviral therapy
- 2- Start antiretrovirals when count is 150
- 3- Start antiretrovirals when count is 100
- 4- Start antiretrovirals together with prophylactic antibiotic therapy
- 5- Start prophylactic antibiotic therapy

Answer & Comments

Answer: 1- Start antiretroviral therapy

Both CD4 cell counts and plasma HIV RNA levels are independent predictors of clinical outcome. The most appropriate treatment strategy for this young man would be the introduction of anti retroviral therapy.

Generally, antiretroviral therapy would be initiated in asymptomatic patients with a CD4 count between 200 and 350. A HIV RNA level >30,000 copies/ml merits the introduction of antiretroviral therapy irrespective of CD4 count.



[Q: 1047] OnExamination - Infectious disease

A 28-year-old man who had had tuberculosis of the mediastinal lymph nodes diagnosed two weeks previously and who had been started on chemotherapy with rifampicin, isoniazid and pyrazinamide was admitted because of the increasing dyspnoea and stridor.

Chest X-ray showed compression of both main bronchi by carinal lymph node enlargement.

What is the next step in management?

- 1- Start prednisolone
- 2- Mediastinoscopy and biopsy
- 3- Refer for stent insertion/tracheostomy

4- Refer for urgent CT scan of the mediastinum

5- The addition of ethambutol

Answer & Comments

Answer: 1- Start prednisolone

The treatment of TB mediastinal lymphadenitis is the same as pulmonary TB. The nodes may enlarge during or after treatment as a result of hypersensitivity. Corticosteroids is effective in reducing the enlargement and hence will help the stridor and breathlessness.



[Q: 1048] OnExamination - Infectious disease

A 25-year-old male homosexual is admitted with dyspnoea and weight loss of 2 months duration. He is diagnosed with Pneumocystis pneumoniae due to AIDS.

Which of the following concerning Pneumocystis pneumonia is true?

- 1- May have an extra pulmonary presentation
- 2- It is always associated with X-ray changes
- 3- It is caused by a bacterium
- 4- Elevated serum antibodies to P. carinii are helpful diagnostically
- 5- It is best treated with intravenous pentamidine

Answer & Comments

Answer: 1- May have an extra pulmonary presentation

a-Any HIV associated condition.

b-5-15% have normal CXR (always is always false ... but not always!).

c-A fungus.

d-There is polyclonal B-cell activation in AIDS.

e-intravenous cotrimoxazole.



[Q: 1049] OnExamination - Infectious disease

A 28-year-old shop worker is referred with a 3 month history of recurrent episodes of disorientation and confusion. Her boyfriend has found her wandering around the house on several occasions, apparently with no idea of where she is or how she got there. Her mood has been very low, with frequent emotional outbursts, and she has considered leaving her job because of problems with working the computer and managing customers queries. Her boyfriend feels her condition is significantly worsening. Physical examination is normal, apart from recurrent, asymmetrical, jerks in all 4 limbs.

Which of the following investigations is likely to be MOST useful in reaching a diagnosis?

- 1- Chest X-Ray
- 2- CT head
- 3- EEG
- 4- Liver function tests
- 5- Visual evoked potentials

Answer & Comments

Answer: 3- EEG

This kind of rapid cognitive decline in a young person with myoclonus is strongly suggestive of CJD. This may be new variant (in which the EEG may be abnormal though is often normal) or sporadic in which case characteristic EEG abnormalities may be expected. The EEG in sporadic CJD may show significant abnormalities involving deep brain areas such as the thalami. Initially the changes are diffuse, and non-specific, developing into stereotyped high voltage components on a slow background. High voltage sharp waves may be synchronous with myoclonic jerks. Tonsillar biopsy for 14-3-3 protein marker has a diagnostic sensitivity of around 80% for Prion Proteins. Other investigations to exclude other causes of rapid cognitive decline, would

include MRI, lumbar puncture. CT may show non-specific changes with atrophy out of keeping with the patients age. Diagnosis is confirmed with biopsy.



[Q: 1050] OnExamination - Infectious disease

A 19-year-old male student attends casualty complaining of an urethral discharge one week after having casual unprotected sex. Gram stain shows numerous neutrophils, some of which contain gram-negative intracellular diplococci. The patient is treated with Ceftriaxone, 250 mg as an intramuscular injection. Five days later, the patient re-attends with persisting discharge.

Which of the following is the most likely cause of this discharge?

- 1- Chlamydia trachomatis
- 2- Penicillin-resistant Neisseria gonorrhoeae
- 3- Re-infection with Neisseria gonorrhoeae
- 4- Ureaplasma urealyticum
- 5- Urethral stricture

Answer & Comments

Answer: 1- Chlamydia trachomatis

This patient has been adequately treated for gonorrhoea and a persistent discharge would be unusual unless as is often the case, there is a co-infection. The patient is likely to have a non-specific urethritis due to Chlamydia trachomatis, requiring treatment with either doxycycline or erythromycin for 7-14 days.



[Q: 1051] OnExamination - Infectious disease

A 55-year-old Caucasian man presented to hospital with fever, intermittent rigors, and worsening fatigue. He had returned from a business trip to West Africa six months previously.

What is the most likely diagnosis?

- 1- Brucellosis
- 2- Leishmaniasis
- 3- Plasmodium falciparum malaria
- 4- Plasmodium ovale malaria
- 5- Typhoid fever

Answer & Comments

Answer: 4- Plasmodium ovale malaria

The Duffy blood group on the RBC acts as a receptor for P vivax. West Africans lack the Duffy blood group and therefore P ovale replaces P vivax in this region. Both P vivax and P ovale have a liver hypnozoite stage which can cause repeated relapses. P falciparum typically presents within the first 3 months of return. Visceral leishmaniasis is not endemic in West Africa, Brucellosis is a zoonosis, transmitted through contaminated and untreated milk and by direct contact with infected animals. The incubation period of brucellosis is usually one to three weeks, but sometimes may be several months. It may have either a sudden or insidious onset and is accompanied by continued, intermittent, or irregular fever. Typhoid fever presents within 1-3 weeks from return from an endemic area.



[Q: 1052] OnExamination - Infectious disease

A 45-year-old man presented with a three day history of headache and increasing confusion. On examination he was febrile with marked neck stiffness. Investigations revealed: Cerebrospinal fluid analysis (normal ranges are shown in brackets):

White cell count 600 /ml (< 5)

White cell differential > 90% neutrophils

Gram stain Gram-negative diplococci

Which one of the following antibiotics, given intravenously, is the most appropriate treatment?

- 1- Ampicillin

- 2- Benzylpenicillin
- 3- Cefuroxime
- 4- Ciprofloxacin
- 5- Gentamicin

Answer & Comments

Answer: 2- Benzylpenicillin

This is clearly a case of meningococcal meningitis. The commonest causes of bacterial meningitis in adults are:

Neisseria meningitidis (Gram negative diplococci)

Streptococcus pneumoniae (Gram positive diplococci)

TREATMENT OF BACTERIAL MENINGITIS

On the basis of Gram stain results:

Gram stain unavailable or no stainable organisms: Cefotaxime + ampicillin

Gram-positive cocci: Cefotaxime + vancomycin

Gram-positive bacilli: Ampicillin + gentamicin

Gram-negative cocci: Benzyl penicillin (Penicillin G)

Gram-negative bacilli: Cefotaxime + gentamicin

On the basis of CSF culture:

Streptococcus pneumoniae - If penicillin MIC < 0.06 micrograms/mL: Benzyl penicillin (Penicillin G) or cefotaxime - If penicillin MIC > 0.1 micrograms/mL (i.e. penicillin-resistant pneumococcus): Cefotaxime (+ vancomycin if susceptibility to broad-spectrum cephalosporins reduced)

Neisseria meningitidis: Benzyl penicillin (Penicillin G) *Haemophilus influenzae*: Cefotaxime *Listeria monocytogenes*: Ampicillin + gentamicin

Group B streptococcus: Benzyl penicillin (Penicillin G)



[Q: 1053] OnExamination - Infectious disease

A 20 year-old-woman presented with a solitary, crusted, thickened lesion on her face one month after returning from a holiday in Central America.

What is the most likely diagnosis?

- 1- Cutaneous anthrax
- 2- Cutaneous leishmaniasis
- 3- Impetigo
- 4- Leprosy
- 5- Onchocerciasis

Answer & Comments

Answer: 2- Cutaneous leishmaniasis

The patient has American ('New world') cutaneous leishmaniasis. The causative agents are of the *Leishmania* species, including *L. braziliensis*, *L. mexicana*, *L. panamensis* and others. The incubation period is very variable, ranging from 2 weeks to several months. A variety of clinical manifestations are described, including single or multiple lesions or mucosal disease (espundia). Lesions usually occur on sun-exposed areas. Treatment is usually with pentavalent antimonial drugs.



[Q: 1054] OnExamination - Infectious disease

A 40-year-old man has had decreased mentation with confusion as well as increasing incoordination and loss of movement in his right arm over the past 6 weeks. An MRI scan shows 0.5 to 1.5 cm lesions in cerebral hemispheres in white matter and at the grey-white junction that suggest demyelination. A stereotactic biopsy is performed, and immunohistochemical staining of the tissue reveals JC papovavirus in oligodendrocytes.

Which of the following laboratory test findings is most likely to be associated with these findings?

- 1- CD4 lymphocyte count of 90/microlitre
- 2- Haemoglobin A1c of 9.8%
- 3- HDL cholesterol of 0.7 mmol/L
- 4- Oligoclonal bands in CSF
- 5- Serum sodium of 110 mmol/L

Answer & Comments

Answer: 1- CD4 lymphocyte count of 90/microlitre

The findings are those of progressive multifocal leukoencephalopathy (PML), which is a condition that can develop in immunocompromised patients, such as those with AIDS. PML is associated with papova (JC) virus infection.



[Q: 1055] OnExamination - Infectious disease

Transplacental transmission of all of the following organisms is a recognised cause of fetal malformations and disease EXCEPT:-

- 1- Cytomegalovirus
- 2- Mumps
- 3- Rubella
- 4- Toxoplasma gondii
- 5- Varicella zoster virus

Answer & Comments

Answer: 2- Mumps

Cytomegalovirus in pregnancy can cause fetal abnormalities or abortion. Varicella is rare in pregnancy but can be severe and cause intra-uterine death of the fetus. Congenital toxoplasmosis usually results from an acute maternal infection during pregnancy. Measles and mumps cause only mild maternal infection and do not pose a serious problem to the fetus.



[Q: 1056] OnExamination - Infectious disease

A 38-year-old male with a diagnosis of HIV presents with lethargy, confusion, personality change and a seizure. CT shows multiple uniformly enhancing mass lesions in both cerebral hemispheres

What treatment is indicated?

- 1- ketoconazole
- 2- pyrimethamine and sulfonamide
- 3- rifampicin and pyrazinimide
- 4- broad spectrum antibiotics
- 5- corticosteroids

Answer & Comments

Answer: 2- pyrimethamine and sulfonamide

Cerebral toxoplasma infection gives rise to multiple ring enhancing lesions on CT and MRI scanning. Multiple cerebral abscesses are commonly present, which may result in multifocal symptoms, including visual field deficits, focal seizures, aphasia, hemiparesis or hemisensory deficits, cranial nerve palsies, or cerebellar dysfunction. Nonfocal symptoms such as a confusional state or personality disorder may manifest initially, but focal symptoms eventually appear as the disease progresses.



[Q: 1057] OnExamination - Infectious disease

A 40-year-old male presents with a long history of productive cough and breathlessness. He had complained of halitosis and exacerbations of productive sputum, chest pain and haemoptysis. Examination revealed bilateral inspiratory crackles.

Which of the following treatments is likely to decrease the frequency of his exacerbations?

- 1- cyclical antibiotic therapy
- 2- inhaled corticosteroids

- 3- nebulised bronchodilators
- 4- postural drainage
- 5- surgical resection

Answer & Comments

Answer: 4- postural drainage

This man has Bronchiectasis as evidenced by his regular production of sputum associated with breathlessness, his repeated lung infections and the signs of bilateral inspiratory crackles. Retained mucus is the most important reason why bronchiectatic patients become infected. Postural drainage is therefore the cornerstone to treating bronchiectasis and should be undertaken at least once per day and more frequently during exacerbations. There have been trials looking at regular antibiotic therapy versus symptomatic treatment in patients with cystic fibrosis colonised with pseudomonas (eg Elborn JS et al. Thorax 2000;55: 355-358) but there is currently no evidence that this approach is of benefit in bronchiectasis. Similarly inhaled corticosteroids should not be used routinely in bronchiectasis until further evidence of their effect on lung function and exacerbation frequency is available. Surgical resection as a curative procedure can be performed for localised disease when underlying causes such as primary ciliary dyskinesia have been excluded. In this patient the bilateral crackles suggests widespread disease.



[Q: 1058] OnExamination - Infectious disease

A 25-year-old Turkish woman arrived in the UK with a three month history of weight loss and intermittent fevers. On examination, the patient was emaciated, febrile (39°C) and pale, and an enlarged liver (5 cm below the costal margin) and spleen (10cm below the costal margin) were present. Investigations revealed:

Haemoglobin 7.2g/dL (11.5-16.5)

White cell count $2.4 \times 10^9/L$ (4-11)

Platelet count $117 \times 10^9/L$ (150-400)

Thick and thin films no parasites identified

CXR normal

What is the most likely diagnosis?

- 1- HIV infection
- 2- Infectious mononucleosis
- 3- Malaria
- 4- Miliary tuberculosis
- 5- Visceral leishmaniasis

Answer & Comments

Answer: 5- Visceral leishmaniasis

The ethnic origin and clinical history are typical of visceral leishmaniasis. The causative agent is usually *Leishmania donovani*. Fever, malaise, weakness and weight loss are common. Hepatosplenomegaly develops gradually and may be massive. With time, the skin develops a grey colour, and gives rise to the Indian name of the disease 'kala-azar' meaning black fever. Anaemia is a common finding and may be severe.



[Q: 1059] OnExamination - Infectious disease

A 22-year-old woman is referred to hospital with a one-week history of fever, headache and fatigue. She was a 'mail order' bride who had recently moved to the UK from Thailand to live with her new husband. Based on her travel history, *which disease can be excluded from the following list of differentials?*

- 1- Cerebral toxoplasmosis
- 2- HIV seroconversion illness
- 3- Japanese B encephalitis
- 4- Tuberculosis
- 5- Yellow fever

Answer & Comments

Answer: 5- Yellow fever

Yellow fever only occurs in tropical South America and in sub-Saharan Africa. Japanese B encephalitis has a high prevalence in southeast Asia. All of the other diseases listed are widespread globally.

See also:
<http://www.cdc.gov/travel/seasia.htm>



[Q: 1060] OnExamination - Infectious disease

A 50-year-old female presents with dyspnoea, a new murmur and fever and is diagnosed with infective endocarditis.

Which of the following is associated with the best prognosis?

- 1- Aortic valve infection
- 2- Culture negative endocarditis
- 3- Low complement levels
- 4- Staphylococcus aureus infection
- 5- Streptococcus viridans infection

Answer & Comments

Answer: 5- Streptococcus viridans infection

Features suggestive of a worse prognosis are Acute endocarditis (Staphylococcus aureus), heart failure, IV drug abuse (often left and right sided disease), prosthetic valve infection, infection of the aortic rather than mitral valve, associated rhythm disturbance. Subacute bacterial endocarditis (Streptococcus viridans) has a better prognosis.



[Q: 1061] OnExamination - Infectious disease

Which of the following is a cause of isolated B-cell immune deficiency?

- 1- Infection with measles
- 2- Multiple myeloma

- 3- Treatment with azathioprine
- 4- Treatment with corticosteroids
- 5- Treatment with cyclophosphamide

Answer & Comments

Answer: 2- Multiple myeloma

Excessive production of myeloma paraprotein is associated with progressive reduction in normal immunoglobulin levels and impairment of immune function. Azathioprine, cyclophosphamide, corticosteroids and measles infection all cause reversible impairment of cell mediated immunity.



[Q: 1062] OnExamination - Infectious disease

A 27-year-old female presents with persistent fatigue, myalgia, poor concentration and irritability following a flu like illness 18 months previously. A diagnosis of chronic fatigue syndrome is made.

What is the appropriate initial management of this patient?

- 1- Antidepressants
- 2- Cognitive behavioural therapy
- 3- ECT
- 4- Reversion therapy
- 5- Psychoanalysis

Answer & Comments

Answer: 2- Cognitive behavioural therapy

In general, in order to receive a diagnosis of chronic fatigue syndrome, a patient must satisfy two criteria: 1. Have severe chronic fatigue of six months or longer duration with other known medical conditions excluded by clinical diagnosis, and 2. Concurrently have four or more of the following symptoms: substantial impairment in short-term memory or concentration, sore throat, tender lymph nodes, muscle pain, multi-joint pain without

swelling or redness, headaches of a new type, pattern or severity, unrefreshing sleep, and post-exertional malaise lasting more than 24 hours. (source CDC) There is a RCP report on CFS from 1996. Low dose antidepressants are used in the treatment of CFS, but the suggested first line therapy should include cognitive behavioural therapy, if access to this service is available.



[Q: 1063] OnExamination - Infectious disease

A 25-year-old woman presented with a history of confusion and fever that had worsened gradually over the preceding four days. On examination she was drowsy and had mild neck stiffness. Neurological examination revealed an extensor left plantar response. A CT scan of her brain showed an area of low attenuation in the right temporo-parietal region

What is the most likely diagnosis?

- 1- Cerebral toxoplasmosis
- 2- Herpes simplex encephalitis
- 3- Listeria meningoenkephalitis
- 4- Pneumococcal meningitis
- 5- Pyogenic brain abscess

Answer & Comments

Answer: 2- Herpes simplex encephalitis

Herpes simplex encephalitis (HSE) often presents subacutely over several days with declining cerebral function. The temporal or temporo-parietal regions are affected earlier and neuro-imaging usually demonstrates this. However, temporal lobe involvement is not pathognomonic of HSE. Cerebral toxoplasmosis is the result of reactivation of toxoplasmosis in severely immunocompromised individuals. Listeriosis is associated with the consumption of soft cheese and p???. Streptococcus pneumoniae causes acute pyogenic meningitis and is often

associated with suppurative otitis media or sinusitis. Brain abscesses are usually readily demonstrable by cranial CT scans.



[Q: 1064] OnExamination - Infectious disease

A 18-year-old male presents with a 6 week history of a painful swollen right knee. He had been treated for a sexually transmitted disease 3 months ago. On examination there was a large effusion in the right knee. Synovial fluid analysis revealed a white cell count of $16 \times 10^9/L$ but culture was negative.

Which one of the following organisms is the most likely cause?

- 1- Chlamydia trachomatis
- 2- Herpes simplex
- 3- Neisseria gonorrhoea
- 4- Treponema pallidum
- 5- Trichomonas vaginalis

Answer & Comments

Answer: 3- Neisseria gonorrhoea

Bacteria are the most common cause of monoarthritis. Staphylococcus aureus and gonococci are the most common causes of septic arthritis. Neisseria gonorrhoea occurs in young adults and is often preceded by a migratory tendonitis or arthritis. Gram's stain is positive in 25% and culture positive in 50%. This patient has been treated previously for a sexually acquired infection and this maybe why the culture is negative.



[Q: 1065] OnExamination - Infectious disease

An 18-year old student presented to hospital two days after returning from visiting family in India. Within twenty four hours of his return to the UK, he suddenly developed profuse watery diarrhoea. Initially he did not have any nausea, vomiting or stomach cramps, but

these developed within a day. He described the diarrhoea as looking like cloudy watery but without any blood or mucus. He was opening his bowels over 20 times per day. On examination he looked pale; he was afebrile. Skin turgor was reduced and mucous membranes were dry.

Stool culture revealed a growth of *Vibrio cholerae*.

Which is the most appropriate antibiotic to administer?

- 1- Ceftriaxone
- 2- Doxycycline
- 3- Meropenem
- 4- Metronidazole
- 5- Piperacillin plus gentamicin

Answer & Comments

Answer: 2- Doxycycline

Cholera has a short incubation period of 24-48 hours. The illness begins with the sudden onset of painless, watery diarrhoea. The diarrhea may be accompanied later by abdominal cramps, nausea and vomiting. Patients are usually afebrile. The diarrhoea is typically described as having the appearance of 'rice water' and a faintly fishy smell. The diarrhoea may be copious and result in hypovolaemic shock unless fluids are administered.

The primary aim of treatment is to restore fluid balance; antibiotics have a secondary role. However, antibiotics have been shown to reduce fluid loss and hasten clearance of the organism from the gut.

Appropriate antibiotics include tetracycline, doxycycline, ciprofloxacin, erythromycin, and co-trimoxazole. Tetracycline is usually the first-line drug of choice, although resistance is emerging in certain parts of the world.



[Q: 1066] OnExamination - Infectious disease

A 19-year-old man presented with purulent urethral discharge. Microscopy of an urethral swab showed neutrophils but no organisms

Which of the following antibiotics should be started?

- 1- Ciprofloxacin
- 2- Co-amoxiclav
- 3- Doxycycline
- 4- Metronidazole
- 5- Penicillin

Answer & Comments

Answer: 3- Doxycycline

The diagnosis is non-gonococcal urethritis (NGU). A presumptive diagnosis of gonococcal urethritis is made if gram-negative diplococci are seen within the neutrophils. Doxycycline is the drug of choice for NGU. Alternative therapies include Erythromycin, Azithromycin, Ofloxacin and Ciprofloxacin. Chlamydia trachomatis is the commonest cause of NGU accounting for 30-50% of cases. All sexual partners at risk should be assessed and offered epidemiological treatment.



[Q: 1067] OnExamination - Infectious disease

A 70-year-old man presented to his GP with a two-day history of increasing confusion. He also complained of a headache. He was febrile on examination; nuchal rigidity was noted. A lumbar puncture was performed and CSF microscopy revealed:

WBC 800 cells/mL (< 5) 90% neutrophils. A few Gram-positive diplococci were also noted.

What is the cause of his meningitis?

- 1- *Cryptococcus neoformans*
- 2- *Haemophilus influenzae*
- 3- *Listeria monocytogenes*

- 4- Neisseria meningitidis
5- Streptococcus pneumoniae

Answer & Comments

Answer: 5- Streptococcus pneumoniae

A question on Gram-staining properties of organisms causing meningitis. Pneumococcal meningitis is commoner in older patients. Neisseria meningitidis are gram negative diplococcus, whilst Haemophilus influenzae is a gram negative bacillus. Listeria monocytogenes is a cause of neonatal meningitis, and is a small gram-positive bacillus that is carried in the intestine and vagina, and may be transmitted to the neonate during the birth process. Cryptococcus neoformans is a fungus and yeast cells may be seen on microscopic examination of the CSF.



[Q: 1068] OnExamination - Infectious disease

A 36-year-old woman presents with dyspnoea, cough and fever. Crackles are heard on auscultation of the lungs. Circulating precipitans to Micropolyspora faeni are positive.

Which of the following is the most likely diagnosis?

- 1- Malt workers' lung
2- Pigeon fanciers' lung
3- Allergic Bronchopulmonary Aspergillosis
4- Brucellosis
5- Farmers' lung

Answer & Comments

Answer: 5- Farmers' lung

Spores of Micropolyspora faeni found in moldy hay/straw are responsible for Farmer's Lung.



[Q: 1069] OnExamination - Infectious disease

Reverse transcriptase-PCR is used to amplify:

- 1- Antibodies
2- DNA
3- RNA
4- Protein
5- Plasmids

Answer & Comments

Answer: 3- RNA

Reverse transcriptase PCR is a means of amplifying RNA. The RNA is transcribed into complementary DNA (cDNA) using the enzyme reverse transcriptase, the cDNA is then amplified by conventional PCR.



[Q: 1070] OnExamination - Infectious disease

A 70-year-old woman developed herpes zoster ophthalmicus.

Which one of the following is most likely to be a complication of this condition?

- 1- Hyphaema
2- Keratitis
3- Keratoconus
4- Posterior subcapsular cataract
5- Scleromalacia

Answer & Comments

Answer: 2- Keratitis

Keratitis due to VZV may subsequently lead to iridocyclitis and secondary glaucoma.



[Q: 1071] OnExamination - Infectious disease

A 18-year-old homosexual male developed progressive pneumonia not responding to antibiotics. Methenamine silver staining of the

sputum showed small circular cyst and Giemsa staining demonstrated the small, punctate nuclei of the trophozoites and intracystic sporozoite.

Which is the most likely organism?

- 1- Toxoplasma gondii
- 2- Trypanosoma cruzi
- 3- Cryptococcus neoformans
- 4- Leishmania donovani
- 5- Pneumocystis carinii

Answer & Comments

Answer: 5- Pneumocystis carinii

The organism is Pneumocystis carinii. The organism may be identified on microscopy after (a) methenamine silver staining for the cyst phase of the organism ;(b) Giemsa staining that demonstrates the small, punctate nuclei of the trophozoites and intracystic sporozoites; or (c) fluorescence-tagged monoclonal antibody.



[Q: 1072] OnExamination - Infectious disease

A 41-year-old male has been diagnosed with infective endocarditis.

Which of the following is associated with the best prognosis?

- 1- Aortic valve infection
- 2- Intravenous drug abuse
- 3- Prosthetic valve infection
- 4- Staphylococcus aureus infection
- 5- Streptococcus viridans infection

Answer & Comments

Answer: 5- Streptococcus viridans infection

Features suggestive of a worse prognosis are Acute endocarditis (Staphylococcus aureus), heart failure, IV drug abuse (often left and right sided disease), prosthetic valve infection,

infection of the aortic rather than mitral valve, associated rhythm disturbance. Subacute bacterial endocarditis (Streptococcus viridans) has a better prognosis.



[Q: 1073] OnExamination - Infectious disease

Which of the following is correct regarding human varicella zoster immunoglobulin (VZIG)?

- 1- Is used to treat severe chicken pox infection
- 2- Is recommended for all patients with eczema exposed to chickenpox.
- 3- Is invariably protective against severe varicella.
- 4- Should be given to a 6 week old baby whose mother has developed chickenpox
- 5- Should be given to an 18 week pregnant non-immune female who has been exposed to a case of chicken pox.

Answer & Comments

Answer: 5- Should be given to an 18 week pregnant non-immune female who has been exposed to a case of chicken pox.

Answer: 5) Should be given to an 18 week pregnant non-immune female who has been exposed to a case of chicken pox.

Varicella has a secondary infection rate in household contacts of 90%. It is commonest in spring time, and the incubation period is 14-21 days. It shares the herpes virus family properties of latency and reactivation (zoster). Risks to the fetus and neonate relate to the time of infection:

" Less than 20 weeks pregnancy: congenital varicella (limb hypoplasia, microcephaly, cataracts, growth retardation, skin scarring). High mortality.

" Second to third trimester: herpes zoster in an otherwise healthy infant.

" Minus 7 days to plus 7 days after delivery: severe and even fatal disease (30% mortality). Although a live attenuated vaccine is available, it is not licensed for use in the UK.

Varicella zoster immunoglobulin is prepared from pooled plasma of UK blood donors with a history of recent chickenpox or herpes zoster. Being an immunoglobulin, it is a protein concentrate, and should be stored between 2 and 8°C. Donors are screened for HIV, hepatitis B and hepatitis C. VZIG prophylaxis is recommended for patients who fulfil all the following criteria:

" A clinical condition that increases the risk of severe varicella, (e.g. immunosuppression, neonates, pregnant women).

" No antibodies to varicella zoster.

" Significant exposure to chickenpox or herpes.

Severe or fatal varicella can occur despite VZIG prophylaxis. Active immunisation should therefore be used for susceptible immunosuppressed patients at long term risk. Clinical chickenpox occurs in 50% of those who receive VZIG prophylaxis, and 10% more will be affected sub-clinically.



[Q: 1074] OnExamination - Infectious disease

Which of the following is a contraindication to immunisation?

- 1- Infantile eczema requiring topical steroids.
- 2- Oral poliomyelitis vaccine to a child on oral steroids.
- 3- A history of prolonged jaundice.
- 4- A child with congenital adrenal hyperplasia on oral cortisone.
- 5- A child with cerebral palsy.

Answer & Comments

Answer: 2- Oral poliomyelitis vaccine to a child on oral steroids.

Answer: 2) Oral poliomyelitis vaccine to a child on oral steroids.

Common misconceptions regarding immunisations include:

" A family history of adverse reaction, or a previous history of pertussis, measles, rubella or mumps infection.

" Prematurity or low birth weight.

" Stable neurological conditions such as cerebral palsy or Down's Syndrome.

" Asthma, eczema, hayfever or snuffles.

" Contact with an infectious disease, or treatment with antibiotics or topical steroids.

" Pregnant mother or a mother who is breast feeding.

" Prolonged jaundice.

" Patients on replacement corticosteroids.

Oral polio vaccine should not be given to immunosuppressed children, their siblings or household contacts. In children with HIV, there is little evidence that they themselves will have problems, but excretion may be prolonged, and this may give rise to an increased risk of infection of HIV positive household contacts.



[Q: 1075] OnExamination - Infectious disease

The morphological appearance of Pneumocystis carinii infection in the lung is best characterised as which one of the following?

- 1- A bronchopneumonia with abscess formation
- 2- A haemorrhagic and necrotizing pneumonia

- 3- An acute respiratory distress syndrome (ARDS) with widespread hyaline membrane formation
- 4- An interstitial pneumonitis with foamy intra-alveolar exudate
- 5- An organizing bronchopneumonia

Answer & Comments

Answer: 4- An interstitial pneumonitis with foamy intra-alveolar exudate

Pneumocystis carinii is a fungal organism. In PC pneumonia, the organism is confined to the alveolar space of the lung and produce debris and cysts in the alveolar space with interstitial infiltration of lymphocytes and plasma cells. As a result, it can cause profound disturbance of oxygen exchange and fatal hypoxaemia if left untreated.



[Q: 1076] OnExamination - Infectious disease

An 85-year-old patient from an elderly care home, experiences sudden onset of dyspnea and palpitations. A pulmonary ventilation-perfusion scan is performed and indicates a high probability for a perfusion defect involving a pulmonary arterial branch.

Which of the following findings or conditions is the one that is the most important factor favouring development of her complaint?

- 1- A neutrophilia
- 2- An increased platelet count
- 3- Cirrhosis of the liver
- 4- Generalized atherosclerosis
- 5- Poor nutrition

Answer & Comments

Answer: 2- An increased platelet count

This would lead to a prothrombotic state, increasing the risk of pulmonary embolism. Cirrhosis, and possibly poor nutrition, would

lead to decreased production of coagulation factors thus prolonging the INR. A neutrophilia would suggest infection leading to ventilation defect, and not a perfusion defect. Atherosclerosis would pre-dispose to arterial thrombo-embolus.



[Q: 1077] OnExamination - Infectious disease

A 30-year-old renal transplant recipient presented with non-Hodgkin's lymphoma.

Which virus is most likely to be of aetiological significance?

- 1- Adenovirus
- 2- Cytomegalovirus
- 3- Epstein Barr virus
- 4- Herpes simplex type 1
- 5- Varicella-zoster

Answer & Comments

Answer: 3- Epstein Barr virus

EBV-associated lymphoproliferative disease may occur in individuals with inherited or acquired immunodeficiency syndromes. Approximately 1% of renal transplant recipients develop post-transplant lymphoproliferative disease (PTLD) in the first year following their transplant.



[Q: 1078] OnExamination - Infectious disease

Regarding the epidemiology of infections, which of the following statements is true?

- 1- Resistant vivax malaria is a major problem in Kenya.
- 2- Diphtheria has been eradicated in most parts of the world.
- 3- Polio has been eradicated in most parts of the world.
- 4- Tetanus has been eradicated in most parts of the world.

5- The AIDS epidemic seems to be declining worldwide.

Answer & Comments

Answer: 3- Polio has been eradicated in most parts of the world.

Answer: 3) Polio has been eradicated in most parts of the world.

Falciparum is the major resistance problem in sub-Saharan Africa. Most vivax is Chloroquine sensitive, though resistant strains are appearing in New Guinea and Indonesia. Diphtheria is still prevalent in many parts of the world. An upsurge in polio is now nearing eradication. Tetanus is still common. AIDS is increasing inexorably.



[Q: 1079] OnExamination - Infectious disease

A 45-year-old man returned from a two-week trip in Zimbabwe. Fourteen days later he presented with fever, sore throat, headaches and a widespread maculopapular rash. On examination there was generalised lymphadenopathy and a widespread maculopapular rash.

What is the most likely diagnosis?

- 1- acute HIV infection
- 2- schistosomiasis
- 3- strongyloidiasis
- 4- tick typhus
- 5- typhoid fever

Answer & Comments

Answer: 1- acute HIV infection

It is essential to exclude acute HIV in this case. Acute retroviral syndrome is said to occur in 60-80% of patients between 2 and 12 weeks following exposure to HIV. Typical symptoms include fever, pharyngitis, lymphadenopathy and a widespread macular rash. The illness

closely resembles infectious mononucleosis. During seroconversion it is likely that the HIV antibody test will be negative; the diagnosis is made by PCR of peripheral blood for HIV RNA; in acute HIV the viral load is very high.

"The time from exposure to onset of symptoms is usually 2-4 weeks, but the incubation may be as long as 10 months in rare cases (N Engl J Med 1998;339:33; N Engl J Med 1997;336:919). Typical symptoms in a review of 209 cases (J Infect Dis 1994;168:1490) included fever (96%), adenopathy (74%), pharyngitis (70%), rash" more ...

"This particular patient clearly exemplifies the classic presentation of acute primary infection"



[Q: 1080] OnExamination - Infectious disease

A 17 year-old man presented with a strongly positive Mantoux test.

Which one of the following statements regarding his immune reaction is correct?

- 1- It is a cell mediated immune response
- 2- The response is mediated by B lymphocytes
- 3- The area of induration will be less than 10 mm in diameter
- 4- The reaction typically develops within 24 hours
- 5- If a skin biopsy were taken, immunohistochemistry would show immune complex deposition

Answer & Comments

Answer: 1- It is a cell mediated immune response

The tuberculin skin test (TST) is an intradermal test for cell-mediated hypersensitivity to tuberculo-protein. A strongly positive Mantoux is an area of induration of >15mm (10 tuberculin units). The test is negative in those

who have never been exposed to infection with TB. It usually becomes positive 3-5 weeks after infection. False-negative TST are seen in debilitated and immune-deficient patients.



[Q: 1081] OnExamination - Infectious disease

Which of the following concerning IgG is correct?

- 1- It has a molecular weight of 50,000 kd.
- 2- It is monovalent.
- 3- It comprises the majority of circulating antibody in serum.
- 4- It differs from other isotypes in not being able to cross the placental barrier.
- 5- It is the major antibody produced during the primary response.

Answer & Comments

Answer: 3- It comprises the majority of circulating antibody in serum.

Answer: 3) It comprises the majority of circulating antibody in serum.

- a) Each light chain has a MW of 25,000 and each H chain a MW of 50,000. Therefore, since the whole molecule consists of 2 L and 2 H chains, the MW is 150,000 kd.
- b) It exists as a monomer with 2 Fab portions, each of which can interact with an antigenic determinant. Therefore it is divalent.
- c) Normal range 8-19 g/l. Next is IgA, 1-5 g/l, followed by IgM 0.5- 2 g/l.
- d) It is in fact the only antibody capable of crossing the placental barrier, which it does through gaining attachment via its Fc portion.
- e) It is the major antibody produced in the secondary immune response. IgM is the major antibody produced during the primary response.



[Q: 1082] OnExamination - Infectious disease

A 75-year-old female presents with an acute infective exacerbation of her long standing Chronic Obstructive Airways Disease. Blood gas analysis whilst she was receiving Oxygen shows:

pH 7.14
pO₂ 18 kPa (11.3-12.5)
pCO₂ 10.5 kPa (4.7-6.0)

What is the most appropriate immediate management for this patient?

- 1- CPAP
- 2- Doxapram infusion
- 3- Invasive Ventilation
- 4- nebulised salbutamol with ipratropium
- 5- reduce inspired oxygen concentration

Answer & Comments

Answer: 5- reduce inspired oxygen concentration

This patient's blood gases show she is receiving too high a concentration of oxygen which is likely to have precipitated her hypercapnic acidosis. Patients with COPD should not in general receive more than 24-28% oxygen without arterial blood gas monitoring. Reduction of FiO₂ may be sufficient to improve this lady's acidosis. Once this is done she should be treated with nebulised B/D driven on air and if she fails to improve despite controlled oxygen and bronchodilators NIV is indicated.



[Q: 1083] OnExamination - Infectious disease

A 15-year-old boy is referred by his GP with a two-week history of general malaise, fatigue and pharyngitis. On examination, multiple small lymph nodes were palpable in the neck, axillae and groins. Investigations revealed:

Haemoglobin 12.5g/dL
 WBC $16.0 \times 10^9/L$
 Platelets $160 \times 10^9/L$
 Blood film Lymphocytosis noted

What is the most likely diagnosis?

- 1- Acute lymphoblastic leukaemia
- 2- Cytomegalovirus infection
- 3- Epstein-Barr virus infection
- 4- Hodgkin's disease
- 5- Toxoplasmosis

Answer & Comments

Answer: 3- Epstein-Barr virus infection

Acute EBV typically presents with a history of 1-2 weeks of fatigue and malaise, fever, pharyngitis, and symmetrical, bilateral lymphadenopathy. Heterophil antibody tests are usually positive. Mild transient thrombocytopenia is not uncommon in EBV infectious mononucleosis. CMV mononucleosis has a lower incidence of pharyngitis and cervical adenopathy. Primary Toxoplasmosis is acquired via ingestion of undercooked meat containing toxoplasma cysts or ingestion of fresh food contaminated by toxoplasma excreted in cats' feces. The infection is asymptomatic in 80-90% of immunocompetent patients. Highly characteristic of toxoplasmosis is asymmetrical lymphadenopathy limited to an isolated lymph node group. Patients with toxoplasmosis have little or no fever, fatigue, or pharyngitis. CMV infectious mononucleosis may be indistinguishable in clinical presentation from EBV but is usually not accompanied by posterior cervical adenopathy; non-exudative pharyngitis is minimal or absent. The diagnosis of ALL and HD is made by a combination of blood film examination, bone marrow aspiration and biopsy and lymph node biopsy.



[Q: 1084] OnExamination - Infectious disease

A 38-year-old woman is referred to casualty with bilateral weakness in her legs. She also complains of general malaise. Three weeks previously she had returned from a four-week tour of Eastern Europe. On examination she appeared unwell and was pyrexial (38.9°C). She has large palpable cervical lymph nodes bilaterally. Her pharynx was inflamed with areas of exudate on the pharyngeal wall. Neurological examination revealed global weakness of both legs and absent reflexes.

What is the most likely diagnosis?

- 1- Cytomegalovirus infection
- 2- Diphtheria
- 3- Epstein-Barr virus infection
- 4- Hodgkin's disease
- 5- Streptococcal tonsillitis

Answer & Comments

Answer: 2- Diphtheria

The break down of healthcare services in the former USSR was associated with a major resurgence of diphtheria. Pharyngeal diphtheria presents with fever, sore throat, cervical lymphadenopathy and an adherent, grayish pharyngeal membrane. The diphtheria toxin causes cardio- and neurotoxicity. Treatment consists of antibiotic therapy and diphtheria antitoxin.



[Q: 1085] OnExamination - Infectious disease

*Which of the following would be indicated in the treatment of a 30-year-old HIV positive male with *Pneumocystis carinii* pneumonia? Blood gases reveal a P_{O_2} of 55mmHg whilst breathing 28% oxygen.*

- 1- Atovaquone
- 2- Clindamycin
- 3- Leucovorin

4- Pentamidine

5- Trimethoprim-sulphamethoxazole

Answer & Comments

Answer: 5- Trimethoprim-sulphamethoxazole

This patient has severe PCP as suggested by the hypoxia (pO₂ less than 70). He should be treated with high percentage oxygen and the drug of choice is high dose IV cotrimoxazole (trimethoprim-sulphamethoxazole). If allergic to co-trimoxazole, IV pentamidine or Clindamycin are appropriate. IV leucovirin and oral atovaquone are further options but are not first line therapies. Prednisolone has been shown to reduce mortality substantially in patients with a PO₂ < 60mmHg.



[Q: 1086] OnExamination - Infectious disease

A 70-year-old lady presented with dyspnoea and fever. She has a history of weight loss which has been investigated with colonoscopy which found a tumour of the sigmoid colon and she is awaiting surgery. On examination she has a systolic murmur and and ECHO shows vegetations on the mitral valve. A diagnosis of infective endocarditis is made.

Which of the following organisms is associated with a high incidence of colorectal tumours?

- 1- Campylobacter jejuni
- 2- Enterococcus faecalis
- 3- Escherichia coli
- 4- Salmonella typhi
- 5- Streptococcus bovis

Answer & Comments

Answer: 5- Streptococcus bovis

Up to half of patients presenting with Streptococcus bovis endocarditis have colorectal tumours.



[Q: 1087] OnExamination - Infectious disease

A 25-year-old-man presented with severe headache, myalgia and a blanching red macular rash. He had returned from Indonesia three days previously. On examination his blood pressure was 75/50 mmHg. A diagnosis of dengue fever was made.

Which of the following would be given immediately?

- 1- A single dose of ivermectin
- 2- Intravenous hydrocortisone 200 mg
- 3- Intravenous normal saline
- 4- Metronidazole
- 5- Tetracycline

Answer & Comments

Answer: 3- Intravenous normal saline

Dengue is transmitted by Aedes aegyti mosquito in endemic areas. There are 4 serotypes. Re-infection with a different serotype aggravates the infection and is associated with serious complications such as dengue haemorrhagic fever (DHF) and dengue shock syndrome (DSS). Treatment is supportive with fluid replacement, blood transfusion and correction of clotting. Corticosteroids have no role.

In the first few days the rash is macular, blanching and transient. The second rash which looks like measles and is morbilliform, maculopapular, sparing palms and soles.

Don't confuse Dengue fever with Dengue hemorrhagic fever.



[Q: 1088] OnExamination - Infectious disease

Toxoplasmosis

- 1- can present with fits in patients with AIDS
- 2- infection in the first trimester of pregnancy is seldom harmful to fetus

- 3- raw eggs are an important source of infection
- 4- infection usually by respiration
- 5- prophylactic immunoglobulins should be given to pregnant women if their IgM anti-toxoplasma antibodies detected.

Answer & Comments

Answer: 1- can present with fits in patients with AIDS

Transmission of *Toxoplasma gondii* after ingestion of cysts from contact with cat faeces or raw / undercooked meat. Definitive host is the cat. Oocysts excreted with cat faeces can remain in soil for months. Risk of fetopathy reduced by > 50% if spiramycin given to mothers, which can prevent maternal-fetal transmission.



[Q: 1089] OnExamination - Infectious disease

A 52-year-old woman was admitted with malaise and leg weakness. Her illness started with a sore throat while travelling in Eastern Europe. On examination she was febrile (39.1°C) with several areas of exudates on her pharynx and extensive cervical lymphadenopathy. There was weakness of the legs with absent tendon reflexes.

What is the most likely diagnosis?

- 1- Acute myeloid leukaemia
- 2- Cytomegalovirus infection
- 3- Diphtheria
- 4- Glandular fever
- 5- Streptococcal tonsillitis

Answer & Comments

Answer: 3- Diphtheria

This history of severe exudative pharyngitis in a person who has recently travelled to eastern Europe is highly suggestive of diphtheria. The

disease, caused by *Corynebacterium diphtheriae*, causes a severe pharyngitis with extensive soft tissue swelling and lymphadenitis that produces a characteristic 'bull neck' appearance. Exotoxins produced by the organism may cause myocarditis or neurological defects. The degree of neurological toxicity varies, but may be severe, causing cranial neuropathies, predominantly motor peripheral neuropathy (occasionally sensory neuropathy). An epidemic of diphtheria began in Russia in the early 1990s and remains a significant public health problem in Russia and in the former Soviet states.



[Q: 1090] OnExamination - Infectious disease

*Regarding pneumonia caused by *Legionella pneumophila*, which of the following is true?*

- 1- is associated with hyponatremia
- 2- is best treated with intravenous amoxicillin and clavulanic acid
- 3- is common in AIDS patients
- 4- is readily diagnosed by standard aerobic culture of sputum
- 5- should be managed on the ward in a respiratory isolation cubicle

Answer & Comments

Answer: 1- is associated with hyponatremia

Legionella pneumophila is a Gram-negative bacillus that is ubiquitous in the environment. Human infection occurs when a sufficient inoculum of bacteria are aerosolised and inhaled. A variety of environmental sources have been identified as reservoirs of *Legionella* and have been responsible for infection in humans, including air conditioners, humidifiers, shower units and jacuzzis. *Legionellae* do not grow on standard culture media, but require specific supplemented media; they grow best at a low pH. *Legionella*

pneumonia is commoner in men than women (3:1). Other factors that predispose to infection include smoking, alcoholism, old age, chronic illness, immunosuppressive therapy. Legionella is not common in AIDS, though patients with advanced disease will be at increased risk. Erythromycin or clarithromycin are the antibiotics of choice; alternatives include doxycycline, co-trimoxazole or ciprofloxacin.

More:

<http://www.emedicine.com/med/topic1273.htm>



[Q: 1091] OnExamination - Infectious disease

A 17-year-old male from India presents with fever of 4 months duration and splenomegaly.

What is the most likely diagnosis?

- 1- Coccidiomycosis
- 2- Giardiasis
- 3- Tropical sprue
- 4- Typhoid
- 5- Visceral leishmaniasis

Answer & Comments

Answer: 5- Visceral leishmaniasis

Visceral leishmaniasis (Kala-azar) is an endemic disease in several regions of India and sub-Saharan Africa. It is caused by the parasite *Leishmania donovani* and spread by *Phlebotomus* sand-flies. Leishmaniasis is common in immune-suppressed patients, particularly those infected with HIV. There has recently been a substantial increase of cases in the Mediterranean region. It has been estimated that 15% of HIV positive drug users in Spain are infected with *Leishmania donovani* infantum. Giardiasis and tropical sprue present with gastrointestinal symptoms and malabsorption. Typhoid is an acute illness.

Coccidiomycosis is largely confined to the Americas. Most patients present with pulmonary symptoms although disseminated disease can occur particularly in the immune-suppressed.



[Q: 1092] OnExamination - Infectious disease

A 70-year-old man is admitted to the cardiology ward with a diagnosis of *Streptococcus bovis* infective endocarditis.

Which of the following investigations would be indicated?

- 1- Colonoscopy
- 2- Cystoscopy
- 3- Lymph node biopsy
- 4- Sialogram
- 5- Thoracoscopy

Answer & Comments

Answer: 1- Colonoscopy

The association between *Streptococcus bovis* bacteremia and colonic neoplasia is well described. (Arch Surg. 2004;139:760-765). The consensus of opinion is that all subjects should undergo evaluation including investigation of the GI tract. If investigation is clear then further tests should only be performed where there are symptoms or signs to suggest malignancy in other areas.



[Q: 1093] OnExamination - Infectious disease

A 43-year-old man has had vague malaise for three weeks. Physical examination is normal, except for a blood pressure of 150/95 mmHg and pitting oedema of the legs to the knees. Dipstick urinalysis shows no glucose, blood, ketones, nitrite, or urobilinogen, and the microscopic urinalysis reveals no RBC/hpf and only 1 WBC/hpf. Additional laboratory testing reveals a 24 hour urine protein of 4.1 gm. His

serum creatinine is 350 micromol/L with urea of 30 mmol/L. His hepatitis B surface antigen is positive.

Which of the following conditions is he most likely to have?

- 1- Membranous glomerulonephritis
- 2- Systemic lupus erythematosus
- 3- Acute tubular necrosis
- 4- Diabetic nephropathy
- 5- Post-streptococcal glomerulonephritis

Answer & Comments

Answer: 1- Membranous glomerulonephritis

Membranous glomerulonephritis is an antibody mediated disease in which the immune complexes localize to the subepithelial aspect of the capillary loop. That is, between the outer aspect of the basement membrane and the podocyte (epithelial cell).

The immune complexes develop in situ or, less likely, by the deposition of circulating immune complexes. The antibody may bind to an intrinsic glomerular antigen or to an exogenous antigen planted on the capillary wall.

Approximately 25 to 30% of cases are secondary. Common associations include:

- " Systemic lupus erythematosus and other connective tissue disorders
- " Drugs (gold, penicillamine, non-steroidal anti-inflammatory agents)
- " Hepatitis B, syphilis, quartan malaria, leprosy, schistosomiasis
- " Carcinoma, melanoma, leukemia, non-Hodgkin's lymphomas.

Membranous glomerulonephritis is more common in adults and most patients are older than 30 years at diagnosis. Membranous glomerulonephritis accounts for 35-50% of cases of adult nephrotic syndrome. Most

patients present with heavy proteinuria, most commonly in the nephrotic range, that is insidious in onset. A few patients have accompanying microscopic hematuria.



[Q: 1094] OnExamination - Infectious disease

Which of the following is true of Koplik's spots?

- 1- Are diagnostic of Measles
- 2- Located opposite the incisor teeth.
- 3- Only appear when fever is over 39C
- 4- They appear as red papules on the palmar surface of the hands
- 5- Typically appear two days after the rash.

Answer & Comments

Answer: 1- Are diagnostic of Measles

Koplik's spots are small, irregular, bright red spots with blue-white centres, occurring on the inside of the cheek next to the premolars. Seen only in measles they are diagnostic. The spots usually occur briefly after the fever begins and a couple of days before the generalized rash appears. Not infrequently, the spots disappear as the eruption develops.



[Q: 1095] OnExamination - Infectious disease

A 43-year-old woman develops a progressive, ascending motor weakness over several days. She is hospitalized and requires intubation with mechanical ventilation. She is afebrile. A lumbar puncture is performed with normal opening pressure and yields clear, colorless CSF with normal glucose, increased protein, and cell count of 5/microliter, all lymphocytes. She gradually recovers over the next month.

Which of the following conditions most likely preceded the onset of her illness?

- 1- Ketoacidosis
- 2- Staphylococcus aureus septicemia

- 3- Systemic lupus erythematosus
- 4- Viral pneumonia
- 5- Vitamin B₁₂ deficiency

Answer & Comments

Answer: 4- Viral pneumonia

She has Guillain-Barre syndrome often preceded by an episode of infection such as viral (CMV) or bacterial (Campylobacter).



[Q: 1096] OnExamination - Infectious disease

A 49-year-old man with a long history of alcoholism presents with cough, haemoptysis and pleuritic chest pain. He has had night sweats and 10 kg weight loss in the last three months. On chest X-ray there is a subtle nodular pattern throughout the lung.

He underwent a transbronchial biopsy which showed multinucleated giant cells, epithelioid cells and necrotic debris.

Which of the following is the most likely diagnosis?

- 1- Aspergillosis
- 2- Pneumocystis carinii pneumonia
- 3- Small cell carcinoma
- 4- Squamous cell carcinoma
- 5- Tuberculosis

Answer & Comments

Answer: 5- Tuberculosis

The history, in itself, of night sweats, haemoptysis and the miliary shadowing in an alcoholic is highly suggestive of TB. The giant cells, part of granulomas would again be supportive of TB.



[Q: 1097] OnExamination - Infectious disease

A 42-year-old man with advanced HIV disease

presented with a tonic-clonic seizure. He had been diagnosed with HIV 10 years previously, but had elected not to take antiretroviral therapy. A CT scan of his brain showed a 2 cm ring-enhancing lesion in the right parietal lobe.

What is the probable causative agent?

- 1- Cryptococcus neoformans
- 2- Mycobacterium avium intracellulare
- 3- Mycobacterium tuberculosis
- 4- Pneumocystis carinii
- 5- Toxoplasma gondii

Answer & Comments

Answer: 5- Toxoplasma gondii

This is a typical presentation with AIDS-related cerebral toxoplasmosis. The differential diagnosis of ring-enhancing lesions on CT in a patient with AIDS include (1) Cerebral toxoplasmosis (2) abscesses (3) metastases (4) atypical CNS lymphoma. Cryptococcus typically causes a meningitis. CNS infections with the remaining organisms are rare in AIDS.



[Q: 1098] OnExamination - Infectious disease

One of the surgical wards in your hospital notes an outbreak of Methicillin-resistant Staphylococcus aureus (MRSA) infections.

What is the best mechanism for reducing further transmission of this infection?

- 1- Cleaning the floors and walls of the ward with chlorhexidine
- 2- Close the ward for one month
- 3- Encourage regular hand washing by ward staff
- 4- Screen ward staff using nasal swabs and exclude those with positive cultures for MRSA
- 5- Treatment of culture-positive patients with vancomycin

Answer & Comments

Answer: 3- Encourage regular hand washing by ward staff

Cross-infection via hands of medical and nursing staff is a very important vehicle of transmission of MRSA. Hand washing before and after contact with patients is the single most effective measure to control hospital spread of this organism. Screening of ward staff is appropriate only in certain situations and should not be carried out unless recommended by the hospital infection control team. Vancomycin should never be used for MRSA decolonization. The hospital infection control policy should outline which patients should be screened and when decolonization should be attempted.



[Q: 1099] OnExamination - Infectious disease

In herpes simplex encephalitis which of the following statements is correct?

- 1- brain MRI is characteristically normal
- 2- temporal lobe involvement is common
- 3- fits are uncommon
- 4- cold sores or genital herpes are usually present
- 5- viral identification by PCR on cerebrospinal fluid is non-specific

Answer & Comments

Answer: 2- temporal lobe involvement is common

MRI brain normally shows changes in the temporal lobes. Presenting features include fever, headache, vomiting, reduced consciousness and seizures. There may be dysphasia, hallucinations and peculiar behaviour. There are usually no skin manifestations of herpes simplex infections. The virus is rarely isolated from CSF but may be detected by PMR.



[Q: 1100] OnExamination - Infectious disease

A 55-year-old female is admitted with a chest infection. Investigations reveal consolidation in the right base on the chest X-ray and urinary legionella antigen is found to be positive.

Which one of the following is the most appropriate treatment for this woman?

- 1- Cefotaxime
- 2- Clarithromycin
- 3- Co-Amoxiclav
- 4- Minocycline
- 5- Vancomycin

Answer & Comments

Answer: 2- Clarithromycin

The most appropriate treatment for Legionellosis is clarithromycin. Ciprofloxacin is also a useful drug in combination with clarithromycin for severe infections or alone in those intolerant of macrolides.



[Q: 1101] OnExamination - Infectious disease

A 44-year-old man with advanced HIV/AIDS presents with a two-week history of fever, weight loss (8kg) and sweats. His latest CD4 T-lymphocyte count (taken four weeks previously) was 20 cells/mm³. He had failed multiple regimens of antiretroviral therapy and was not currently taking any prescribed medications other than co-trimoxazole as prophylaxis against *Pneumocystis carinii* pneumonia.

Investigations:

Hb 8.2 g/dL

WBC (total) $2.1 \times 10^9/L$

Platelets $75 \times 10^9/L$

A bone marrow aspirate showed acid/alcohol fast bacilli on light microscopy.

Which one of the following mycobacteria is the most likely cause of his presenting illness?

- 1- Mycobacterium avium
- 2- Mycobacterium bovis
- 3- Mycobacterium chelonae
- 4- Mycobacterium fortuitum
- 5- Mycobacterium marinum

Answer & Comments

Answer: 1- Mycobacterium avium

Mycobacterium bovis and Mycobacterium tuberculosis are classified as 'typical' mycobacteria that cause a similar spectrum of disease. As its name suggests, M. bovis also causes disease in cattle and the usual source of human infection was from drinking contaminated milk; this is now rare. BCG is a live attenuated vaccine derived from a strain of M. bovis. BCG is currently used as a form of immunotherapy for treating bladder cancer; several cases of disseminated M. bovis infection (systemic 'BCG-it is') have been described as a result of systemic infection following this treatment.

The other organisms listed are non-tuberculous mycobacteria (NTM); sometimes referred to as 'atypical' mycobacteria. They differ from M. tuberculosis in that they are ubiquitous organisms and have no person-to-person spread.

Mycobacterium avium (also known as Mycobacterium avium complex (MAC), or Mycobacterium avium intracellulare (MAI)) causes disseminated infection in patients with advanced HIV, typically when the CD4 count is less than 50 cells/mm³. This is a disseminated infection that usually causes symptoms of fatigue, weight loss and fevers. Bone marrow infiltration is typical and patients are often anaemic and/or pancytopenic. The diagnosis is best made from bone marrow aspiration and culture. It may also be detected in blood cultures.

M. fortuitum, and M. chelonae typically present as painful papular, nodular or ulcerating skin lesions. Both are classified as a rapidly growing mycobacteria and infect immunocompetent individuals. It is a natural environmental organism that has been found in water sources, sewage and dirt. Other manifestations include osteomyelitis, lymphadenitis, and ocular disease (keratitis and corneal ulceration), usually a result of wound contamination after trauma.

Disseminated disease may be seen in immunosuppressed patients.

Mycobacterium marinum infection occurs when contaminated water is exposed to skin that has experienced open trauma. It is an uncommon infection that is usually seen in patients who handle fish or swim in freshwater or saltwater. The skin is the most common site of infection, where it usually produces a solitary indolent granulomatous lesion, the 'fish tank granuloma'.



[Q: 1102] OnExamination - Infectious disease

A 17-year-old man presented with a widespread maculopapular rash. He had been prescribed Amoxicillin for exudative tonsillitis.

What is the most likely diagnosis?

- 1- acute HIV infection
- 2- cytomegalovirus infection
- 3- infectious mononucleosis
- 4- parvovirus infection
- 5- streptococcal infection

Answer & Comments

Answer: 3- infectious mononucleosis

This patient has the typical features of glandular fever and is confirmed by the typical rash following the introduction of amoxicillin. This rash is considered almost pathognomonic of glandular fever and will subside following

withdrawal of amoxicillin. There are no other features in this patients history to suggest an alternative diagnosis.



[Q: 1103] OnExamination - Infectious disease

Which of the following micro-organisms is generally sensitive to Benzylpenicillin?

- 1- Bordetella pertussis
- 2- Cryptococcus neoformans
- 3- Mycoplasma pneumoniae
- 4- Legionella pneumophila
- 5- Streptococcus Pneumoniae

Answer & Comments

Answer: 5- Streptococcus Pneumoniae

Penicillin binds to specific penicillin-binding proteins (PBP's) in the cell wall, mainly of gram positive organisms. Penicillin resistance is usually due to production of altered PBPs or beta-lactamases which leave the ... Penicillin is mainly useful for Group A Strep., Group B Strep., meningococcal and pneumococcal infections, though anthrax are also sensitive. Pneumococci with modified PBPs are an increasing problem.



[Q: 1104] OnExamination - Infectious disease

A 60-year-old man was admitted with community-acquired pneumonia and deteriorated over the next few hours.

Which one of the following indicates a poor prognosis?

- 1- A total white cell count of $17 \times 10^9/L$ (4-11)
- 2- Blood pressure of 110/70 mm Hg
- 3- Respiratory rate of 35 breaths/min
- 4- Rigors
- 5- Temperature of 39°C

Answer & Comments

Answer: 3- Respiratory rate of 35 breaths/min

The presence of raised urea ($>7\text{mM}$), hypotension (diastolic BP equal or $<60\text{mmHg}$) and respiratory rate equal or $> 30/\text{min}$ is associated with significantly increased risk of death. Other less important features of severe pneumonia include older age (>60), comorbidity, confusion, cyanosis, WBC <4000 or > 30000 , hypoxia and CXR with multilobe involvement.



[Q: 1105] OnExamination - Infectious disease

A 15 year-old girl presented with a 12-hour history of fever and global headache. On examination she was febrile (37.5°C). She was fully conscious. Mild neck stiffness was noted but there were no other neurological signs. Cerebrospinal fluid analysis showed:

Cell count $200/\text{mL}$ (60% lymphocytes)

Protein 0.8 g/L

Glucose 4.3 mmol/L

Gram stain

No organisms seen

What is the most likely diagnosis?

- 1- Bacterial meningitis
- 2- Cryptococcal meningitis
- 3- Lymphomatous meningitis
- 4- Tuberculous meningitis
- 5- Viral meningitis

Answer & Comments

Answer: 5- Viral meningitis

Enteroviruses and mumps are the commonest causes of viral meningitis. CSF changes with bacterial meningitis typically include high protein, low glucose and neutrophil pleocytosis. Cryptococcal meningitis is an infection of severely immunocompromised

individuals, especially advanced HIV infection. Tuberculous meningitis is an insidious illness, presenting over weeks and months.



[Q: 1106] OnExamination - Infectious disease

Three elderly patients presented with cough, fever and general malaise on return from holiday to Spain. The group of 50 had travelled together visiting forestry on the hills together with fishing trips in mountain streams. They had been housed in differing hotels. The three people who presented with illness all stayed in the same hotel.

Which of the following organisms is most likely to be responsible for their illness?

- 1- Borelia Burgdorferi
- 2- Legionella pneumophila
- 3- Leptospira icterohaemorrhagica
- 4- Mycoplasma pneumoniae
- 5- Pneumococcus

Answer & Comments

Answer: 2- Legionella pneumophila

This is a typical story for legionnaire's disease caused by Legionella pneumophila. The condition was described first in a veteran's legion conference in a similar fashion to the above description. Contaminated air conditioning units are often to blame. Weil's disease is unlikely given the story as is Lyme disease (Borelia burgdorferi).



[Q: 1107] OnExamination - Infectious disease

One of the nurses working on the Care of the Elderly ward sustains a needlestick injury while taking blood from a patient.

What is the most appropriate immediate management?

- 1- Administer prophylactic hepatitis B immunoglobulin regardless of vaccine status
- 2- Exclude the nurse from performing exposure-prone procedures for three months until a negative HIV antibody test has been obtained
- 3- Immediately take the nurse's blood to test for antibodies to hepatitis B, hepatitis C and human immunodeficiency viruses
- 4- Promptly administration of antiretroviral therapy
- 5- Wash the wound with soap under running water

Answer & Comments

Answer: 5- Wash the wound with soap under running water

The first line of management of needlestick injuries includes immediate washing under running water. All incidents should be reported to occupational health department and have a careful risk assessment. HBIG is given only if donor is known Hepatitis B positive and victim is non-immune. Antiretroviral therapy is given, after counseling, if donor is known HIV positive and the exposure is deemed high risk.



[Q: 1108] OnExamination - Infectious disease

A 45-year-old woman was diagnosed with bacterial endocarditis.

What is the characteristic fundoscopic feature of this disease?

- 1- Cherry red macula
- 2- Janeway lesions
- 3- Macular star
- 4- Retinal artery aneurysms
- 5- Roth's spots

Answer & Comments

Answer: 5- Roth's spots

Roth's spots are the fundoscopic hallmark of bacterial endocarditis. Other features include Osler's nodes (tender subcutaneous nodules caused by immune complex deposition), and Janeway lesions (caused by infective emboli in the skin).



[Q: 1109] OnExamination - Infectious disease

Primary Pulmonary tuberculosis:

- 1- Leads to pleural effusion
- 2- Is highly infective
- 3- Commonly leads to miliary TB
- 4- May be totally asymptomatic
- 5- Usually produces cavitation

Answer & Comments

Answer: 4- May be totally asymptomatic

Primary Pulmonary tuberculosis is often asymptomatic consisting of primary complex. Cavitation and pleural effusions are a manifestations of post primary TB.



[Q: 1110] OnExamination - Infectious disease

A 68-year-old woman presents to Casualty with a two day history of pain and swelling of the right ankle. She could not recall any history of recent trauma. On examination she was febrile, temperature 38.1 C. The right ankle was swollen and very tender with a reduced range of movement.

Which of the following investigations would be of most help in establishing the diagnosis?

- 1- Aspiration of the right ankle
- 2- Blood cultures
- 3- Erythrocyte sedimentation rate
- 4- Serum urate level

5- X-ray of the right ankle

Answer & Comments

Answer: 1- Aspiration of the right ankle

Septic arthritis is a medical emergency and this is the most likely diagnosis in this case. It is essential that the joint is aspirated in order to establish a microbiological diagnosis that will guide appropriate treatment. All of the other investigations listed would be of value in managing this patient, but in this setting joint aspiration is critical.



[Q: 1111] OnExamination - Infectious disease

A 23-year-old male presented with a two-week history of dysuria and purulent penile discharge.

Gram stain of a urethral swab showed Gram-negative intracellular diplococci.

Which one of the following is the most likely causative organism?

- 1- Chlamydia trachomatis
- 2- Cytomegalovirus
- 3- Mycoplasma hominis
- 4- Neisseria gonorrhoeae
- 5- Ureaplasma urealyticum

Answer & Comments

Answer: 4- Neisseria gonorrhoeae

Neisseria gonorrhoea occurs in young adults and is often preceded by a migratory tendonitis or arthritis. Gram's stain is positive in 25% and culture positive in 50%. Neisseria gonorrhoeae is a species of Gram-negative bacteria responsible for the disease gonorrhoea. They are highly fastidious gram-negative cocci, that is, they require special nutrients to survive. These cocci typically appear in pairs (diplococci).



[Q: 1112] OnExamination -
Infectious disease

A 72-year-old gentleman presents with increasing shortness of breath, fever and cough. A chest X ray shows findings consistent with a right middle lobe pneumonia.

Which factor is associated with a worse prognosis?

- 1- Blood pressure of 120/80 mmHg
- 2- Respiratory rate of 18/min
- 3- Temperature of 37.2
- 4- Urea of 18 mmol/l
- 5- White cell count of 15x10⁹

Answer & Comments

Answer: 4- Urea of 18 mmol/l

BTS guidelines suggest increasing age, co-morbidity, respiratory rate above 30/min, BP less than 90 systolic, hypoxaemia, WCC less than 4 or greater than 20 x10⁹, chest radiographic signs, positive blood cultures, confusion and urea above 7 mmol/l are indicators of a worse prognosis associated with community acquired pneumonia.



[Q: 1113] OnExamination -
Infectious disease

A 26-year-old previously healthy woman has the sudden onset of mental confusion. She has a seizure and is brought to the hospital. Her vital signs show blood pressure 100/60 mm Hg, temperature 37 C., pulse 89, and respirations 22. A lumbar puncture reveals a normal opening pressure, and clear, colorless cerebrospinal fluid is obtained with 1 RBC and 20 WBC's (all lymphocytes), with normal glucose and protein. An MRI scan reveals swelling of the right temporal lobe with hemorrhagic areas.

Which of the following infectious agents is the most likely cause for these findings?

- 1- Haemophilus influenzae

- 2- Herpes simplex virus
- 3- Influenza virus
- 4- Mycobacterium tuberculosis
- 5- Neisseria meningitidis

Answer & Comments

Answer: 2- Herpes simplex virus

Haemorrhagic lesions of the temporal lobe are typical for Herpes simplex virus infection. Hemophilus influenzae is the organism most associated with meningitis in children. Neisseria meningitidis would cause meningitis - however, in this case there are lymphocytes not neutrophils in the CSF and a normal not low glucose.



[Q: 1114] OnExamination -
Infectious disease

Which is true of herpes simplex encephalitis?

- 1- brain MRI is characteristically normal
- 2- fits are uncommon
- 3- genital herpes is usually present
- 4- temporal lobe involvement is common
- 5- viral identification using polymerase chain reaction on CSF is non-specific

Answer & Comments

Answer: 4- temporal lobe involvement is common

Herpes simplex encephalitis (HSE) is associated with high signal in one or both temporal lobes (limbic encephalitis). Seizures are commonly present in HSE. Herpes Simplex Virus type 1 is the causative virus (Not type 2 which is associated with genital herpes). PCR for herpes simplex virus on CSF is highly specific test.



[Q: 1115] OnExamination -
Infectious disease

A 15-year-old girl presents with fever, malaise and sore throat. Examination reveals a temperature of 38.3 °C with cervical lymphadenopathy. Her results show:

Haemoglobin 12.8 g/dl (11.5-16)

White cell count $9.8 \times 10^9/L$ (4-11)

Neutrophils $3 \times 10^9/L$

Lymphocytes $4.5 \times 10^9/L$

Blood film reveals atypical mononuclear cells

What is the most likely diagnosis?

- 1- Acute Lymphoblastic Leukaemia
- 2- Brucellosis
- 3- Epstein-Barr viral infection
- 4- Hodgkin's disease
- 5- Sarcoidosis

Answer & Comments

Answer: 3- Epstein-Barr viral infection

The diagnosis is EBV infection, Infectious Mononucleosis, which may be confirmed by the presence of IgM to EBV.



[Q: 1116] OnExamination -
Infectious disease

A 45-year-old man has been diagnosed with pulmonary tuberculosis.

Which of the following investigations is essential prior to starting antituberculous therapy?

- 1- Full blood count
- 2- Liver function test
- 3- Plasma glucose
- 4- Urine for acid-fast bacilli
- 5- Vitamin B6

Answer & Comments

Answer: 2- Liver function test

Hepatotoxicity is a feature of antituberculous treatment. "Liver function should be checked before treatment for clinical cases."



[Q: 1117] OnExamination -
Nephrology

Which of the following statements regarding idiopathic membranous nephropathy is correct?

- 1- It characteristically presents in the first decade of life.
- 2- Progression to end-stage renal failure is rapid.
- 3- immune complex deposits are typically seen in the glomerular mesangium.
- 4- Males are twice as commonly affected as females.
- 5- The nephritic syndrome is a characteristic presentation.

Answer & Comments

Answer: 4- Males are twice as commonly affected as females.

Membranous nephropathy is characterised by thickened basement membranes and monotonous granular deposits of IgG and C3 distributed in the epimembranous space of virtually all glomerular capillaries. The mesangium may be involved at a later stage of the disease and is more typical of secondary disease. It is typically seen in the over 40 age group with a male predominance of 2 to 1 and is associated with a variable prognosis with 25% developing ESRF over 10 years and 25% going into remission. There is a higher rate of remission for the idiopathic form. The majority of patients manifest with a pure nephrotic syndrome. A nephritic presentation is rare.



[Q: 1118] OnExamination -
Nephrology

The following are complications of nephrotic syndrome with the exception of

- 1- acute renal failure
- 2- accelerated hypertension

- 3- hypocalcaemia
- 4- pneumococcal infection
- 5- venous thrombosis

Answer & Comments

Answer: 2- accelerated hypertension

Complications also include hyperlipidaemia, protein malnutrition and loss of binding proteins in urine. Nephrotic syndrome likely to be associated with hypocalcaemia (Vit D binding protein and Vitamin D lost in nephrotic urine) and hypovolaemia (low blood pressure).



[Q: 1119] OnExamination -
Nephrology

A 30-year-old female presents with fevers, and a 3 month history of malaise.

Results show:

Creatinine 250 micromol/l

Complement C₃ 23 mg/dL (65 - 190)

What is the likely diagnosis?

- 1- HIV nephropathy
- 2- Infective endocarditis
- 3- Membranous Nephropathy
- 4- Microscopic Polyangiitis
- 5- Minimal change nephropathy

Answer & Comments

Answer: 2- Infective endocarditis

Hypocomplementaemia is associated with either vasculitides such as SLE, cryoglobulinaemia but is also associated with a non-vasculitic process such as SBE. In this case with the 3 month history and fevers SBE is suggested. In microscopic polyangiitis, which is classically small vessel, complement would be expected to be normal.



[Q: 1120] OnExamination -
Nephrology

Which one of the following cytokines is strongly implicated in renal scarring?

- 1- interferon alpha
- 2- interleukin-1
- 3- granulocyte colony stimulating factor
- 4- transforming growth factor-beta
- 5- tumour necrosis factor alpha

Answer & Comments

Answer: 4- transforming growth factor-beta

TGF-beta is a potent recruiter for fibroblasts which are implicated in renal scarring. IFN-alpha is implicated more in lymphocyte response and IL-1/TNF-alpha in the acute phase response. G-CSF is a stimulant of granulocyte cell line maturation.



[Q: 1121] OnExamination -
Nephrology

Which one of the following statements regarding renal function is correct?

- 1- The daily solute excretion will lie between 75 and 300 mosmol
- 2- The permeability of the proximal nephron to water increases in the presence of vasopressin
- 3- The rate of ammonium excretion in urine is inversely related to the rate of urinary hydrogen ion excretion
- 4- A ten minute period of hyperventilation will normally be expected to lead to an increased rate of bicarbonate excretion in urine
- 5- Sodium reabsorption in the tubules is mainly controlled by aldosterone

Answer & Comments

Answer: 4- A ten minute period of hyperventilation will normally be expected to lead to an increased rate of bicarbonate excretion in urine

AVP acts on the collecting ducts increasing permeability to water. The total solute excretion is approximately 700 mosmol/d. Sodium reabsorption is mostly through active transport in the loop of Henle with only a modest reabsorption facilitated by aldosterone. A ten minute period of hyperventilation would cause a respiratory alkalosis leading to an increased secretion of bicarbonate and retention of Hydrogen ions. The rate of ammonium excretion is proportional to the rate of hydrogen ion excretion.



[Q: 1122] OnExamination -
Nephrology

Which of the following is a feature of cystinuria?

- 1- accumulation of cystine in the kidney
- 2- a useful response to acidification of urine
- 3- autosomal dominant inheritance
- 4- excessive urinary arginine excretion
- 5- radiolucent urinary calculi

Answer & Comments

Answer: 4- excessive urinary arginine excretion

Cystinuria is the commonest inborn error of amino acid transport. Amino acids excreted in urine are cystine, ornithine, arginine and lysine (mnemonic - COAL). The renal stones are radio-opaque due to the presence of sulphur. It is inherited as an autosomal recessive condition. Management includes alkalinization along with high fluid intake (>4 L/day); d-penicillamine may also be used.

It is cystinosis that leads to accumulation of cystine in the kidney.



[Q: 1123] OnExamination - Nephrology

Which of the following is least likely with the HLA complex?

- 1- CD8 T-cells recognise antigen when co-presented with Major histocompatibility complex (MHC) Class I
- 2- CD4 T-cells recognise antigen when co-presented with MHC Class II
- 3- Polymorphisms occur in Class I, but not Class II, MHC genes
- 4- Multiple sclerosis is associated with HLA DR2
- 5- HLA matching is more important in kidney transplantation than liver transplantation

Answer & Comments

Answer: 3- Polymorphisms occur in Class I, but not Class II, MHC genes

Polymorphisms occur in both Class I and II genes. Cytotoxic T-cells express the molecule CD8 on the cell surface and only recognise antigen when presented by the T-cell receptor (TCR) in conjunction with Class I MHC. T-helper cells express CD4 on the cell surface and only recognise antigen when presented by TCR and Class II MHC. T-helper cells divided into Th1 and Th2, depending on function & cytokines released: Th1 cells secrete IL-2 and interferon-gamma and are involved in stimulating a cytotoxic immune response; Th2 cells secrete IL-4, IL-5, IL-10 and stimulate a humoral (antibody) response by B-cells. Liver allografts are less immunogenic than kidney grafts.



[Q: 1124] OnExamination - Nephrology

Which of the following concerning the pH of urine is correct?

- 1- is a useful indicator of the acid/base balance of the blood
- 2- rises on a vegetarian diet
- 3- is determined by the concentration of ammonium
- 4- is lower than 5.5 in renal tubular acidosis
- 5- would be above 7.0 after prolonged and severe vomiting

Answer & Comments

Answer: 2- rises on a vegetarian diet

c - excretion of ammonium occurs when an acid urine is produced but the pH of urine is of course determined by the concentration of H⁺ ions d-unable to lower the pH to less than 5.5 in RTA e- This would be expected in an attempt to compensate for the loss of acid however when there is extracellular fluid depletion the retention of sodium takes priority. Instead of bicarbonate being excreted it is reabsorbed in the proximal and distal nephron and this perpetuates the metabolic alkalosis until the fluid balance is restored with IV fluids.



[Q: 1125] OnExamination - Nephrology

A 7-year-old boy is admitted with renal colic due to renal calculus. His mother has a similar history of recurrent calculi.

What is the most likely explanation for recurrent renal calculi in both mother and child?

- 1- Cystinosis
- 2- Cystinuria
- 3- Hyperoxaluria
- 4- Idiopathic hypercalciuria
- 5- Urate uropathy

Answer & Comments

Answer: 4- Idiopathic hypercalciuria

Idiopathic hypercalciuria has a familial or sporadic pattern. In the familial pattern an autosomal dominant inheritance is present. The type of the disease is identical in affected members of the same family and the typical presentation is of recurrent urinary calculi. Cystinuria, cystinosis, urate uropathy and hyperoxaluria are autosomal recessive conditions.



[Q: 1126] OnExamination -
Nephrology

A 45-year-old man presented to the Nephrology clinic with severe generalized oedema.

Investigations:

Serum albumin 20 g/L

24-hour urinary protein excretion 14.6 g (<0.2 g)

Renal biopsy Normal on light microscopy, normal on immunofluorescence

There was no significant improvement in his symptoms or signs after three months' treatment with prednisolone 60 mg OD.

What is the most likely diagnosis?

- 1- Focal segmental glomerulosclerosis
- 2- Membranous nephropathy
- 3- Minimal change disease
- 4- Myeloma
- 5- Renal vein thrombosis

Answer & Comments

Answer: 3- Minimal change disease

This patient has symptoms and signs of a nephrotic syndrome. A renal biopsy was normal on light microscopy and immunofluorescence.

Focal segmental glomerulosclerosis and membranous nephropathy are all histological diagnoses. As this patients' renal biopsy was normal, he cannot have these diagnoses.

Myeloma generally causes a cast nephropathy, but can also cause Fanconi syndrome, light chain amyloidosis, light chain deposition, infiltration of renal interstitium by plasma cells, calcium precipitation and renal infection. This may cause acute renal failure, chronic renal failure or nephrotic syndrome. All the above lesions should be visible on light microscopy of the renal biopsy.

Renal vein thrombosis is an uncommon cause of the nephrotic syndrome. It is not normally associated with such heavy proteinuria and, if it is, there are usually changes seen on microscopy.

The likely diagnosis is minimal change nephropathy. Although it is more common in children it does occur in adults and is then associated with poorer outcomes. As well as heavy proteinuria oval fat bodies may also be seen in the urine.



[Q: 1127] OnExamination -
Nephrology

In asymptomatic chronic renal failure:

- 1- there is increase in tubular excretion of urate
- 2- serum ionised [calcium] is normal
- 3- serum [phosphate] characteristically increased before GFR falls to 30ml/min
- 4- increase serum [alkaline phosphatase] mainly due to liver isoenzyme
- 5- decrease in blood pressure accompanied by increase in extracellular fluid

Answer & Comments

Answer: 2- serum ionised [calcium] is normal

Urate retention is common feature in CRF. Total serum [calcium] is reduced or at lower limits of normal, but ionised [calcium] is normal unless steps are taken to treat acidosis actively eg with sodium bicarbonate. Plasma phosphate and chloride are almost always

raised. Hyperphosphataemia occurs when GFR falls <30ml/min. Increased bone alkaline phosphatase reflects osteodystrophy. Hypertension is due largely to salt and water retention, and also overactivity of renin angiotensin systems.



[Q: 1128] OnExamination - Nephrology

An 18-year-old female student attends the clinic as her father has just died with end-stage renal failure. He had been diagnosed with autosomal dominant polycystic kidney disease. She wishes to know what investigations she requires.

Which of the following is an appropriate strategy in her management?

- 1- Geneticist referral
- 2- Glomerular Filtration Rate Estimation
- 3- MRI brain
- 4- Ultrasound of the renal tract
- 5- Urine Dipstick

Answer & Comments

Answer: 1- Geneticist referral

An ultrasound of the renal tract may not be appropriate at this patients' age, given that cysts may not become apparent until the age of 20. Gross haematuria in ADPKD carries a poor prognosis, however microscopic haematuria may be a complication. Subarachnoid haemorrhage may be a cause of mortality in 9% of patients with ADPKD, though 8% of patients have an asymptomatic intracranial aneurysm, and if the diagnosis is confirmed and there is a strong history of Subarachnoid Haemorrhage then an MRI would be indicated. Genetic counselling is most appropriate in this context and genetic linkage analysis may be utilized.



[Q: 1129] OnExamination - Nephrology

Which of the following concerning renal blood flow is true?

- 1- is 40% of the cardiac output at rest
- 2- can be measured using the Fick principle
- 3- is higher in the medulla than the cortex
- 4- is increased when renal nerves are stimulated
- 5- is decreased in response to hypoxia

Answer & Comments

Answer: 2- can be measured using the Fick principle

Renal blood flow is approximately 25% of cardiac output. The 'Fick principle' can be used to estimate RBF through clearance. RBF is higher in the cortex than medulla as one might expect with the increasing glomeruli in this region. Sympathetic stimuli produce vasoconstriction and RBF should be increased in response to hypoxia.



[Q: 1130] OnExamination - Nephrology

A 16-year-old female presents with a three year history of recurrent colicky loin pain. One year ago she passed a renal calculus.

24 hour urine collection showed normal levels of calcium, phosphate and urate, but elevated levels of arginine, cystine, lysine and ornithine.

Which one of the following features is characteristic of this condition?

- 1- Accumulation of cystine in collecting system
- 2- Autosomal dominant inheritance
- 3- Cystine deposits within the Cornea
- 4- Functional defects within the glomeruli
- 5- Radiolucent renal stone formation

Answer & Comments

Answer: 1- Accumulation of cystine in collecting system

This condition is typical of Cystinuria,/nephropathic cystinosis an autosomal recessive genetic defect in membrane transport for cystine, lysine, ornithine and arginine in epithelial cells. The disease is characterised by recurrent nephrolithiasis. Radiolucent stones are not specific for this condition and may be seen with uric acid stones.



[Q: 1131] OnExamination - Nephrology

A 30-year-old woman presented with hypertension (160/110 mmHg), elevated titres of antibodies to double-stranded DNA, and proteinuria (1g per 24 hours). A renal biopsy demonstrated WHO class II lupus nephritis (mesangial disease).

What is the most appropriate single treatment for this patient?

- 1- antihypertensive medication
- 2- high-dose corticosteroids
- 3- intravenous cyclophosphamide
- 4- oral cyclophosphamide
- 5- plasma exchange

Answer & Comments

Answer: 1- antihypertensive medication

There is good evidence that immunosuppression could alter outcome in the presence of proliferative glomerulonephritis but not in mesangial or membranous glomerulonephritis. Therefore the best line of treatment would be a conservative approach to address risk factors for progression of renal impairment such as uncontrolled hypertension. There is no good evidence to support plasma exchange as an

effective treatment modality in lupus nephritis.



[Q: 1132] OnExamination - Nephrology

A 70-year-old woman was referred with a six-week history of painless macroscopic haematuria. Her only medications were IM sodium aurothiomalate and oral ibuprofen, which she took for rheumatoid arthritis.

Investigations:

Serum creatinine 92 umol/L

Urine dipstick Blood ++++

Protein +

Abdominal plain X-Ray Normal

Ultrasound kidneys & renal tract Normal

Which one of the following is the best initial investigation?

- 1- Cystoscopy
- 2- Intravenous urogram (IVU)
- 3- Renal biopsy
- 4- Stop Ibuprofen
- 5- Stop sodium aurothiomalate

Answer & Comments

Answer: 1- Cystoscopy

This lady has macroscopic haematuria and a trace of protein in the urine. She is taking ibuprofen and IM sodium aurothiomalate (gold). Her renal function is normal, as is the plain abdominal x-ray and USS renal tract.

Ibuprofen is a common cause of interstitial nephritis, and this could present with painless haematuria. Sodium aurothiomalate commonly causes trace proteinuria, and if present on its own is unimportant, but it can also cause membranous glomerulonephritis, which this lady could have.

However, the most important thing to exclude would be a bladder tumour initially before

embarking upon a renal biopsy. Therefore cystoscopy is the best initial investigation.



[Q: 1133] OnExamination -
Nephrology

A 21-year-old female presents with a joint pains and rash. On examination her blood pressure was 140/100 mmHg. Investigations reveal:

Creatinine 90 umol/L (60-100)

anti dsDNA antibodies strongly positive (0-73)

24 hour urinary protein excretion 1.7g (<0.2)

renal biopsy membranous nephropathy

What is the most appropriate next treatment

- 1- ACE inhibitor for blood pressure control
- 2- Cyclophosphamide
- 3- NSAIDs for arthralgia
- 4- Prednisolone for immunosuppression
- 5- Warfarin anticoagulation

Answer & Comments

Answer: 1- ACE inhibitor for blood pressure control

This patient has SLE, with disease affecting her kidneys. The biopsy has shown pure membranous nephropathy, classifying the disease as class V(a) on the 1995 WHO classification of lupus nephritis. Class V(a and b) have a low rate of progression to renal failure. There is no clear consensus on treatment, but most nephrologists would start treatment with prednisolone. Cyclophosphamide could be added in later as a steroid sparing agent. Warfarin is not considered an appropriate treatment, as if this lady exhibited any pro-thrombotic tendencies (on the background of antiphospholipid antibody disease) she should be started on aspirin. Non steroidal anti-inflammatory medication would treat her arthralgia, but

would have no affect on the prognosis of the disease. As there is a low rate of progression of renal disease in this patient, the blood pressure should be aggressively treated with an ACE inhibitor, and this could assist in reducing the proteinuria. Therefore, the correct answer should be A, but closely followed by answer D.



[Q: 1134] OnExamination -
Nephrology

A 16-year-old girl developed pulmonary haemorrhage and acute renal failure requiring dialysis.

Investigations revealed:

Renal biopsy: crescentic glomerulonephritis

Which one of the following antibodies is most likely to be found in the blood?

- 1- Anticardiolipin
- 2- Anticentromere
- 3- Antimitochondrial
- 4- Antimyeloperoxidase
- 5- Antinuclear

Answer & Comments

Answer: 4- Antimyeloperoxidase

This patient manifests a pulmonary renal syndrome which is most commonly due to an ANCA positive vasculitis and less commonly due to Goodpasture's syndrome(anti GBM antibodies). ANCA antibodies are of 2 types:

" C-ANCA which correlates with antiproteinase 3 antibodies (PR3)

" P-ANCA which correlates with antimyeloperoxidase antibodies. P-ANCA/MPO antibodies are highly sensitive and specific for rapidly progressive glomerulonephritis and haemorrhagic alveolar capillaritis.

Antimitochondrial antibodies are found in primary billiary cirrhosis.

Anticentromere antibodies are found in CREST /Scleroderma syndrome.

ANA and anticardiolipin antibodies are found in SLE which is not a cause of pulmonary renal syndrome.



[Q: 1135] OnExamination -
Nephrology

A 65-year-old male patient is admitted with renal failure and is diagnosed with acute tubular necrosis.

Which of the following is least likely to be the cause of acute tubular necrosis?

- 1- Rhabdomyolysis
- 2- Paracetamol poisoning
- 3- Hypovolaemia
- 4- Hypertension
- 5- Corticosteroid therapy

Answer & Comments

Answer: 5- Corticosteroid therapy

Renal failure from ATN occurs in 25% patients with severe hepatic damage. Accelerated hypertension can cause small vessel obstruction, with proliferative endarteritis of intralobular arteries and fibrinoid necrosis of afferent arterioles and glomerular capillary tuft. Corticosteroid therapy has not been associated with ATN. Other causes of ATN include hypotension, hepatic failure, eclampsia and drugs such as aminoglycosides, Cephalosporins, Cisplatin, Amphotericin.



[Q: 1136] OnExamination -
Nephrology

A 45-year-old lady presents with fatigue and has established End Stage Renal Failure. She has been on haemodialysis for the past three years and receives dialysis for 3 hours three times a week at a regional haemodialysis centre.

At one of her regular visits for haemodialysis she is found to have the following observations and investigations.

Blood Pressure 170/95

serum K⁺ 5.7 mmol/L (3.5 - 4.9)

serum corrected calcium 2.0 mmol/L (2.2 - 2.6)

Hb 9.0 g/dl (11.5 - 16.5)

Creatinine 1300 mmol/l

Post-dialysis her Blood Pressure is recorded as 160/95.

Which of the following is the best management for this lady?

- 1- increase dialysis hours
- 2- treat anaemia with erythropoietin
- 3- treat hyperkalaemia
- 4- treat hypocalcaemia
- 5- treat hypertension with ramipril

Answer & Comments

Answer: 2- treat anaemia with erythropoietin

This person's main complaints are of fatigue. Treating her with erythropoietin would therefore be the most appropriate therapy particularly with her anaemia. Increasing dialysis is unlikely to be acceptable to most patients and renal units though this is an option some patients would choose, especially those on 'home haemodialysis'. Vascular disease is an important cause of death in dialysis patients and this lady may very well need additional treatment of blood pressure.



[Q: 1137] OnExamination -
Nephrology

A 63-year-old male recently admitted with sepsis is noted to have a urine output of approximately 20 mls per hour.

The oliguria is more likely to be due to prerenal failure than intrinsic renal failure if:

- 1- A urine free of red blood cells or casts
- 2- A urine:plasma urea ratio <3
- 3- urine osmolality <350 mOsm/l
- 4- a blood pressure of 150/90 and good tissue perfusion.
- 5- urinary sodium >10mmol/l

Answer & Comments

Answer: 1- A urine free of red blood cells or casts

Oliguria defined as <400ml urine/day. Red cell casts present in acute glomerulonephritis, renal vasculitis, accelerated hypertension and interstitial nephritis. Pre-renal failure is renal dysfunction due to hypoperfusion (urinary sodium <20, urine osmolality >500, urine/plasma ratio >8, and urine/plasma creatinine >40) and acute tubular necrosis is acute renal failure due to circulatory compromise and/or nephrotoxins (urinary sodium >40, urine osmolality <350, urine/plasma ratio <3, and urine/plasma creatinine <20).



[Q: 1138] OnExamination - Nephrology

In chronic untreated renal failure which of the following findings is characteristic?

- 1- Metabolic alkalosis
- 2- Hypokalaemia
- 3- Hyperosmolar dehydration
- 4- Hypercalcaemia
- 5- Hypercalcinuria

Answer & Comments

Answer: 5- Hypercalcinuria

Major pathophysiological abnormalities of chronic renal failure:

" Accumulation of nitrogenous waste products.

" Acidosis: bicarbonate wasting, decreased ammonia secretion, decreased acid excretion.

" Sodium wasting: solute diuresis, tubular damage.

" Sodium retention: Nephrotic Syndrome, CCF, anuria, excess sodium intake.

" Urinary concentrating defect: nephron loss, solute diuresis.

" Hyperkalaemia: decreased GFR, acidosis, hyperaldosteronism.

" Renal osteodystrophy: decreased intestinal calcium absorption, impaired 12-dihydroxy Vitamin D production, secondary hyperparathyroidism.

" Growth retardation: protein calorie deficiency, renal osteodystrophy, acidosis, anaemia.

" Anaemia: decreased erythropoietin production, low grade haemolysis, inadequate intake.

" Bleeding tendency: thrombocytopenia, decreased platelet function.

" Infection: defective granulocyte function.

" Neurology: uraemia, aluminium toxicity results in fatigue, poor concentration, headache, memory loss, slurred speech, muscle weakness and cramps, seizures and coma.

" GI ulceration: gastric acid hypersecretion.

" Hypertension: sodium and water overload, hyperammonaemia.

" Hypertriglyceridaemia: decreased plasma lipoprotein lipase activity.

" Pericarditis and cardiomyopathy: cause unknown.

" Glucose intolerance: tissue insulin resistance.



[Q: 1139] OnExamination -
Nephrology

34-year-old female presents with shortness of breath. She has been treated for Asthma by her GP with an inhaled steroid, but the GP has documented an eosinophilia of $1.1 \times 10^9/L$ (14%) (Normal $<0.1 \times 10^9/L$). She has been referred to the clinic because her GP found her creatinine to be $347 \mu\text{mol/l}$ ($60\text{--}110\mu\text{mol/l}$).

Which of the following would support a diagnosis of Churg-Strauss syndrome?

- 1- Extravascular eosinophils on vascular biopsy
- 2- Fixed pulmonary infiltrates on chest radiographs
- 3- Peak flow $<150\text{ml/minute}$
- 4- Peripheral alveolar filling infiltrate predominantly in the upper lobes on a chest radiograph
- 5- Peripheral "stocking" neuropathy

Answer & Comments

Answer: 1- Extravascular eosinophils on vascular biopsy

A diagnosis of Churg-Strauss syndrome requires four of the following features: asthma, eosinophilia greater than 10%, mononeuropathy or polyneuropathy, paranasal sinus abnormality, non-fixed pulmonary infiltrates visible on chest radiographs and blood vessels with extravascular eosinophils. Peripheral alveolar filling infiltrate predominantly in the upper lobes on a chest radiograph is typical of chronic eosinophilic pneumonia. A peripheral "stocking and glove" neuropathy is not typical of Churg-Strauss syndrome and is more common in type 2 diabetes.



[Q: 1140] OnExamination -
Nephrology

A 16 year-old female presents with ankle swelling 4 days after having had a sore throat. On examination she had a blood pressure of $125/80 \text{ mmHg}$ and ankle oedema. Investigations reveal:

creatinine $90 \mu\text{mol/L}$ ($50\text{--}100$)

albumin 25 g/L ($37\text{--}45$)

24 hour urinary protein 9 g (<0.2)

What is the most likely diagnosis?

- 1- idiopathic membranous nephropathy
- 2- IgA nephropathy
- 3- membranoproliferative glomerulonephritis
- 4- minimal change nephropathy
- 5- post-streptococcal glomerulonephritis

Answer & Comments

Answer: 2- IgA nephropathy

Idiopathic membranous nephropathy (A) accounts for 2-5% of cases of nephritic syndrome in children, and 20-30% of cases in adults. The immune mechanism that leads to the development of membranous nephropathy is unknown. Histologically, it is characterised by diffuse thickening of the glomerular basement membrane (GBM) on light microscopy. On immunofluorescence, the thickening is caused by immune deposits of IgG and C3, on the subepithelial surface of the GBM. When not idiopathic, it is associated with AI diseases (SLE, Rheumatoid arthritis, thyroid disease), Drugs (Gold, penicillamine, captopril), Malignancy (Bronchus, breast, stomach, colon, prostate), Infections (Hep B, Syphilis, Leprosy, Filariasis), and diabetes mellitus. Membranoproliferative (or mesangiocapillary) glomerulonephritis (C) can be classed into three types (I, II, and III) depending on which complement pathway is activated. It is associated with SLE, cryoglobulinaemia with or without Hep C,

chronic infections (SBE) or with neoplasms. It is not associated acutely with upper respiratory tract infections. Minimal change nephropathy (D) is the most common form of nephrotic syndrome in children. The histological findings on light microscopy are normal or small looking glomeruli. On electron microscopy there is effacement of the epithelial cell foot processes over the outer surface of the GBM. It tends to be steroid responsive in children, but over 60% of children will have further relapses. In adults, it is associated with Hodgkins lymphoma, and other carcinomas. Post streptococcal GN (E) as the name implies occurs 10-14 days after an acute infection. The typical case occurs following infection with group A Lancefield streptococci (?haemolytic strep, S pyogenes) either causing pharyngitis or skin infections. It is more common in the developing world. The histology shows diffuse proliferative GN, with infiltration by neutrophil polymorphs. The main treatment is eradication of the infection (10/7 course of penicillin) and symptomatic relief of the acute nephritis. The need for dialysis is uncommon, and complete recovery of renal function should occur. The correct answer is IgA nephritis (B). IgA nephritis is most common during the second and third decade of life. It commonly occurs within two days of an onset of an upper respiratory tract infection, or less commonly infection of other mucous membranes (e.g. GI, Bladder, Breast). It should be diagnosed by a renal biopsy, where IgA is seen deposited in the mesangium. The treatment of IgA nephritis is variable. In a patient with haematuria only, the treatment is conservative. When there is nephrotic range proteinuria (>3g/day- as in this case) an 8-12 week course of prednisolone should be prescribed. If the proteinuria is <3g/day an ACE inhibitor can be used. In all patients, careful control of blood pressure should be achieved, by using ACE inhibitors in the first instance, and regular follow up of renal function and urinalysis. 30% of children will have a spontaneous remission

within 10 years, but 25% will go on to develop ESRF within 20 years.



[Q: 1141] OnExamination -
Nephrology

A 16-year-old girl presented to the nephrology clinic with a four-day history of steadily increasing generalised oedema. There was no past history of note. On examination she weighed 45kg. Her blood pressure was 90/55 mmHg.

Investigations revealed:

Serum creatinine 55 umol/L

Serum albumin 20 g/L

24 hour urinary protein excretion 4.8g (<0.2g)

Ultrasound scan of kidneys Normal

If this patient is treated with prednisolone (1mg/kg for 6 weeks), what are the chances of her disease going into complete remission?

- 1- <20%
- 2- 20-39%
- 3- 40-59%
- 4- 60-80%
- 5- >80%

Answer & Comments

Answer: 2- 20 ?39%

This girl has probably developed idiopathic glomerulonephritis, which accounts for 90% of all childhood cases of the nephrotic syndrome. The main cause is minimal change nephrotic syndrome.

The first line treatment for minimal change nephropathy is prednisolone for 4-6 weeks (60mg/m²) reducing to 40mg/m² for a further 4-6 weeks. With this treatment 93% of children will respond with complete loss of proteinuria within 8 weeks. However, once remission is induced, 66% of children will have at least one relapse (34% will have complete remission). Between 40 and 55% of children

affected, who initially respond to steroids will develop multiple relapses when the steroids are reduced. Early, frequent relapses (3 or more in the first 6 months) signify a relapsing course, and requires treatment with cyclophosphamide.



[Q: 1142] OnExamination -
Nephrology

A 42-year-old female with a recent diagnosis of systemic sclerosis, is referred to hospital with a complaint of headaches and blurred vision. She has a past medical history of asthma. On examination, her blood pressure is 230/120, and there is bilateral papilloedema.

Which of the following medications should be prescribed immediately?

- 1- IV Furosemide
- 2- IV Labetolol
- 3- IV Sodium Nitroprusside
- 4- Oral Enalapril
- 5- Sublingual Nimodipine

Answer & Comments

Answer: 4- Oral Enalapril

Systemic sclerosis is a systemic disorder characterised by skin thickening due to the deposition of collagen in the dermis. Adverse prognostic features are renal, cardiac or pulmonary involvement. A major complication is the development of scleroderma renal crisis. This is characterised by the abrupt onset of severe hypertension, usually with retinopathy, together with rapid deterioration of renal function and heart failure. It develops in 8-15% of patients with diffuse systemic sclerosis, especially associated with rapid progression of diffuse skin disease. It usually presents early, within three years of diagnosis. The pathogenic mechanisms leading to renal damage are not known. The clinical presentation is typically with the symptoms of malignant hypertension, with headaches,

blurred vision, fits and heart failure. Renal function is impaired and usually rapidly deteriorates. The hypertension is almost always severe with a diastolic BP over 100 mmHg in 90% of patients. There is hypertensive retinopathy in about 85% of patients, with exudates and haemorrhages and if severe, papilloedema. Scleroderma renal crisis is a medical emergency. The hypertension should be treated with an ACE inhibitor. The aim is to reduce the blood pressure gradually, as an abrupt fall can lead to cerebral ischaemia or infarctions (as in any accelerated hypertension). Calcium channel blockers may be added to ACE inhibitors. Deterioration in renal function can be rapid, with gross pulmonary oedema; therefore patients with scleroderma renal crisis should be managed in hospitals with facilities for dialysis.



[Q: 1143] OnExamination -
Nephrology

A 45-year-old man with chronic renal failure presents to clinic complaining of increasing fatigue and weakness. He receives three hours of haemodialysis, thrice weekly. His blood pressure is measured at 176/110 mmHg pre-dialysis and 166/95 mmHg post-dialysis.

Investigations pre-dialysis show:

Hb	9.5 g/dL
Potassium	6.9 mmol/L
Creatinine	1567 umol/L
Calcium(corrected)	2.1 mmol/L

Which of the following options is most appropriate initial management for this patient?

- 1- Give alfacalcidol to correct hypocalcaemia
- 2- Increase the duration of each dialysis session
- 3- Reduce the potassium concentration in the dialysate

- 4- Start erythropoietin to increase haemoglobin level
- 5- Start ramipril to gain better control of his blood pressure

Answer & Comments

Answer: 2- Increase the duration of each dialysis session

This patient has been poorly managed! Again the question is the issue here. What is the most appropriate management. in this case.

Pre dialysis blood pressure and blood investigations are a poor indication of dialysis adequacy.

It would be more helpful in this question to have post dialysis blood results, especially urea, which could give an idea of dialysis adequacy.

His post dialysis blood pressure is too high. It should be controlled with antihypertensive medication if the patient is achieving his dry weight with fluid ultra filtration on haemodialysis.

His haemoglobin is lower than 11g/dL, which is the minimum level a patient with end stage renal failure should have. Initially he should be treated with IV iron, and if the haemoglobin is still low, erythropoietin should be commenced.

Hyperkalaemia can cause lethargy and muscle weakness, but only if the levels are over 7mmol/L. The above potassium level is probably expected pre dialysis.

His corrected calcium is borderline low (aim for 2.2-2.6mmol/L), but should not cause the above symptoms.

This patient has non-specific symptoms. He is hypertensive post dialysis, and has a very high pre dialysis serum creatinine. He requires further management of his haemoglobin, blood pressure and calcium levels.

None of the above would cause the non-specific deterioration seen in this patient, and therefore the most appropriate management strategy that would affect most things would be increasing the dialysis adequacy, by increasing the duration of each dialysis session.



[Q: 1144] OnExamination - Nephrology

A 30-year-old woman receives a cadaveric renal transplantation after having with had renal failure with a neuropathic bladder for which she performed intermittent self-catheterisation. Six months after transplantation she presents with acute pain in the region of the transplanted kidney.

Which one of the following is the most likely reason for the pain?

- 1- Acute retention of urine
- 2- allograft rejection
- 3- pyelonephritis
- 4- renal calculi
- 5- renal infarction

Answer & Comments

Answer: 3- pyelonephritis

Acute urinary retention would not cause pain overlying a transplanted kidney, and as this lady self-catheterises, it would be an unlikely occurrence. Due to the elapsed time between the transplant and this episode, allograft rejection can be discounted. This is because chronic rejection (>3months post transplant) is a painless process, with difficult to control hypertension, proteinuria and slowly rising serum creatinine. Accelerated rejection (1-5 days post transplant) can present with fever, an acutely tender swollen graft, and rapidly rising serum creatinine. Acute rejection (5 days-3months) is clinically silent in the majority, but can present with a swollen, tender kidney. Renal infarction can also be

discounted. This can be a surgical complication of renal transplantation, but it presents early with a calyceal fistula and urinary leak. Renal stones could cause acute pain in the region of a transplanted kidney, but would be less likely in this patient than answer A. The answer in this case is acute pyelonephritis. This patient is in the intermediate stage of the post-transplantation immunosuppression, when the patient is most immunocompromised (3-6 months post-transplant). She is at high risk of an acute episode of pyelonephritis in the transplanted kidney, due to the immunosuppression, the neuropathic bladder and self-catheterisation. This would present like an acute rejection episode, with a tender swollen graft, low-grade pyrexia, and deteriorating graft function. This would be commonly associated with septicaemia in this patient, and requires parenteral antibiotics. If this lady was to be managed as a transplant rejection, with high dose IV steroids, the result could be catastrophic.



[Q: 1145] OnExamination -
Nephrology

A 60-year-old man wishes to act as a kidney donor to his 37-year-old wife. She has end-stage renal failure from polycystic kidney disease and is maintained on peritoneal dialysis. The couple have two teenage daughters, neither of whom have renal cysts on recent ultrasound scans.

Which one of the following statements is correct?

- 1- Living related donation from one of the daughters would be preferable to donation from the husband
- 2- Living unrelated donation is not recommended in cases of inherited renal disease
- 3- The age difference between husband and wife is a relative contraindication to transplantation

- 4- The husband should not be accepted for kidney donation until all siblings have been considered
- 5- The results of living unrelated kidney donation are sufficiently poor that organ donation should not proceed

Answer & Comments

Answer: 4- The husband should not be accepted for kidney donation until all siblings have been considered

Providing there is a sibling who is proven not to have polycystic kidney disease, living related donation should be considered as this would ensure a better match and better graft survival. As teenagers polycystic kidney disease may not be manifest ultrasonographically in her daughters. Living unrelated kidney donation does not produce bad results. In patients with polycystic kidney disease, or for other inherited diseases, a graft from an unrelated donor would not necessarily succumb to the same disease process. Where there is a shortage of donors, the age difference certainly would not be considered a relative contraindication to kidney donation.



[Q: 1146] OnExamination -
Nephrology

A 45-year-old man had recurrent nephrolithiasis. Renal function tests and serum calcium measurements were normal. A 24 hour urine collection revealed:

volume 3L

calcium 15 mmol/24 hours (2.5 - 7.5)

oxalate 200 mmol/24 hours (90 - 450)

uric acid 3 mmol/24 hours (1.48 - 4.45)

citrate 2mmol/24hours(0.3-3.4)

What is the most useful therapy to reduce stone formation?

- 1- allopurinol

- 2- dietary calcium restriction
- 3- penicillamine
- 4- potassium citrate
- 5- thiazide diuretic

Answer & Comments

Answer: 5- thiazide diuretic

This patient has hypercalciuria and thiazide diuretics can decrease urinary excretion of calcium and possibly oxalate. Dietary calcium restriction will not limit calciuria, given the large amount of calcium that can be mobilised from bone. The lack of hyperuricosuria and hypocitraturia excludes the other treatments offered.



[Q: 1147] OnExamination - Nephrology

A 14-year-old old boy presents with a sore throat and macroscopic haematuria.

What would light microscopy of a kidney biopsy most likely show?

- 1- Crescentic glomerulonephritis
- 2- Collapsed glomeruli
- 3- Mesangial hypercellularity
- 4- Segmental sclerosis
- 5- Normal tissue

Answer & Comments

Answer: 3- Mesangial hypercellularity

The most common cause of macroscopic haematuria in a child is IgA nephritis.

This usually develops 1-2 days after a sore throat. It is most common in the second and third decades of life, and is three times more common in males.

The urine may be frankly bloody, or may be the colour of cola. There are no clots in the urine, and the haematuria is generally

painless, although some patients complain of mild loin pain.

It tends to settle spontaneously within 5 days, although the episodes may be recurrent, lasting for one to two years.

Renal biopsy will show mesangial IgA deposition on immunofluorescence, and light microscopy will show mesangial hypercellularity and matrix expansion.



[Q: 1148] OnExamination - Nephrology

A 37-year-old woman underwent a kidney transplant which never functioned. A biopsy revealed pathological features consistent with acute rejection associated with anti-HLA antibodies.

Which type of immunoglobulin is expected to account for this process?

- 1- Ig D
- 2- Ig A
- 3- Ig E
- 4- Ig G
- 5- Ig M

Answer & Comments

Answer: 4- Ig G

This acute rejection is recognised and due to anti-IgG antibodies to the HLA incompatible tissues with primary activation of T cells. The acute response is treated with immunosuppressants.



[Q: 1149] OnExamination - Nephrology

Metastatic calcification in chronic renal failure:

- 1- unaffected by time on CAPD
- 2- rapidly reversed in all sites after parathyroidectomy

- 3- characteristically caused by calcium oxalate deposition
- 4- increased prevalence with time on haemodialysis
- 5- decreased by Vitamin D

Answer & Comments

Answer: 4- increased prevalence with time on haemodialysis

CRF associated with low serum calcium, hyperphosphataemia, increased PTH, reduced intestinal calcium absorption and raised alkaline phosphatase. Parathyroidectomy improves extraskelatal calcification, but vascular calcification improves less than periarticular calcification. Metastatic calcification due mainly to calcium phosphate deposition, although CRF managed with dialysis is the commonest cause of secondary oxalosis (acute arthritis of small joints with digital calcific deposits). Prolonged treatment with Vitamin D (hence hypercalcaemia and hyperphosphataemia) increases extraskelatal calcification.



[Q: 1150] OnExamination - Nephrology

A 17-year-old woman underwent a renal transplant. She was concerned about the effects of long-term Cyclosporin treatment.

Which one of the following is a common adverse effect of this drug?

- 1- Alopecia
- 2- Bone marrow depression
- 3- Hepatotoxicity
- 4- Nephrotoxicity
- 5- Paraesthesiae

Answer & Comments

Answer: 4- Nephrotoxicity

Cyclosporin causes hypertrichosis rather than alopecia and the most frequent adverse side effect of this drug is nephrotoxicity. Post renal transplant, the 2 most common causes of declining renal function are graft rejection and cyclosporin toxicity. Hepatotoxicity, paraesthesia are less common side effects of the drug.



[Q: 1151] OnExamination - Nephrology

In which of the following circumstances would the treatment of anaemia with erythropoietin still be expected to be effective?

- 1- Aluminium toxicity
- 2- Folate deficiency
- 3- Hyperkalaemia
- 4- Infection
- 5- Iron deficiency

Answer & Comments

Answer: 3- Hyperkalaemia

Epoetin (recombinant human erythropoietin) is used in chronic renal failure, to shorten the period of anaemia in those receiving platinum-based chemotherapy and prevention of anaemia in premature babies with low birth weight. Its efficacy may be impaired in certain circumstances particularly with iron deficiency but also with aluminium toxicity, folate deficiency and infection. In the latter, the switch to the acute phase proteins impairs its function. Its efficacy is unimpaired in hyperkalaemia.



[Q: 1152] OnExamination - Nephrology

A 23 year-old female presents at 16 weeks into her first pregnancy with a blood pressure of 144/96 mmHg. A 24 hour urine collection reveals a protein excretion of 0.7 g/d

What is the most likely explanation for these findings?

- 1- Essential hypertension
- 2- Gestational hypertension
- 3- Normal changes of pregnancy
- 4- Pre-eclampsia
- 5- Secondary hypertension

Answer & Comments

Answer: 5- Secondary hypertension

This pregnant woman has hypertension and proteinuria (as defined by a blood pressure above 140/90 and proteinuria above 0.3 g/d). It would not be regarded as normal to have this high a blood pressure or protein content of urine. Pre-eclampsia is a disease occurring in the second half of pregnancy (after 20 weeks gestation), and conventionally, characterised by pregnancy-induced hypertension, with proteinuria and often with oedema. Gestational hypertension is defined as blood pressure elevation detected for the first time after midpregnancy, without proteinuria. Essential hypertension is unlikely in this female as there is a suggestion of renal disease which makes, secondary hypertension the likely option.



[Q: 1153] OnExamination - Nephrology

A 60-year-old male presents with typical renal colic and one day later passes a small stone. However, the original X-ray of the abdomen revealed no obvious calculi.

What is the most likely composition of his calculus?

- 1- Calcium
- 2- Cystine
- 3- Oxalate
- 4- Phosphate
- 5- Uric acid

Answer & Comments

Answer: 5- Uric acid

The main constituent will be uric acid.

Major causes of stone formation:

" Calcium stones (80%) - hypercalciuria (e.g. primary hyperparathyroidism), hyperoxaluria (e.g. XS intake, ileal disease and bypass)

" Uric acid stones (10%) - high purine intake, high cell turnover

" Cystine stones (2%) - cystinuria (AR defect in dibasic amino acid transporter)

" Infection stones (5%) - chronic infection with urea splitting organisms causes stones made of magnesium ammonium phosphate and calcium phosphate

" Other stones (3%) - include xanthine stones, rare renal chloride channel mutations can cause stone formation

There appears to be a male predominance with a 2:1 ratio.

Calcium and infection stones are radio-opaque, cystine stones are weakly radio-opaque and urate stones are radiolucent.



[Q: 1154] OnExamination - Nephrology

A 68-year-old male is referred by his general practitioner with deteriorating hypertension and renal function.

Investigations show:

Serum creatinine 250 µmol/L (NR 60 - 110)

Urinalysis + protein

Renal ultrasound scan: left kidney 9cm long right kidney 7cm, no obstruction (10 - 12cm)

Which of the following would be the most appropriate investigation for this patient?

- 1- intravenous renography
- 2- isotope renography

- 3- MR angiography
- 4- renal biopsy
- 5- retrograde pyelography

Answer & Comments

Answer: 3- MR angiography

The diagnosis is likely to be atherosclerotic renal artery stenosis as suggested by the asymmetric reduction in renal size, with mild proteinuria quite common in the condition. Investigations include Captopril Renography, MR angiography which is virtually as good as renal arteriography. None of the other investigations are appropriate for RAS.



[Q: 1155] OnExamination - Nephrology

A 58-year-old man with longstanding hypertension was found to have a serum creatinine concentration of 275 micromol/L (60 - 110). Urinalysis showed blood ++ and protein >1 g/L. Renal ultrasound showed the left kidney to be 9.2 cm long, the right to be 8.9 cm long (normal range for both kidneys 10-12 cm), and neither kidney was obstructed.

What is the best investigation to diagnose the cause of the renal impairment?

- 1- intravenous urography
- 2- isotope renography
- 3- renal arteriography
- 4- renal biopsy
- 5- retrograde pyelography

Answer & Comments

Answer: 4- renal biopsy

The presence of long standing hypertension, haematuria, significant, non, nephrotic proteinuria is highly suspicious of glomerular pathology, such as IgA nephropathy which is best characterised by a renal biopsy. In the absence of obstruction on ultrasound,

intravenous urography, retrograde pyelography, and isotope renography are not appropriate. Renal size asymmetry in the presence of hypertension and renal impairment might prompt the search for renovascular disease. However, in this case of kidneys are of similar and good size.



[Q: 1156] OnExamination - Nephrology

A 30-year-old male presents with oedema and proteinuria. On examination his blood pressure was 120/70 mmHg. Investigations reveal:

Creatinine 88 umol/L (60-110)

Albumin 25 g/L (37-49)

Urinalysis no blood

protein ++++

Urinary protein excretion 7g/24hr (<0.2)

Ultrasound of renal tract normal right kidney, absent left kidney

Which is the most appropriate course of action for this patient?

- 1- Albumin transfusion
- 2- Angiotensin converting enzyme inhibitor therapy
- 3- High protein diet
- 4- Renal biopsy
- 5- Trial of steroid therapy

Answer & Comments

Answer: 5- Trial of steroid therapy

This patient has Nephrotic syndrome, which is a combination of:

- " Proteinuria (usually > 3g/24 hrs)
- " Hypoalbuminaemia (<35g/L)
- " Oedema
- " Hyperlipidaemia

The most appropriate course of action here would be to undergo a trial of steroid therapy. Ideally a renal biopsy would be indicated to determine the cause of the nephrotic syndrome, however as this patient only has 1 kidney then this would be considered a relative contraindication for such a procedure. A high protein diet / albumin transfusion would be of little to no benefit - and the latter would need to be salt poor. ACE - inhibitors reduce proteinuria and slow deterioration in GFR. In this case given the patients age he may well have minimal change GN (commonest in children) - which is normally steroid responsive. In the young adult histological diagnoses are in general: Minimal change > Mesangiocapillary > FSGS > Lupus > Membranous > Diabetes. In general steroids are tried first and then 2nd line agents such as cyclosporin and cyclophosphamide are introduced if needed.



[Q: 1157] OnExamination - Nephrology

A 49-year-old woman has been an inpatient for the past 10 days for treatment of a bronchopneumonia. She has developed the onset of chills, fever, and skin rash over the past two days. A peripheral blood film reveals eosinophilia. On urinalysis she has ++ proteinuria. There is no past history of renal disease. Her hemoglobin A1C is normal.

These findings would most strongly suggest which of the following diagnoses?

- 1- Acute serum sickness
- 2- Acute tubular necrosis
- 3- Drug-induced interstitial nephritis
- 4- IgA nephropathy
- 5- Post-streptococcal glomerulonephritis

Answer & Comments

Answer: 3- Drug-induced interstitial nephritis

The findings are typical of a drug-induced acute interstitial nephritis. Post-streptococcal GN appears weeks after the acute infection. Berger's disease (IgA nephropathy) is characterized by hematuria and often follows a 'flu-like' illness. Eosinophilia is not typical for serum sickness.



[Q: 1158] OnExamination - Nephrology

A 45-year-old man on regular haemodialysis complained of weakness and exertional fatigue. On examination, his blood pressure was 170/105 mmHg (pre-dialysis) and 160/95 mmHg (post-dialysis). Investigations pre-dialysis revealed:

Haemoglobin 9.0g/dl
 serum potassium 6.9
 serum creatinine 1250
 serum corrected calcium 2.1 mmol/l

Which intervention is most likely to improve his symptoms:

- 1- increase haemoglobin with epoetin
- 2- increase the length of each dialysis session
- 3- lower the potassium in the dialysate
- 4- improve blood pressure control with ramipril
- 5- correct hypocalcaemia with alfacalcidol

Answer & Comments

Answer: 1- increase haemoglobin with epoetin

This is a tough question with many possible answers. But and importantly, this question asks: how to improve his symptoms! Changing the question round such as how to improve blood pressure or how to improve prognosis alters the answer.

There are several deficiencies in the management of this patient with end stage renal failure. The symptoms described are more in keeping with his anaemia. A mild

hypocalcaemia and hyperkalaemia would not give rise to his symptoms. This also applies to his uncontrolled hypertension. His predialysis creatinine implies he is underdialysed but would not give rise to exertional fatigue. Bearing in mind all the above, the question specifically asks what intervention would improve his symptoms. In which case one would have to elect EPO irrespective of blood pressure, calcium etc.



[Q: 1159] OnExamination -
Nephrology

Which one of the following statements is correct?

- 1- adult polycystic renal disease is inherited as an autosomal recessive trait
- 2- reflux nephropathy is inherited as an autosomal recessive trait
- 3- nephrogenic diabetes insipidus is inherited as an autosomal dominant trait
- 4- Alport's syndrome affects females more severely than males
- 5- medullary sponge kidney is typically not inherited but is a congenital condition.

Answer & Comments

Answer: 5- medullary sponge kidney is typically not inherited but is a congenital condition.

PKD is usually autosomal dominant although the infantile form is autosomal recessive. Nephrogenic DI is usually X-linked. Features of Alport syndrome (hereditary nephritis, haematuria, progressive renal failure and high-frequency nerve deafness) are usually more marked in males. Neither reflux nephropathy nor medullary sponge kidneys are hereditary conditions.



[Q: 1160] OnExamination -
Nephrology

A 28-year-old man presented with

hypertension. On examination he had palpable kidneys and abdominal ultrasound shows bilaterally enlarged cystic kidneys.

Which one of the following conditions is most likely to be present in this patient?

- 1- Mitral stenosis
- 2- Nail dystrophy
- 3- Polycythaemia
- 4- Short stature
- 5- Testicular atrophy

Answer & Comments

Answer: 3- Polycythaemia

The most likely diagnosis here is adult polycystic kidney disease, which is associated with valvular heart abnormalities, incompetence and aneurysms of the cerebral circulation.

However, it is also associated with excessive Erythropoietin production and polycythaemia



[Q: 1161] OnExamination -
Nephrology

A 32-year-old female is diagnosed with Goodpasture's syndrome.

Which of the following therapies used in conjunction with plasmapheresis and corticosteroids would be expected to improve prognosis associated with the condition?

- 1- Azathioprine
- 2- Cyclosporin
- 3- Cyclophosphamide
- 4- Mycophenolate mofetil
- 5- Tacrolimus

Answer & Comments

Answer: 3- Cyclophosphamide

Studies reveal that without treatment, mortality is as high as 90% in association with

Goodpasture's. However, the prognosis is drastically improved with the removal of antigen through plasmapheresis, immunosuppression with corticosteroids and cyclophosphamide. There are some studies revealing the potential of mycophenolate mofetil but the evidence is rather anecdotal.



[Q: 1162] OnExamination - Nephrology

A 32-year-old male is referred with chronic renal dysfunction and is discovered to have Adult Polycystic Kidney Disease. His blood pressure is consistently 140-150/90 mmHg.

Which of the following antihypertensives is the most appropriate for the management of this man's blood pressure?

- 1- ACE inhibitor
- 2- Betablocker
- 3- Calcium channel blocker
- 4- Diuretic
- 5- Moxonidine

Answer & Comments

Answer: 1- ACE inhibitor

Autosomal dominant APKD-1 is a relatively common disorder accounting for approx 8% of cases of ESRD. "The best drugs for this condition are ACE inhibitors (ie, captopril, enalapril, lisinopril) or angiotensin II receptor antagonist blockers (ie, telmisartan, losartan, irbesartan, candesartan). Calcium channel blockers are not encouraged to be used."

However, although widely used and recommended, there is no evidence that the renin-angiotensin system is affected in the disease.



[Q: 1163] OnExamination - Nephrology

A 25-year-old female is admitted with acute dyspnoea and chest pain. A diagnosis of

pulmonary embolism is confirmed and her investigations reveal urine dipstick protein ++ but no blood, anti-double stranded DNA antibodies of 200 U/mL (0 - 73), with a 24 hour urinary protein concentration of 5g (< 0.2).

Which one of the following diagnoses is most likely to be found on renal biopsy?

- 1- AA amyloid
- 2- Focal segmental glomerulonephritis
- 3- IgA nephropathy
- 4- membranous nephropathy
- 5- minimal change nephropathy

Answer & Comments

Answer: 4- membranous nephropathy

This young woman has thromboembolic disease, the nephrotic syndrome with positive anti-ds DNA antibodies suggests a diagnosis of SLE. Nephrotic syndrome in the absence of hypertension, active urinary sediment, or significant hypocomplementemia suggests membranous nephropathy. The thromboembolic disease may arise due to nephrotic syndrome per se or from an associated antiphospholipid syndrome.



[Q: 1164] OnExamination - Nephrology

A 25-year-old woman who is 20 weeks pregnant is diagnosed with pyelonephritis. She had suffered recurrent urinary infections since childhood and her family history reveals that her mother had a history of hypertension and had been told she had a kidney problem. Examination was normal and Urea and Creatinine were both normal

What is the most likely diagnosis?

- 1- autosomal dominant polycystic kidney disease
- 2- bladder outlet obstruction

- 3- normal physiological urinary stasis of pregnancy
- 4- reflux nephropathy
- 5- renal stone disease

Answer & Comments

Answer: 5- renal stone disease

This lady has had recurrent urinary tract infections since childhood, and now presents with pyelonephritis. Pyelonephritis is an uncommon infection in pregnancy, and requires aggressive treatment with antibiotics. It is associated with preterm labour in 4% and may lead to foetal distress. The answer is not ADPKD (A), as symptoms do not tend to occur before the age of 40. Bladder outlet obstruction (B) should not occur in pregnancy, and would cause hydronephrosis and worsening renal function. Answer C is incorrect, as this should not cause pyelonephritis. Renal stone disease (E) does predispose to developing urinary tract infections, but is less likely than reflux nephropathy. The correct answer is reflux nephropathy (D). This lady has a long history of urinary tract infections, with probable underlying reflux scarring and this would predispose her to developing pyelonephritis in pregnancy.



[Q: 1165] OnExamination - Nephrology

Which of the following is a known risk factor for the development of chronic rejection of kidney transplantation :-

- 1- Age
- 2- Anti-smooth muscle antibodies
- 3- Presence of anti-HLA antibodies
- 4- Smoking
- 5- Toxoplasma infection

Answer & Comments

Answer: 3- Presence of anti-HLA antibodies

Chronic rejection is characterised by fibrosis of normal organ structures. The pathogenesis of chronic rejection is not clear- some prefer the term "chronic allograft dysfunction" since both immunological (antigen-dependent and antigen-independent) and non-immunological factors have been identified.

Cell-mediated and humoral immune mechanisms have been implicated in this form of graft rejection. It has also been suggested that rejection is a response to chronic ischaemia caused by injury to endothelial cells. Proliferation of intimal smooth muscle is observed leading to vascular occlusion. The fact that chronic rejection is rare in transplants between HLA-identical siblings suggests that HLA-antigen dependent immunological factors are important. Risk factors include: number of previous acute rejection episodes, presence of anti-HLA antibodies, anti-endothelial antibodies, CMV infection, dyslipidaemia, hypertension, functional mass of the donor kidney and delayed graft function (a clinical manifestation of ischaemia/reperfusion injury)



[Q: 1166] OnExamination - Nephrology

A 60-year-old man presents with right foot drop, left foot and left hand numbness, fever, malaise, weight loss, polymyalgia and polyarthralgia of approximately one month duration.

On examination, he appears unwell ill, with a temperature of 38.5 C and blood pressure of 180/100 mmHg.

Investigations reveal:

haemoglobin 8.0 g/dL (13-18)

erythrocyte sedimentation rate 100 mm/hr (0-20)

serum creatinine 180 µmol/L (60-100)

Urine analysis blood ++

urine microscopy: white cells and red cell casts

Which one of the following is the most likely diagnosis?

- 1- antiphospholipid syndrome
- 2- giant cell arteritis
- 3- paraneoplastic syndrome
- 4- POEMS syndrome
- 5- polyarteritis nodosa

Answer & Comments

Answer: 5- polyarteritis nodosa

This patient has a mononeuritis multiplex, fever, hypertension, and nephritic renal involvement suggesting a diagnosis of PAN. POEMS is a polyneuropathy, organomegaly, endocrinopathy and Myeloma of which a few features are absent and nephritic syndrome is not a feature.



[Q: 1167] OnExamination - Nephrology

Which of the following is associated with Hyperuricaemia?

- 1- is usually due to an excess purine consumption
- 2- occurs in association with acute lymphoblastic leukaemia
- 3- in primary gout is inherited in an autosomal dominant manner
- 4- can be reduced with low dose aspirin therapy
- 5- can be treated with uricosuric drugs even in renal failure

Answer & Comments

Answer: 2- occurs in association with acute lymphoblastic leukaemia

Hyperuricaemia may be due to increased purine intake, urate production or reduced

urate clearance, and is most commonly due to the latter. Therefore it can occur in association with enhanced cell destruction particularly leukaemias. Primary gout has no obvious mode of inheritance, but familial juvenile gouty nephropathy is an autosomal dominantly inherited disorder. Low dose aspirin may exacerbate gout but high dose aspirin is uricosuric. Many of the uricosuric drugs may be detrimental in renal failure and may not be effective.



[Q: 1168] OnExamination - Nephrology

A 60-year-old man was diagnosed last year with adenocarcinoma of the lung, and a 4 cm mass lesion was treated with a right lower lobectomy. He now has an abdominal CT scan that reveals scattered hepatic mass lesions and hilar lymphadenopathy. For several weeks, he has had increasing malaise.

Urinalysis Protein +++

24 hour urine protein 2.7 g/24hr

serum urea 30 mmol/L (2.5 - 7.5)

serum creatinine 450 µmol/L (60 - 110)

A renal biopsy shows focal deposition of IgG and C3 with a granular pattern.

What is the most likely diagnosis?

- 1- Goodpasture's syndrome
- 2- Membranous glomerulonephritis
- 3- Minimal change glomerulonephritis
- 4- Nodular glomerulosclerosis
- 5- Rapidly progressive glomerulonephritis

Answer & Comments

Answer: 2- Membranous glomerulonephritis

Most cases of membranous GN are idiopathic, but in some patients there is a history of an infection or a malignancy (usually lung) with antigenemia.



[Q: 1169] OnExamination -
Nephrology

A 25-year-old female wishes to start a family but she is concerned as her 50-year-old mother had adult polycystic kidney disease. Examination reveals no specific abnormalities.

Which is the most appropriate screening test for polycystic kidney disease in this woman?

- 1- Genetic linkage analysis
- 2- Intravenous urogram
- 3- Isotope renography
- 4- Renal ultrasound
- 5- Urinalysis

Answer & Comments

Answer: 4- Renal ultrasound

The answer lies between renal ultrasound and genetic linkage analysis. Polycystic kidney disease is an autosomal dominant disorder. Mutations in at least 3 different genes can lead to autosomal dominant polycystic disease (APKD).

" PKD-1 on chromosome 16: 85% of cases: - polycystin 1 is an integral membrane glycoprotein involved in cell / matrix interactions.

" PKD-2 on chromosome 4: 10% of cases: - polycystin 2 which may associate with polycystin 1 through a common signalling pathway.

" A third gene mutation is known but its exact chromosomal location is not.

Diagnosis is made by multiple bilateral renal cysts and a positive family history.

1. Genetic linkage studies: can exclude or make the diagnosis in younger patients. Requires blood from at least 2 affected family members.

2. Ultrasonography: in PKD 1 families, age related diagnostic criteria are used: - 2 cysts in < 30 years age group.

3. At least 2 cysts in each kidney in 30 - 59 years. 4 cysts in each kidney for > 60 years.

4. CT: more sensitive than USS and may aid in diagnosis in younger patients.

5. MR Angiography: in patients with a FHx of intracranial aneurysm - to screen for cerebral aneurysms.



[Q: 1170] OnExamination -
Nephrology

A 65-year-old man presents with renal colic. The following day he passes a stone in his urine with analysis revealing that it is composed of uric acid.

Which one of the following is the most likely cause of this type of renal stone?

- 1- Allopurinol
- 2- chronic renal failure
- 3- Primary hyperparathyroidism
- 4- thiazide diuretics
- 5- secondary polycythaemia

Answer & Comments

Answer: 4- thiazide diuretics

Uric acid stones occur in 5-25% of all cases of nephrolithiasis. They are associated with hyperuricaemia and hyperuricosuria. Predisposing factors for uric acid stone formation are dehydration, high purine load (high protein diet), as a primary factor in idiopathic gout, and associated with high cell turnover (e.g. haematological malignancy). Chronic renal failure (B) is incorrect, as there is hyperuricaemia without hyperuricosuria. Hyperparathyroidism (C) is associated with calcium stones, not uric acid stones. Primary polycythaemia would predispose to uric acid stone formation, whereas secondary

polycythaemia (E) does not. Allopurinol (A) is prescribed to treat gout and prevents uric acid formation; hence it reduces the frequency of uric acid stones. The correct answer is thiazide diuretics (D). Thiazide diuretics cause hyperuricaemia and can predispose to hyperuricosuria and uric acid stone formation. Uric acid stones are also associated with underlying hypertension. Thiazide diuretics are used to treat calcium stones, as they increase the reabsorption of calcium from the proximal tubules, preventing hypercalciuria.



[Q: 1171] OnExamination - Nephrology

A 52-year-old man has been referred to the renal clinic due to deteriorating renal function. A diagnosis of adult polycystic kidney disease is made. His family history reveals that his mother died of a stroke at the age of 50 and his father is still alive.

He is concerned regarding the inheritance of the disorder and wishes to know what the risk to his son is of inheriting this disorder?

- 1- 0%
- 2- 25%
- 3- 50%
- 4- 75%
- 5- 100%

Answer & Comments

Answer: 3- 50%

APKD is autosomal dominant condition and typically presents between the ages of 30-50. Patients develop deteriorating renal function and associated hypertension. As well as renal cysts they may also have hepatic and berry aneurysms (maternal history may be highly relevant here). The chances of passing this condition to his son is 50%.



[Q: 1172] OnExamination - Nephrology

A 70-year-old man is admitted to hospital complaining of a twelve-day history of loin pain, fevers and occasional rigors. On examination, his temperature is 37.9°. The renal function is normal. Urinalysis of a mid stream urine shows: No organisms seen, with no growth

White Cell Count $>100 /\text{mm}^3$

Red Cell Count $> 50 /\text{mm}^3$

Which would be your first investigation of choice?

- 1- CT abdomen and pelvis
- 2- Intra Venous Urogram (IVU)
- 3- Ultrasound scan renal tract
- 4- Transthoracic echocardiogram
- 5- Prostatic Specific Antigen (PSA) measurement

Answer & Comments

Answer: 3- Ultrasound scan renal tract

Renal cell carcinomas may present in a variety of ways, with only a minority being diagnosed with the classical triad of haematuria, loin pain and a palpable mass. Relatively common presentations include anaemia, hypertension, pyrexia of unknown origin, fatigue and increased plasma viscosity. Less common presentations include hypercalcaemia, polycythaemia, liver dysfunction, enteropathy or myopathy. Urinalysis may show sterile pyuria, as here. Other causes of sterile pyuria are partially treated UTI, TB of the renal tract, urethritis and sexually transmitted diseases, acute glomerulo-nephritis, tubulo-interstitial diseases, adult polycystic kidney disease, and renal stones. Ultrasound scan of the renal tract would be the first investigation of choice, as it is able to pick up 95% of renal cell carcinomas $>1\text{cm}$ in diameter. It would also exclude infective or inflammatory collections within the renal tract. If required a CT +/-

guided biopsy could be obtained to prove the diagnosis. An IVU was considered the investigation of choice before the advent of ultrasound. A chest x-ray and bone scan would be required to complete the basic investigations.



[Q: 1173] OnExamination -
Nephrology

A 62-year-old man with a longstanding history of hypertension is seen in the outpatient clinic.

Investigations:

Creatinine 280 $\mu\text{mol/L}$

Urinalysis

Blood ++

Protein 1.8 g/L

Ultrasound scan of kidneys Left kidney 8.5 cm;
right kidney 8.9cm

What is the best investigation to diagnose the cause of his renal impairment?

- 1- Intravenous urogram (IVU)
- 2- Isotope renogram
- 3- Renal angiogram
- 4- Renal biopsy
- 5- Retrograde pyelogram

Answer & Comments

Answer: 4- Renal biopsy

This patient has a long history of hypertension; therefore it should have been appropriately controlled in the clinic.

The patient now presents with bilaterally shrunken kidneys, renal impairment and evidence of a glomerulonephritis.

In the presence of mild to moderate hypertension, proteinuria indicates either underlying renal disease or renovascular disease.

As this patient has blood and protein in the urine, on the background of impaired renal function and shrunken kidneys, the best investigation would be to perform a renal biopsy (assuming the hypertension was controlled). This would differentiate between renovascular disease and glomerulonephritis, which may be reversible.

If this patient had the above clinical findings without blood and protein in the urine, then the investigation of choice would be a renal angiogram, to diagnose renovascular disease.



[Q: 1174] OnExamination -
Nephrology

A 15-year-old girl was seen by her family physician because of increasing lethargy. She had a recent history of the "flu". Biochemistry tests show that she has renal impairment.

serum sodium 140 mmol/L (137 - 144)

serum potassium 4.2 mmol/L (3.5 - 4.9)

serum urea 28 mmol/L (2.5 - 7.5)

serum creatinine 280 $\mu\text{mol/L}$ (60 - 110)

Her condition does not improve after several weeks on corticosteroid therapy, so a renal biopsy is performed. The biopsy demonstrates the presence of segmental sclerosis of 3 of 10 glomeruli identified in the biopsy specimen. Immunofluorescence studies and electron microscopy do not reveal evidence for immune deposits.

What is the most appropriate advice to give regarding her condition?

- 1- She has an underlying malignancy
- 2- She may require a renal transplant in 10 years
- 3- She will improve if she loses weight
- 4- She will likely develop a restrictive lung disease
- 5- She will probably improve with additional corticosteroid therapy

Answer & Comments

Answer: 2- She may require a renal transplant in 10 years

The findings point to focal segmental glomerulosclerosis (FSGS), which leads to chronic renal failure in half of cases. The lack of resolution with corticosteroid therapy and the progression to chronic renal failure is what sets FSGS apart from minimal change disease.



[Q: 1175] OnExamination - Nephrology

A 55-year-old man who has received haemodialysis for many years presents with deteriorating discomfort in both shoulders. Past medical history included bilateral carpal tunnel decompression. His Investigations reveal:

haemoglobin 10 g/dl

ESR 30 mm/1st hr (1-10)

C-reactive protein 12mg/L (1-10)

Urate 0.58 mmol/L (less than 0.45)

What is the most likely diagnosis?

- 1- b2 microglobulin amyloidosis
- 2- gout
- 3- Pseudogout
- 4- Polymyalgia rheumatica
- 5- Osteoarthritis

Answer & Comments

Answer: 1- b2 microglobulin amyloidosis

The features of shoulder pain associated with a past history of carpal tunnel syndrome in a patient receiving haemodialysis suggests a diagnosis of b2 microglobulin amyloidosis. Amyloid deposits composed of b2-microglobulin as the major constituent protein are mainly localized in joints and periarticular bone and lead to destructive arthropathy which tends to develop 5 to 10 years after the initiation of dialysis. Death from amyloidosis

of gut and heart may occur after 20 years of dialysis.



[Q: 1176] OnExamination - Nephrology

A 16-year-old girl presented with Henoch-Schölein purpura and renal involvement.

What is the most likely outcome?

- 1- A high probability of relapse
- 2- Complete renal recovery
- 3- Persistent hypertension
- 4- Persistent proteinuria
- 5- Requirement for long-term corticosteroids

Answer & Comments

Answer: 2- Complete renal recovery

Henoch-Schölein Purpura (HSP) is a self-limiting vasculitis which occurs in children and young adults. It is characterized by non-thrombocytopenic purpura, arthralgia, abdominal pain and glomerular nephritis. It is likely to be an immune complex disease - involving IgA, but no treatment has proven efficacy. The disease usually settles between 4-6 weeks without sequelae if kidney involvement is mild. However this condition can occasionally relapse.



[Q: 1177] OnExamination - Nephrology

A 36-year-old male is referred with chronic renal dysfunction and is discovered to have Adult Polycystic Kidney Disease.

Which of the following proteins is associated with the development of APKD?

- 1- Cyst specific binding protein
- 2- Matrix metalloproteinase
- 3- Polycystin-1
- 4- Progesterone binding cyst-protein
- 5- Type 1 collagen

Answer & Comments

Answer: 3- Polycystin-1

Autosomal dominant PKD-1 is a relatively common disorder accounting for approx 8% of cases of ESRD. 85% of cases are due to the defect in PKD-1 locus on Chromosome 16p13.3. PKD-1 encodes a large protein, polycystin, which seems to be involved in cell to cell matrix interaction.



[Q: 1178] OnExamination - Nephrology

Autosomal recessive conditions include:

- 1- Vitamin D resistant rickets
- 2- Huntingdon's chorea
- 3- Wilson's disease
- 4- Manic depression
- 5- Turner's syndrome

Answer & Comments

Answer: 3- Wilson's disease

Vitamin D resistant rickets = X-linked dominant. No linkage has been established for a particular gene in manic depressive disorder.



[Q: 1179] OnExamination - Nephrology

A 17-year-old boy presented with a non-blanching rash over his legs, a swollen knee and painless frank haematuria. Investigations revealed:

Serum creatinine: 210 µmol/L (60-110)

Urine dipstick analysis: blood +++, protein +

Urine culture: negative

Ultrasound of the kidneys: normal

Which glomerular abnormality is most likely to be present at renal biopsy?

- 1- Focal and segmental sclerosis
- 2- Foot process fusion

- 3- Linear deposition of IgG on the basement membrane
- 4- Mesangial deposition of IgA
- 5- Thickening of basement membranes

Answer & Comments

Answer: 4- Mesangial deposition of IgA

The likely diagnosis here is Henoch-Schönlein Purpura (HSP). HSP is an inflammatory disorder of unknown cause characterized by IgA-dominant immune complexes in smaller venules, capillaries and arterioles. It presents with purpura, arthritis (especially ankles and knees), abdominal pains, haematuria and proteinuria.

HSP is often associated with infectious agents such as group A Streptococci and Mycoplasma. If there is progression to renal impairment then renal histopathology may include minimal change to severe glomerulonephritis that is indistinguishable from IgA nephropathy. However, mesangial Ig A deposits are the most typical features of HSP on renal biopsy.



[Q: 1180] OnExamination - Nephrology

A 65-year-old female is referred with a long history of hypertension and episodic urinary tract infections. Dipstick analysis of the urine shows Blood +++ together with protein +++. Her Urea is 20 mmol/l (3-8) and Creatinine 280 micromol/l (60-100). An ultrasound of abdomen is requested and shows left and right kidneys of 9 cm in size (10-12) without evidence of obstruction.

Which one of the following is the best investigation to diagnose the cause of her renal failure?

- 1- isotope renography
- 2- IV urography
- 3- renal angiography

- 4- renal biopsy
5- retrograde pyelography

Answer & Comments

Answer: 4- renal biopsy

This patient has impaired renal function, with hypertension and significant proteinuria and haematuria (? glomerulonephritis). The kidneys are smaller than expected, with no evidence of obstruction. Intravenous urography (B) is not the investigation of choice in a patient with impaired renal function. Isotope renography (A) would provide information about the relative function of each kidney, and would show areas of scarring due to renal stone disease, infection, or vascular disease. It would also exclude congenital malformations of the kidneys. Although useful, it would not provide information on the cause of the haematuria and proteinuria. Renal angiography (C) is the gold standard for assessing renovascular disease. It is an invasive procedure, with potential complications. This investigation would not exclude causes of proteinuria and haematuria. Retrograde pyelography (E) would be useful if there were any evidence of obstruction. The best investigation is a renal biopsy. This would show any changes of glomerulonephritis, along with renal scarring from longstanding hypertension or urinary tract infections.



[Q: 1181] OnExamination - Nephrology

A 72-year-old male presented to his GP with depression after the death of his wife. His notes also reveal that he has a two-year history of urinary hesitancy and poor stream. His GP prescribed him some medication and the following day he developed acute urinary retention.

Which of the following drugs is most likely to have precipitated the urinary retention?

- 1- Amitriptyline
2- Diazepam
3- Fluoxetine
4- Venlafaxine
5- Zopiclone

Answer & Comments

Answer: 1- Amitriptyline

Amitriptyline has anticholinergic effects being associated with tachycardia, dry mouth and urinary retention. These features are not typical of SSRIs such as Venlafaxine and Fluoxetine with urinary retention and dry mouth rarely reported. Diazepam, a benzodiazepine does not have anticholinergic effects. Zopiclone is a benzodiazepine like agent whose side effects include drowsiness.



[Q: 1182] OnExamination - Nephrology

A 25-year-old man developed bilateral loin pain and frank hematuria. His symptoms had started 24 hours after developing a sore throat. His blood pressure was 138/88 mmHg. Urinalysis was positive for blood (4+) and protein (2+).

What is the most likely diagnosis?

- 1- IgA nephropathy
2- microscopic polyangiitis
3- nephrolithiasis
4- post-streptococcal glomerulonephritis
5- septicaemia

Answer & Comments

Answer: 1- IgA nephropathy

The acute onset of the disease is suggestive of IgA nephropathy which characteristically occurs in young males in their 20s and 30s. Haematuria occurs within 12-24 hours of pharyngitis, accompanied also by loin pain,

muscle pain and fever. Prognosis is usually good especially in children. In adults, between 25-50% may develop end-stage renal failure. No specific treatment available. Classically, patient has streptococcal infection 1-3 weeks before the onset of acute nephritic syndrome (post-strep GN). There is a long prodromal systemic illness lasting months or years in microscopic polyangiitis which differs from Wegener's granulomatosis in its absence of respiratory tract granulomatous inflammation.



[Q: 1183] OnExamination -
Nephrology

A 19-year-old female developed pleural effusions, ascites and ankle swelling. Her blood pressure was 112/76 mmHg.

Investigations revealed:

serum alanine transferase 17 U/L (5 - 15)

serum total bilirubin 17 umol/L (1 - 22)

serum albumin 21 g/L (34 - 94)

serum total cholesterol 9.8 mmol/L (<5.2)

What is the next most appropriate investigation?

- 1- Antinuclear antibody
- 2- Pregnancy test
- 3- Prothrombin time
- 4- Serum protein electrophoresis
- 5- Urinary protein estimation

Answer & Comments

Answer: 5- Urinary protein estimation

The low albumin and elevated cholesterol would suggest nephrotic syndrome (>4gram protein/24hour urine). Other complications of nephritic syndrome include susceptibility to infection, thromboses, renal failure and protein malnutrition. The normal BP makes preeclampsia unlikely. Besides, the hypercholesterolaemia is the big clue.



[Q: 1184] OnExamination -
Nephrology

A 63-year-old woman presents following a visit to the well woman clinic where she is noted to be hypertensive. She has a past history of hip osteoarthritis for which she has taken regular paracetamol. On examination she is obese with a BMI of 35 (< 25), has a blood pressure of 180/100 mmHg and glycosuria is noted.

Her Investigations show:

Fasting plasma glucose 18.3 mmol/L

Serum urea 9.8 mmol/l

serum creatinine 129 micromol/L

24 hour urine protein concentration 1.8 g/d

Normal ultrasonic appearances of both kidneys

Which of the following is the most likely diagnosis?

- 1- Analgesic nephropathy
- 2- Chronic glomerulonephritis
- 3- Diabetic nephropathy
- 4- Hypertensive nephropathy
- 5- Ischaemic nephropathy

Answer & Comments

Answer: 3- Diabetic nephropathy

This patient is diabetic and has proteinuria. Although diabetic nephropathy usually takes 5 or more years to evolve, this patient is likely to have had the condition for many years prior to it now being diagnosed. Ischaemic nephropathy, due to renal artery stenosis is unlikely in the presence of a normal renal ultrasound. Analgesic nephropathy would be a consequence of NSAIDs not paracetamol. Hypertensive nephropathy is a possibility but is less likely in the context of her proteinuria and moderately elevated BP.



[Q: 1185] OnExamination -
Nephrology

A 68-year-old male diagnosed with nephrotic syndrome receives steroid therapy without benefit. His investigations show an albumin of 20 g/L (37 - 49), Total cholesterol of 12 mmol/L, dipstick urinalysis reveals +++ protein and a renal biopsy shows focal segmental glomerulosclerosis.

Which one of the following is most likely to preserve renal function?

- 1- dietary salt restriction
- 2- low dietary protein intake
- 3- ramipril
- 4- simvastatin
- 5- warfarin

Answer & Comments

Answer: 3- ramipril

Approximately 50% of subjects with FSGS do not respond to steroid therapy but ACE inhibitors are a recognized strategy to slow the progression of renal disease. This patient is clearly at high risk of cardiovascular disease with a very high cholesterol but the question specifically asks about renal disease.



[Q: 1186] OnExamination -
Nephrology

What is the most likely outcome of minimal change nephropathy with onset at 12 year of age?

- 1- frequent relapse
- 2- full renal recovery
- 3- permanent renal impairment
- 4- persistent hypertension
- 5- persistent proteinuria

Answer & Comments

Answer: 2- full renal recovery

30-40% of children achieve spontaneous remission and 90% achieve remission following 8 weeks treatment with high dose steroids. However in adults only around 50% achieve remission.



[Q: 1187] OnExamination -
Nephrology

In which of the following situations would a percutaneous needle biopsy of the kidney be most helpful and appropriate?

- 1- Fever with suspected acute pyelonephritis
- 2- Premature neonate with suspected polycystic kidney disease
- 3- Prostatic hyperplasia with suspected hydronephrosis
- 4- Suspected renal cyst
- 5- Systemic lupus erythematosus and acute renal failure

Answer & Comments

Answer: 5- Systemic lupus erythematosus and acute renal failure

Therapy may depend upon determination of the severity and nature of the renal disease with SLE. The presence of young age (<23 years) increased serum creatinine level, diffuse proliferative lesions (WHO classification class IV) and a high chronicity index on renal histologic analysis are associated with a poorer prognosis and risk of renal failure.

" Class I - Shows little or no changes. No treatment is necessary.

" Class II - Some mesangial lesions. If it is IIa, no treatment is necessary, but the patient needs to be monitored (by urine and blood tests). If IIb exists, especially in the presence of high anti-ds DNA, low complement, and over a gram of protein in the urine, then therapy needs to be initiated (usually prednisone).

" Class III & Class IV - These stages progress to endstage renal failure in about 50% of the cases, so aggressive therapy is warranted. Treatment ranges from prednisone to IV cytotoxic drugs.

" Class V - Membranous lesions are usually treated with prednisone. Cytotoxic drugs are not *usually* effective, unless there is concurrent evidence of classes III or IV.



[Q: 1188] OnExamination - Nephrology

Acute renal failure may be distinguished from chronic renal failure by which of the following?

- 1- an increased urinary Na excretion
- 2- left ventricular hypertrophy on the ECG
- 3- hypophosphataemia
- 4- renal size on ultrasound scan
- 5- hyperkalaemia

Answer & Comments

Answer: 4- renal size on ultrasound scan

Small kidneys on USS suggest chronic renal failure but the following causes of chronic renal failure can present with normal / enlarged kidneys - amyloidosis, polycystic kidney disease, diabetic glomerulosclerosis, scleroderma and rapidly progressive glomerulonephritis.

Decreased fractional Na clearance, hyperphosphataemia and hyperkalaemia are features of acute or chronic renal failure.

LVH is probably more likely to be seen in chronic renal failure but is not reliable.



[Q: 1189] OnExamination - Nephrology

A 55-year-old man who has received haemodialysis for many years presents with deteriorating discomfort in both shoulders. Past medical history included bilateral carpal

tunnel decompression. His Investigations reveal:

haemoglobin 10 g/dl

ESR 30 mm/1st hr (1-10)

C-reactive protein 12mg/L (1-10)

Urate 0.58 mmol/L (less than 0.45)

What is the most likely diagnosis?

- 1- b2 microglobulin amyloidosis
- 2- Gout
- 3- Pseudogout
- 4- Polymyalgia rheumatica
- 5- Osteoarthritis

Answer & Comments

Answer: 1- b2 microglobulin amyloidosis

The features of shoulder pain associated with a past history of carpal tunnel syndrome in a patient receiving haemodialysis suggests a diagnosis of b2 microglobulin amyloidosis. Amyloid deposits composed of b2-microglobulin as the major constituent protein are mainly localized in joints and periarticular bone and lead to destructive arthropathy which tends to develop 5 to 10 years after the initiation of dialysis. Death from amyloidosis of gut and heart may occur after 20 years of dialysis.



[Q: 1190] OnExamination - Nephrology

A 54-year-old man with intermittent claudication was found to have renal impairment. Investigations revealed:

Serum creatinine: 180 umol/L (60-100)

Urinalysis: Protein++

Renal ultrasound revealed a right kidney of 7 cms and a left kidney of 10cms (normal dimensions 10-14cm)

Which investigation should be requested to establish the diagnosis?

- 1- Cystoscopy
- 2- Intravenous urography
- 3- Isotope renography
- 4- Renal arteriography
- 5- Renal biopsy

Answer & Comments

Answer: 4- Renal arteriography

This patient has renovascular disease with a left renal artery stenosis. The gold standard for establishing the diagnosis of renal artery stenosis is renal arteriography and this is commonly performed with magnetic resonance angiography. In 1/3 of cases the disease is bilateral; 40% may have peripheral vascular disease and there may be proteinuria.



[Q: 1191] OnExamination - Nephrology

An 81-year-old man was admitted with renal failure due to benign prostatic hypertrophy. His bladder was drained with a urethral catheter followed by a diuresis of > 3L per day. After two days he became progressively drowsy.

What is the most likely cause for his reduced level of consciousness?

- 1- hyponatraemia
- 2- hypocalcaemia
- 3- hypomagnesaemia
- 4- hyperglycaemia
- 5- metabolic acidosis

Answer & Comments

Answer: 1- hyponatraemia

Amelioration of urinary obstruction and subsequent recovery initially results in a large electrolyte and water loss. Osmotic cerebral changes precipitated by urinary sodium loss,

the major intravascular cation, is the cause of drowsiness. Hypocalcaemia and hypomagnesaemia may occur as tubular reabsorption is suboptimal in the early stages of recovery, but is unlikely to affect conscious level. Acid-base status should improve after relief of the obstruction. Hyperglycaemia is not a common complication of recovery from obstructive uropathy.



[Q: 1192] OnExamination - Nephrology

A 45-year-old male presents with a long-standing history of hypertension. Investigations show a urea of 10.2 mmol/l and a Creatinine of 150 micromol/l (50-100).

Which one of the following would suggest a diagnosis of acute glomerulonephritis?

- 1- 24 hour urinary protein excretion of 0.8g
- 2- Dyslipidaemia
- 3- RBC casts in urinary sediment
- 4- Shrunken glomeruli on renal biopsy
- 5- Unilaterally smaller kidney

Answer & Comments

Answer: 3- RBC casts in urinary sediment

Casts containing erythrocytes (red cell casts) are an indication of renal bleeding, and are typically found when there is acute glomerular inflammation caused by glomerulonephritis or vasculitis. Answers A, B, D, and E are non specific and do not suggest an acute glomerulonephritis.



[Q: 1193] OnExamination - Nephrology

A 46-year-old woman develops nephrotic syndrome and is awaiting further tests to establish the underlying aetiology.

In which circumstance would corticosteroids be most effective in reversing the nephrotic syndrome?

- 1- Membranous nephropathy
- 2- Minimal change disease
- 3- Primary amyloidosis
- 4- Renal vein thrombosis
- 5- Mesangial IgA disease

Answer & Comments

Answer: 2- Minimal change disease

Although there is no known effective treatment for IgA nephropathy, there have been reports of favourable response to long term corticosteroid therapy. 80% adults with minimal change GN will respond to steroids, although remissions can take up to 16 weeks. Membranous GN does not respond to steroid treatment. No specific treatment is available to cause regression of amyloid deposits.



[Q: 1194] OnExamination -
Nephrology

A 33-year-old male is receiving regular haemodialysis is noted to have a plasma potassium of 6.9 mmol/L (3.5-4.9) before a dialysis session. Although normally his potassium is less than 5.5 mmol/L.

Which food combination from the dietary history would be most likely to cause the high potassium concentration?

- 1- Cereal, toast, biscuits.
- 2- Filter coffee, tea, boiled potatoes.
- 3- Milk, butter, plain yoghurt
- 4- Milk, ham, chicken.
- 5- Tomato, potato crisps, banana.

Answer & Comments

Answer: 5- Tomato, potato crisps, banana.

In particular tomato and banana have high potassium content and patients should be advised to avoid such foods.



[Q: 1195] OnExamination - Clinical pharmacology

A 67-year-old man who has a long history of chronic bronchitis is admitted from home with an acute exacerbation.

Investigations show:

pCO₂ 82 mmHg (35-45)

pO₂ 50 mmHg (90 - 110)

Which of the following would be expected in this patient?

- 1- A metabolic acidosis with a low bicarbonate would be expected
- 2- Extensor plantar responses may be expected
- 3- Gentamicin would be a reasonable initial treatment until cultures are available
- 4- Oxygen therapy should aim to increase the pO₂ to above 60mmHg (8kPa)
- 5- Peripheral oedema indicates coexisting heart failure

Answer & Comments

Answer: 2- Extensor plantar responses may be expected

In chronic bronchitis, a low pO₂ with high pCO₂ and compensated respiratory acidosis with high bicarbonate is expected. Consequently with the high pCO₂ an encephalopathy may be precipitated resulting in extensor plantar responses. The figures given suggest a respiratory acidosis.

BTS guidelines would recommend treatment of exacerbations with amoxicillin or cephalosporin

Oxygen therapy should be given cautiously aiming to maintain a pCO₂ between 50-60mmHg (see Harrisons - Principles of Internal Medicine), this is debateable but the point is that the aim should not be a normal pO₂ but rather a sufficient pO₂ particularly in 'blue bloaters' (type II respiratory failure). Extensor

plantar responses are a feature often reflecting high pCO₂

There may be a dependent (postural) oedema and does not necessarily indicate heart failure.



[Q: 1196] OnExamination - Clinical pharmacology

A 65-year-old man presented with chest pain and was found to have ST elevation in leads II, III and aVF. He was thrombolysed and has been stable on coronary care.

On the third day of admission he becomes confused and on reviewing the history it becomes apparent that he was a heavy alcohol drinker before admission taking 80 units of alcohol per week.

Which of the following management options would be most helpful in this situation?

- 1- CT brain scan
- 2- Diazepam
- 3- Haloperidol
- 4- Psychiatric referral
- 5- Thiamine

Answer & Comments

Answer: 2- Diazepam

This man is withdrawing from alcohol and this is associated with anxiety and tachycardia which is the last thing that someone who has just had an MI should suffer from. Also there is a risk of seizure. Benzodiazepines are the first line of treatment for withdrawal. Thiamine is also indicated in chronic alcoholism but is not as immediately important as diazepam. A psychiatric referral may be necessary if his symptoms prove difficult to control but usually the psychiatry team would not be keen to intervene in what is really a medical emergency; they often advise on other strategies for sedation however. This is unlikely to be an intracerebral bleed from thrombolysis on the third day but

a CT scan may be indicated if there are focal neurological signs. Haloperidol is best avoided because of the risk of causing hypotension.



[Q: 1197] OnExamination - Clinical pharmacology

A 17-year-old boy is admitted with a severe paracetamol overdose following an argument with his girlfriend. He is treated with intravenous N-acetylcysteine. Paracetamol is normally metabolised to harmless compounds except in overdose.

Which of the following compounds is the toxic metabolite that accumulates during paracetamol overdose and is reduced by treatment with N-acetylcysteine?

- 1- Glucuronide
- 2- Homocysteine
- 3- Methionine
- 4- N-acetyl-p-benzoquinoneimine
- 5- N-hydroxyacetaminophen

Answer & Comments

Answer: 4- N-acetyl-p-benzoquinoneimine

Paracetamol is predominantly metabolised to glucuronide and sulphate conjugates, which are excreted in the urine. Hepatotoxicity is related to the conversion of a small proportion of the ingested dose to N-acetyl-p-benzoquinoneimine. In therapeutic doses N-acetyl-p-benzoquinoneimine is detoxified by conjugation with glutathione in the liver, but once the protective intracellular glutathione stores are depleted hepatic and renal damage may ensue. NAC and Methionine replenishes glutathione stores in the liver and may also act through its Sulphydryl (-SH) group as a direct reducing agent.



[Q: 1198] OnExamination - Clinical pharmacology

In a trial of a new drug, 13/28 treated

improved over a one month period, compared with 3/28 on placebo.

For Chi² testing which of the following is correct?

- 1- The figures should first be converted to percentages.
- 2- The results would almost certainly suggest that more cases were needed to obtain a significant result.
- 3- There is one degree of freedom.
- 4- A value of Chi² of 4.6 would imply that the result would have been obtained by chance in 46/100 trials.
- 5- The results would be invalidated if a disproportionate number of cases treated with the new drug had developed side effects.

Answer & Comments

Answer: 3- There is one degree of freedom.

Chi² testing refers to count data (categorical). It therefore refers to 2 by 2 tables or larger. The test statistic is defined by:

$$\text{Chi}^2 = \frac{\sum (\text{observed} - \text{expected})^2}{\text{expected}}$$

The degrees of freedom equal (rows -1) x (Columns -1). Significance can be looked up using the Chi² distribution according to the appropriate number of degrees of freedom.



[Q: 1199] OnExamination - Clinical pharmacology

A 71-year-old male with a history of chronic renal impairment and atrial fibrillation for which he takes warfarin, presents with an acutely tender and red left big toe.

Investigations reveal:

Serum Creatinine 200 micromol/l (50-100)

Serum Urate 0.5 mmol/l (0.12-0.42)

Which of the following is the most appropriate treatment for this man's presentation?

- 1- Allopurinol
- 2- Colchicine
- 3- Diclofenac
- 4- Paracetamol
- 5- Prednisolone

Answer & Comments

Answer: 5- Prednisolone

This man presents with acute gout, has chronic renal impairment, AF and takes warfarin. NSAIDs would be the treatment of choice but may cause both a deterioration in renal function and INR. Similar reasons would obviate the use of Colchicine. Thus, Steroids are probably the best option. Allopurinol may well precipitate/exacerbate acute gout and are used once the acute attack has settled following adequate treatment.



[Q: 1200] OnExamination - Clinical pharmacology

A 40-year-old lady presents with a swollen right calf. She has a history of mental health problems and is on a number of medications.

Which of the following treatments increases the risk of thromboembolism?

- 1- Antipsychotics
- 2- Benzodiazepines
- 3- Monoamine oxidase inhibitors
- 4- Selective serotonin reuptake inhibitors
- 5- Tricyclic antidepressants

Answer & Comments

Answer: 1- Antipsychotics

The oral contraceptive and antipsychotics are possible causes of thromboembolism.



[Q: 1201] OnExamination - Clinical pharmacology

A 50-year-old lady is brought into the

Emergency department with drowsiness following an overdose of amitriptyline. She has dilated pupils, a GCS of 12, pulse 140 bpm, BP 85/60 and her ECG shows a wide complex tachycardia.

Which of the following is the most appropriate next step in management?

- 1- Carotid sinus massage
- 2- DC cardioversion
- 3- IV bicarbonate
- 4- IV magnesium
- 5- Refer for haemodialysis

Answer & Comments

Answer: 3- IV bicarbonate

This lady has a significant tricyclic overdose and the ventricular dysrhythmias can be very difficult to control. Management with IV bicarbonate is indicated.

"The use of sodium bicarbonate in tricyclic poisoning has been shown to have beneficial effects. ... In a review of 91 patients treated with sodium bicarbonate, hypotension was corrected in 20 of 21 patients (96%) within one hour and QRS prolongation was corrected in 39 of 49 patients (80%). ... The mechanism of this effect is a subject of debate."



[Q: 1202] OnExamination - Clinical pharmacology

A 70-year-old woman is on multiple medications for various conditions and she is found to have a macrocytic anaemia with a low serum B12.

Which of the following medications is a possible cause of the B12 deficiency?

- 1- Amiodarone
- 2- Ezetimibe
- 3- Metformin
- 4- Nicotinic acid

5- Sodium valproate

Answer & Comments

Answer: 3- Metformin

Metformin can lead to reduced B12 absorption but this is not usually a clinical problem.

"The clinician must be aware of the possibility of metformin-associated B12 deficiency in users who suffer cognitive impairment, peripheral neuropathy, subacute combined degeneration of the cord or anaemia."



[Q: 1203] OnExamination - Clinical pharmacology

A 35-year-old man with a known history of acute intermittent porphyria because he carries a medical emergency card is brought to the emergency department by the police; he has been violent with acute psychosis.

Which of the following sedatives would be the safest to use in this circumstance?

- 1- Chloral hydrate
- 2- Chlorpromazine
- 3- Diazepam
- 4- Haloperidol
- 5- Phenobarbitone

Answer & Comments

Answer: 2- Chlorpromazine

Phenothiazines have antiemetic and antipsychotic properties, making them the medication of choice for acute porphyria episodes.



[Q: 1204] OnExamination - Clinical pharmacology

Phenytoin:

- 1- Is associated with red-green colour blindness

- 2- Toxicity is associated with orchitis

- 3- A steady state blood level is achieved by 2-5 days

- 4- Can be used in management of alcohol withdrawal syndrome

- 5- Is the drug of choice in absence seizures.

Answer & Comments

Answer: 4- Can be used in management of alcohol withdrawal syndrome

Phenytoin is an imidazolidine derivative. It relates to barbiturates in chemical structure. Clinically effective serum level is in the range on 10-20 micrograms/ml. A steady state blood level is achieved by 7-10 days.



[Q: 1205] OnExamination - Clinical pharmacology

A 52-year-old woman takes Lithium Carbonate for manic depression and also takes Codeine and Diclofenac prescribed by her GP for osteoarthritis.

Which one of the following statements is correct?

- 1- Codeine will reduce the bioavailability of Lithium
- 2- The analgesic effect of Codeine will be reduced by co-administration of Diclofenac
- 3- The nephrotoxicity of Diclofenac will be increased in this patient
- 4- Plasma Lithium concentration will be increased by Codeine
- 5- Plasma Lithium concentrations will be raised by Diclofenac

Answer & Comments

Answer: 5- Plasma Lithium concentrations will be raised by Diclofenac

Diclofenac decreases renal Lithium clearance and increases Lithium concentrations. Codeine and diclofenac are frequently co-prescribed.



[Q: 1206] OnExamination - Clinical pharmacology

A patient is suspected of having taken a substance with anticholinesterase effects.

Which of the following combinations of signs, if present, would be the most likely to confirm this effect?

- 1- Bradycardia and miosis
- 2- Bradycardia and mydriasis
- 3- Bradycardia and urinary retention
- 4- Tachycardia and diarrhoea
- 5- Tachycardia and lacrimation

Answer & Comments

Answer: 1- Bradycardia and miosis

An Acetylcholinesterase inhibitor or Anti-cholinesterase is a chemical that inhibits the cholinesterase enzyme from breaking down acetylcholine (ACh), so increasing both the level and duration of action of the neurotransmitter acetylcholine. ACh can stimulate postganglionic receptors to produce effects such as salivation, lacrimation, defecation, micturition, sweating, miosis, bradycardia, and bronchospasm. Muscarine produces these effects, and hence they are referred to as muscarinic effects, and the postganglionic receptors are called muscarine receptors.

SLUD (Salivation, Lacrimation, Urination, Defecation [and emesis]) is a syndrome of pathological effects indicative of massive discharge of the parasympathetic nervous system. Unlikely to occur naturally, SLUD is usually encountered only in cases of drug overdose or exposure to nerve gases. Nerve gases irreversibly inhibit the enzyme acetylcholinesterase; this results in a chronically high level of acetylcholine at cholinergic synapses throughout the body, thus chronically stimulating acetylcholine receptors throughout the body.



[Q: 1207] OnExamination - Clinical pharmacology

Which of the following mechanisms best explains the action of fibrates?

- 1- Activation of PPAR-alpha
- 2- Bile acid sequestration
- 3- Decreases hepatic cholesterol synthesis
- 4- Increases peroxisomal beta-oxidation of fatty acids
- 5- Inhibits cholesterol absorption

Answer & Comments

Answer: 1- Activation of PPAR-alpha

The effect of fibrates on the metabolism of triglyceride-rich lipoproteins is due to a PPAR-alpha-dependent stimulation of lipoprotein lipase and of apolipoprotein (apo)A-V and to an inhibition of apoC-III expression, whereas the increase in plasma HDL-cholesterol depends partly on an overexpression of apoA-I and apoA-II.



[Q: 1208] OnExamination - Clinical pharmacology

Which term best describes the affinity of a drug for its receptor?

- 1- Efficacy
- 2- Intrinsic activity
- 3- Potency
- 4- Selectivity
- 5- Therapeutic effect

Answer & Comments

Answer: 3- Potency

Affinity is the measure of the net molecular attraction between a drug (or neurotransmitter or hormone) and its receptor. The receptor's affinity for binding a drug determines the concentration of drug required to form a significant number of drug-

receptor complexes. Affinity and intrinsic activity are determinants of potency. Efficacy contributes both to potency and to the maximum effect of the agonist. Efficacy is a measure of the efficiency of the drug-receptor complex in initiating the signal transduction process.



[Q: 1209] OnExamination - Clinical pharmacology

Which of the following statements regarding Antabuse (Disulfiram) are correct?

- 1- Can be used to assist abstinence from alcohol in patients with heart disease.
- 2- Antabuse acts by promoting the metabolism of acetaldehyde
- 3- Patients using alcohol based perfumes may develop serious reactions
- 4- Requires regular dose titration once initiated
- 5- Can be used in patients with a history of psychosis in order to limit alcohol excess

Answer & Comments

Answer: 3- Patients using alcohol based perfumes may develop serious reactions

Antabuse inhibits the breakdown of acetaldehyde, which is a major metabolite of alcohol. It is the accumulation of acetaldehyde which causes the flushing, sweating, palpitations, nausea and vomiting seen in patients taking Antabuse who imbibe alcohol. These reactions may also occur with alcohol based products e.g. perfume. Antabuse is contraindicated in cirrhosis and heart disease, and psychosis is a relative contraindication for its use.



[Q: 1210] OnExamination - Clinical pharmacology

A 72-year-old female is diagnosed with giant cell arteritis and is treated with Prednisolone 60 mg per day.

What is the most appropriate treatment for the prevention of steroid induced osteoporosis?

- 1- Alfacalcidol
- 2- Calcium
- 3- Raloxifene
- 4- Tibolone
- 5- Vitamin D

Answer & Comments

Answer: 1- Alfacalcidol

The National Osteoporosis Society/ RCP Guidelines were updated in 2002. Patients older than 65 years are considered at high risk of osteoporotic fractures secondary steroid induced osteoporosis. The algorithm for treatment can be found on the National Osteoporosis Society website. Daily intake 1,500mg of calcium and 800U of Vit D3 is recommended. Bone mass measurements at baseline and follow up measurements will guide future therapeutic decisions in patients on long term steroids. There is also evidence to support the use of Bisphosphonates and calcitonin in these patients.



[Q: 1211] OnExamination - Clinical pharmacology

A 62 year-old female presents with deteriorating arthralgia associated with long-standing Rheumatoid arthritis. She was prescribed Celecoxib in place of naproxen.

Which of the following concerning Celecoxib is correct?

- 1- Co-treatment with diuretic can be given more safely than with naproxen
- 2- Celecoxib acts by inhibiting a different enzyme than naproxen
- 3- Celecoxib has a lower level of anti-platelet activity than naproxen
- 4- Anti-inflammatory effects of celecoxib are superior to those of naproxen

- 5- Celecoxib is associated with reduced hepatotoxicity compared with naproxen

Answer & Comments

Answer: 3- Celecoxib has a lower level of anti-platelet activity than naproxen

Celecoxib is a COX (Cyclo-oxygenase)-2 inhibitor differing from the other NSAIDs such as Naproxen which affects both COX-1 and COX-2. COX-1 is involved in platelet aggregation and inhibition of this by the NSAIDs produces its beneficial cardiovascular effects. However platelet aggregation is not affected by COX-2. Rofecoxib, Vioxx has been withdrawn due to its increased cardiovascular events compared with Naproxen.



[Q: 1212] OnExamination - Clinical pharmacology

Which of the following cardiac drugs shorten the QT interval?

- 1- Amiodarone
- 2- Digoxin
- 3- Moxonidine
- 4- Sodium nitroprusside
- 5- Sotalol

Answer & Comments

Answer: 2- Digoxin

Hypercalcemia, hypermagnesemia, digoxin, or thyrotoxicosis cause QT shortening.



[Q: 1213] OnExamination - Clinical pharmacology

The nurse bleeped you because an obese patient is feeling nauseous and is vomiting. He is also complaining of seeing green and yellow halos. He has recently been treated with a standard intravenous bolus of digoxin for fast atrial fibrillation. His creatinine clearance is normal. Digoxin toxicity is suspected.

What do you think is the cause of his symptoms?

- 1- Decreased hepatic excretion
- 2- Decreased protein binding
- 3- Decreased renal clearance
- 4- Decreased volume of distribution
- 5- Increased half life

Answer & Comments

Answer: 4- Decreased volume of distribution

Digoxin is concentrated in tissues and therefore has a large apparent volume of distribution. Serum digoxin concentrations are not significantly altered by large changes in fat tissue weight, so that its distribution space correlates best with lean (i.e., ideal) body weight, not total body weight. In this case, a higher dose than necessary was given due to calculation on the patient total body weight, resulting in digoxin toxicity. In other words, his distribution space had been overestimated. Approximately 25% of digoxin in the plasma is bound to protein.



[Q: 1214] OnExamination - Clinical pharmacology

Which of the following antiemetics functions through inhibition of neurokinin (NK) 1 receptor?

- 1- Aprepitant
- 2- Domperidone
- 3- Hyoscine
- 4- Granisteron
- 5- Ondansetron

Answer & Comments

Answer: 1- Aprepitant

Aprepitant is a neurokinin receptor blocker used in the prevention of chemotherapy induced nausea. Ondansetron and granisetron

are 5HT₃ antagonists. Hyoscine is an anticholinergic/antihistaminergic. Domperidone is an antidopaminergic agent.



[Q: 1215] OnExamination - Clinical pharmacology

With respect to symptoms of withdrawal related to chronic alcohol use, which of the following statements is correct?

- 1- Withdrawal reflects enhanced neurotransmission in Type A gamma-aminobutyric acid pathways.
- 2- Withdrawal reflects reduced neurotransmission in N-methyl-D-aspartate pathways.
- 3- Phenytoin is an effective treatment for seizures related to alcohol withdrawal.
- 4- Benzodiazepines are ineffective in the treatment of seizures secondary to alcohol withdrawal, due to cross tolerance with ethanol at Type A gamma amino-aminobutyric acid receptor.
- 5- Carbamazepine is as effective as Benzodiazepines in the acute treatment of the symptoms of alcohol withdrawal.

Answer & Comments

Answer: 5- Carbamazepine is as effective as Benzodiazepines in the acute treatment of the symptoms of alcohol withdrawal.

Carbamazepine at a starting dose of 800mg per 24hours has been shown to be as effective as oxazepam in the treatment of acute alcohol withdrawal. Phenytoin is not effective in the treatment of alcohol withdrawal-related seizures. Alcohol withdrawal reflects the damping of neurotransmission through Type A gamma-amino-butyric pathways, and enhanced neurotransmission through N-methyl-D-aspartate pathways.

For a review see NEJM348:18;1788-90.



[Q: 1216] OnExamination - Clinical pharmacology

A 60-year-old man presented with a rash over his forearms, shins and face when he visited cardiology clinic in the summer.

Which of the following medications is the most likely to be associated with this photosensitive rash?

- 1- Atenolol
- 2- Bendroflumethiazide
- 3- Clopidogrel
- 4- Digoxin
- 5- Ezetimibe

Answer & Comments

Answer: 2- Bendroflumethiazide

Photosensitivity is a common adverse effect and the cardiology drugs affected include amiodarone and thiazide diuretics. ACE inhibitors and ARAs commonly cause rashes some of which appear to be photosensitive.



[Q: 1217] OnExamination - Clinical pharmacology

A letter published in a medical journal suggests that an established antidepressant may cause photosensitivity. The manufacturer wishes to set up a study to determine rapidly and efficiently whether this is a true association.

Which one of the following techniques is most appropriate?

- 1- case control study
- 2- dose ranging study
- 3- double blind, randomized, placebo controlled study
- 4- meta-analysis
- 5- sequential trial

Answer & Comments

Answer: 4- meta-analysis

The drug is an established one and the correct answer can be found by elimination. A "double-blind, randomized, placebo controlled study" would be time consuming, expensive and unlikely to be powered enough to detect what may be a rare toxic effect. Remember the drug is established so there have been many patients taking it already and only lately a letter is published in a medical journal. A "dose ranging study" is really for another purpose - to decide the correct dose in early clinical trials so is hardly going to be of any use here. A "sequential" trial would be comparing one therapy to another sequentially (usually with wash out periods in between). Again there are unlikely to be enough subjects in the trial for this small risk. A case control study would look at cases of photosensitivity (perhaps in subjects taking any antidepressant medication) and compare them to age matched (or other criteria matched) control subjects to see if they were more / less / equally likely to be on the antidepressant in question.

A "meta-analysis" would look at combining all previous data and there would have at least been some of the trials that looked at photosensitivity for it to be of any use in this case. This seems the more logical option.



[Q: 1218] OnExamination - Clinical pharmacology

A 60-year-old lady is taking warfarin for stroke prevention in atrial fibrillation. She presents with a markedly raised INR.

Which of the following medications is the most likely to be the reason?

- 1- Aspirin
- 2- Carbamazepine
- 3- Ciprofloxacin
- 4- Flucloxacillin

5- St John's Wort

Answer & Comments

Answer: 3- Ciprofloxacin

Ciprofloxacin is an inhibitor of p450 and therefore prolongs the half life of warfarin and raises INR. Even patients are aware of the increased risk of bleeding with aspirin but it does not have a clear relationship with INR.



[Q: 1219] OnExamination - Clinical pharmacology

A 58-year-old female presented with unsteadiness and ataxia and gave a recent history of nausea and epigastric pain for which she had been prescribed an antacid and cimetidine. She was an epileptic and had been well controlled with phenytoin for eight years. She had been also been prescribed amitriptyline for depression, was receiving post-menopausal hormone replacement therapy and was self-medicating with St John's wort.

Which of the following drugs is most likely to be responsible for her presentation?

- 1- Amitriptyline
- 2- Antacid
- 3- Cimetidine
- 4- estradiol
- 5- St John's wort

Answer & Comments

Answer: 3- Cimetidine

This patient has developed phenytoin toxicity which has been precipitated by cimetidine which inhibits cytochrome P450 metabolism of phenytoin. Phenytoin concentration is reduced by St John's Wort, unaffected by amitriptyline which would however reduce seizure threshold; antacids may reduce phenytoin absorption and oestradiol metabolism may be increased by phenytoin.



[Q: 1220] OnExamination - Clinical pharmacology

Which of the following drugs is most likely to cause systemic lupus-like syndrome?

- 1- baclofen
- 2- isoniazid
- 3- methotrexate
- 4- procainamide
- 5- sulphasalazine

Answer & Comments

Answer: 4- procainamide

A recessive gene is responsible for activity of hepatic N-acetyl transferase resulting in slow or fast (intermediate and fast groups get lumped together) acetylation. 45% of the UK population are slow acetylators. Drugs affected include isoniazid, hydralazine, dapsone, procainamide and sulphasalazine. Slow acetylators have increased risk of isoniazid-induced peripheral neuropathy, and hydralazine or procainamide-induced SLE. Fast acetylators were considered more at risk of isoniazid-induced hepatitis but this is not borne by the recent evidence.



[Q: 1221] OnExamination - Clinical pharmacology

A 55 old male has been taking Methotrexate 7.5 mg weekly for sero-negative erosive rheumatoid arthritis with considerable clinical and symptomatic improvement. His most recent investigations performed two days ago reveals the following:

Haemoglobin 12.9 g/dl (12 - 16 g/dl)
 White cell Count $5.3 \times 10^9/L$ ($3.5 - 10 \times 10^9 /L$)
 Platelets $183 \times 10^9/L$ ($150 - 450 \times 10^9 /L$)
 Urea 4.2 mmol/l (3.8 - 8 mmol/L)
 Creatinine 88 $\mu\text{mol/l}$ (50 - 110 mmol/l)
 Alkaline phosphatase 92 iu/l (50 - 110 iu/l)
 AST 22 iu/l (5 - 40 iu/l)

ALT 15 iu/l (5 - 40 iu/l)

When should the next series of blood tests be performed?

- 1- One week
- 2- Two weeks
- 3- One month
- 4- Six months
- 5- One year

Answer & Comments

Answer: 3- One month

His results are normal and, with him receiving a stable dose of methotrexate, the most appropriate time interval for monitoring his profiles according to Prodigy, which should include FBC, Creatinine and AST/ALT, would be in one month. Similarly, the British Society of Rheumatology suggest monthly FBC when the results are stable.



[Q: 1222] OnExamination - Clinical pharmacology

A 60-year-old retired nurse with idiopathic Parkinson's disease presented with motor oscillations and on-off periods. She had received Co-Beneldopa for 5 years. Selegiline was added to her treatment.

Which one of the following enzymes does Selegiline act on to cause this adjuvant action?

- 1- catechol-O-methyltransferase
- 2- dopa decarboxylase
- 3- dopamine hydroxylase
- 4- monoamine oxidase
- 5- tyrosine hydroxylase

Answer & Comments

Answer: 4- monoamine oxidase

Selegiline is a MAO-B inhibitor.



[Q: 1223] OnExamination - Clinical pharmacology

A 30-year-old patient with learning difficulties is admitted as a medical emergency. The patient complains of headache, anorexia and vomiting. On examination she is febrile with a temperature of 38°C, pulse 110 bpm and is clinically jaundiced. Investigations reveal:

Bilirubin micromol/l (0-18)

Albumin 28 g/l (35-45)

AST 400 iu/l (5-40)

Alkaline Phosphatase 400 iu/l (50-120)

Prothrombin time 35 seconds (<14)

She was commenced on a new medication within the last 3 months, which do you suspect maybe contributing to the presentation?

- 1- Cabergoline
- 2- Carbamazepine
- 3- Lamotrigine
- 4- Metformin
- 5- Sodium Valproate

Answer & Comments

Answer: 5- Sodium Valproate

Sodium Valproate can occasionally have an idiosyncratic response leading to severe or even fatal hepatic toxicity. This is more common if the patient has a metabolic or degenerative disorder, organic brain disease or severe seizures associated with mental retardation. Usually this reaction occurs within the first 3 months of therapy.

Carbamazepine can be associated with jaundice occasionally however the history of mental retardation and short history of drug use point to sodium valproate as the cause. Lamotrigine can disrupt LFTs. Metformin and Cabergoline do not effect liver function however caution is advised when using these drugs in patients with hepatic disease.



[Q: 1224] OnExamination - Clinical pharmacology

A 45-year-old woman with a known history of depression, previously well controlled with fluoxetine, has started to suffer from anxiety, loss of interest and reduced appetite. She also complains of insomnia. She claims to taking her medications regularly according to prescription.

What will be the most appropriate management for her?

- 1- Add a benzodiazepine
- 2- Add lithium
- 3- Electroconvulsive therapy
- 4- Switch to another group of antidepressant
- 5- Switch to another SSRI

Answer & Comments

Answer: 4- Switch to another group of antidepressant

This patient has failed to respond to Fluoxetine. To switch to another group of antidepressant, especially a newer agent like Mirtazapine is a feasible approach. Mirtazapine is a newer antidepressant that exhibits both noradrenergic and serotonergic activity and was found to be an effective treatment for a substantial proportion of patients for whom an SSRI was ineffective and/or poorly tolerated.



[Q: 1225] OnExamination - Clinical pharmacology

A 45-year-old lady with a past history of depression presented to the Emergency department drowsy. He repeat prescription says she is taking diazepam and dosulepin and the ambulance crew say that she has taken an overdose of her medication. Her BP is 140/80, pulse 130 bpm, respiratory rate 7 per minute and O₂ sats 98% on air.

Which of the following is the most appropriate next action?

- 1- Give flumazenil
- 2- Give naloxone
- 3- Obtain an ECG
- 4- Refer for urgent haemodialysis
- 5- Start N-acetylcysteine infusion

Answer & Comments

Answer: 3- Obtain an ECG

This is a tricky case and will catch those who go for the first answer they see that's reasonable. The urge is to quickly treat the drowsy patient with respiratory depression with some sort of antidote but there needs to be a diagnostic step first. Tricyclic antidepressants can cause fatal arrhythmias and seizures which are very difficult to manage. An ECG would immediately indicate if there is a risk of significant tricyclic toxicity by showing a wide QRS complex or abnormal axis deviation.



[Q: 1226] OnExamination - Clinical pharmacology

A 55-year-old male who is being treated with Lithium for a bipolar disorder has a long history of hypertension for which he is receiving escalating doses of medication. On his most recent visit to clinic his blood pressure was noted to be 166/102 mmHg and new antihypertensive was added to his current antihypertensive therapy. Five days later he presents with features of Lithium toxicity including tremor, nausea and weakness.

The addition of which of the following drugs was likely to have precipitated the Lithium toxicity?

- 1- Doxazosin
- 2- Hydralazine
- 3- Irbesartan

- 4- Minoxidil
- 5- Moxonidine

Answer & Comments

Answer: 3- Irbesartan

The precipitation of Lithium toxicity by diuretics is well appreciated. Yet ACE inhibitors and Angiotensin Antagonists are also capable of precipitating Lithium toxicity through reduced Lithium clearance. Other drugs that may precipitate Lithium toxicity include NSAIDs, tetracycline, phenytoin and ciclosporin.



[Q: 1227] OnExamination - Clinical pharmacology

A 22-year-old male is admitted after drinking engine coolant in an apparent suicide attempt after finding his wife in bed with the postman. Investigations reveal:

pH 7.1
pO₂ 15.3 kPa
pCO₂ 3.2 kPa
Standard Bicarbonate 2.2 mmol/l
Serum Calcium 1.82 mmol/l

After replacing calcium, which of the following is the most appropriate treatment for this man?

- 1- Alcohol infusion
- 2- 8.4% bicarbonate infusion
- 3- Femopizole infusion
- 4- Gastric lavage
- 5- Haemodialysis

Answer & Comments

Answer: 2- 8.4% bicarbonate infusion

Engine coolant contains ethylene glycol. Ingestion of as little as 30-60ml is capable of causing death. Traditional management of poisoning includes the use of ethanol, with or

without hemodialysis. Activated charcoal is not indicated, and gastric lavage may be beneficial only in the first hour after ingestion. However, fomepizole, has recently been approved for use and is a competitive inhibitor of alcohol dehydrogenase. However, it is very expensive and the evidence supporting its use over alcohol is lacking. Also, this patient already has a severe metabolic acidosis. In this circumstance, antidotal therapy to block alcohol dehydrogenase with ethanol or 4-MP alone is insufficient to treat the poisoning. Data suggest that a severe lactic acidosis needs initial correction and in this patient the most appropriate treatment would be IV fluids with bicarbonate to correct the metabolic acidosis. Then haemodialysis is probably required.



[Q: 1228] OnExamination - Clinical pharmacology

Which of the following are centrally acting antihypertensive therapies?

- 1- Hydralazine
- 2- Minoxidil
- 3- Moxonidine
- 4- Phenoxybenzamine
- 5- Verapamil

Answer & Comments

Answer: 3- Moxonidine

Moxonidine and alpha-methyl dopa are centrally acting antihypertensives and modify blood pressure through central action modifying sympathetic activity. Verapamil is a calcium antagonist, minoxidil and hydralazine both vasodilators and phenoxybenzamine an alpha blocker.



[Q: 1229] OnExamination - Clinical pharmacology

Which of the following mechanisms best explains the action of Ezetimibe?

- 1- Activation of PPAR-alpha
- 2- Bile acid sequestration
- 3- Decreases hepatic cholesterol synthesis
- 4- Increases peroxisomal beta-oxidation of fatty acids
- 5- Inhibits cholesterol absorption

Answer & Comments

Answer: 5- Inhibits cholesterol absorption

Ezetimibe localises at the brush border of the small intestine, where it inhibits the absorption of cholesterol from the diet.



[Q: 1230] OnExamination - Clinical pharmacology

A 30-year-old male presented with a paranoid psychosis accompanied by visual hallucinations which resolved over the next three days.

Which one of the following is the most likely diagnosis?

- 1- Alcohol withdrawal.
- 2- Diazepam dependence.
- 3- Fluoxetine overdose.
- 4- Heroin withdrawal.
- 5- Smoking cannabis.

Answer & Comments

Answer: 1- Alcohol withdrawal.

The paranoid psychosis with visual hallucinations is highly suggestive of delirium tremens - alcohol withdrawal.



[Q: 1231] OnExamination - Clinical pharmacology

A 68-year-old lady with mitral valve disease and atrial fibrillation is taking warfarin. Lately her INR has fallen and the dose of warfarin has had to be increased.

Which of the following new treatments may account for this change?

- 1- Allopurinol
- 2- Amiodarone
- 3- Clarithromycin
- 4- Sertraline
- 5- St John's wort

Answer & Comments

Answer: 5- St John's wort

The metabolism of warfarin has been increased since it is becoming less effective. St John's Wort is an enzyme inducer. The other drugs are enzyme inhibitors.



[Q: 1232] OnExamination - Clinical pharmacology

A 72-year-old man is discharged from hospital following a stroke. During his stay he was started on several new medications. He presents with diarrhoea.

Which of the following medications is most likely to be the cause?

- 1- Clopidogrel
- 2- Enalapril
- 3- Metformin
- 4- Pioglitazone
- 5- Simvastatin

Answer & Comments

Answer: 3- Metformin

Although all the medications listed could cause gastrointestinal disturbances it is metformin that is by far the most likely.



[Q: 1233] OnExamination - Clinical pharmacology

Which of the following are correct concerning an Intention To Treat analysis?

- 1- It is a variation of a meta-analysis analysing specifically studies employing double blind placebo controlled trials.
- 2- It is a study where all included patients are treated with the active drug.
- 3- It is a study where all non-compliant patients are removed from analysis.
- 4- It is a study that analyses all patients randomised to the study.
- 5- It is a study comparing the effects of treatment with placebo or active treatment and also a similar group of non-study participants.

Answer & Comments

Answer: 4- It is a study that analyses all patients randomised to the study.

When one considers a randomised study, although the principles of double blind placebo controlled may apply, the actual preferential fall out of patients, for instance treated with placebo as they do not perceive a benefit, may itself introduce bias. Thus, Intention to Treat studies would argue that one should commit all patients that originally participate in the study to analysis.

The advantages of this approach are that it maintains treatment groups that are similar apart from random variation. This is the reason for randomisation, and the feature may be lost if analysis is not performed on the groups produced by the randomisation process. Secondly, it permits for non-compliance and deviations from policy by clinicians.



[Q: 1234] OnExamination - Clinical pharmacology

Which one of the following is correct regarding long-acting beta-2 agonists?

- 1- Can be used to prevent activity-induced symptoms without anti-inflammatory therapy.

- 2- Become less effective over time (tolerance).
- 3- Are beneficial in acute viral croup.
- 4- Protect against allergen challenge for up to 48 hours.
- 5- Should not be used in association with erythromycin.

Answer & Comments

Answer: 1- Can be used to prevent activity-induced symptoms without anti-inflammatory therapy.

Long-acting beta-2 agonists, e.g. salmeterol, can be used twice daily to assist in prophylaxis in chronic asthma as Step 3 of the British Thoracic Society Asthma Guidelines. There is no evidence that the bronchodilator effect wanes with time, though there is debate that it may become less effective in protecting against exercise or methocoline induced bronchospasm. Its duration of action is around 12 hours, and has gone completely by 36 hours. Aminophylline interacts with erythromycin, giving an increased risk of toxicity. There is no evidence that salmeterol works in viral croup, though oral steroids are highly effective.



[Q: 1235] OnExamination - Clinical pharmacology

A 65-year-old lady with a history of recurrent DVT. She has been weaned off her warfarin and started on intravenous heparin prior to cardiac bypass for ischaemic heart disease. She seems to require very high doses of heparin to achieve adequate anticoagulation especially during surgery.

Which of the following conditions would explain her thrombophilia and her heparin resistance?

- 1- Activated Protein C resistance
- 2- Antithrombin III deficiency
- 3- Lupus anticoagulant

- 4- Protein C deficiency
- 5- Protein S deficiency

Answer & Comments

Answer: 2- Antithrombin III deficiency

"Cardiac surgery produces a unique activation of coagulation due to the presence of the cardiopulmonary bypass (CPB) circuit. Whilst not yet fully elucidated, the mechanisms of activation of coagulation during CPB may involve activation of fX by the tissue factor-mediated pathway within the pericardial cavity, in addition to direct generation of fXa on the surface of monocytes by Cathepsin G, a substance released from activated monocytes. The inhibition of fXa in these situations involves the AT-dependent mechanism of action of heparin."



[Q: 1236] OnExamination - Clinical pharmacology

A 55-year-old female has recently commenced Leflunomide for sero-negative rheumatoid arthritis. At baseline, prior to commencing the drug, her AST was 33 iu/l and her ALT was 40 iu/l. She attends for routine blood monitoring. Her FBC is normal but her liver function tests reveal:

AST 58 iu/l (5 - 40 iu/l)

ALT 71 iu/l (7 - 45 iu/l)

Alkaline Phosphatase 100 iu/l (50 - 120 iu/l)

Bilirubin 12 micromol/l (5 - 18 iu/l)

What is the most appropriate management option for this patient?

- 1- Continue Leflunomide and monitor LFTs in one month
- 2- Continue Leflunomide and monitor LFTs in two weeks
- 3- Stop Leflunomide and commence washout procedure.
- 4- Stop Leflunomide and seek urgent rheumatological advice.

- 5- Stop the Leflunomide and repeat tests in two weeks.

Answer & Comments

Answer: 5- Stop the Leflunomide and repeat tests in two weeks.

Leflunomide is associated with serious hepatotoxicity. Increased aminotransferases are commonly seen in association with therapy occurring in 15-20% of cases (less than a two fold rise). However, more serious elevation (greater than 3 fold) is seen in less than 5%. Generally, most hepatic events occur within the first six months of use. Guidelines suggest that where there is a less than 2 fold elevation of transaminases, the drug should be stopped and the LFT repeated in two weeks. If the results have returned to normal then the drug can be recommenced.

As the active drug has such a long half life (approx 15 days), in patients with severe elevations of LFTs, wash out treatment may be required to assist in excretion/reduce absorption of the drug. This includes Cholestyramine and activated Charcoal.



[Q: 1237] OnExamination - Clinical pharmacology

A 42-year-old man presents with gingival hypertrophy.

Which of his cardiac medications is likely to be responsible?

- 1- Amlodipine
- 2- Atenolol
- 3- Digoxin
- 4- GTN
- 5- Simvastatin

Answer & Comments

Answer: 1- Amlodipine

Calcium channel blockers and drugs like phenytoin and cyclosporin are associated with gingival hypertrophy.



[Q: 1238] OnExamination - Clinical pharmacology

A 50-year-old male has a blood pressure of 160/90 on two consecutive days. You decide that you are going to initiate drug therapy.

Which of the following statements regarding your decision is correct?

- 1- An alpha-blocker would be a first line agent in this patient
- 2- Spironalactone would be an appropriate second line agent in this patient
- 3- If the patient is non-caucasian, a beta-blocker would be an appropriate first line treatment
- 4- Potassium monitoring is not required if an ACE inhibitor is prescribed without the addition of spironalactone
- 5- ACE inhibitors should not be used as first line treatment in Afro-Caribbean patients

Answer & Comments

Answer: 5- ACE inhibitors should not be used as first line treatment in Afro-Caribbean patients

ACE inhibitors have low efficacy in black patients in the clinical trials of ACE inhibitors. According to the British Hypertension Society guidelines (J Hum Hypertension 2003;17:81-86) first line treatment in black patients, and patients greater than 55 years of age, should be with a diuretic or a calcium channel blocker. An alpha blocker or spironalactone should only be used as an adjunct treatment in resistant hypertension



[Q: 1239] OnExamination - Clinical pharmacology

A 62-year-old male is prescribed Sildenafil for impotence.

What is the mechanism of action through which Sildenafil works?

- 1- Central Dopaminergic agent
- 2- Guanylate cyclase agonist
- 3- Nitric oxide synthase agonist
- 4- Phosphodiesterase inhibitor
- 5- Selective alpha-sympathetic inhibitor

Answer & Comments

Answer: 4- Phosphodiesterase inhibitor

Sildenafil is a phosphodiesterase 5 inhibitor. Inhibition of this enzyme results in an accumulation of nitric oxide in the cavernosal veins resulting in venodilation and facilitating an erection.



[Q: 1240] OnExamination - Clinical pharmacology

Which of the following mechanisms best explains the action of OMACOR (omega-3-acid ethyl esters)?

- 1- Activation of PPAR-alpha
- 2- Bile acid sequestration
- 3- Decreases hepatic cholesterol synthesis
- 4- Increases peroxisomal beta-oxidation of fatty acids
- 5- Inhibits cholesterol absorption

Answer & Comments

Answer: 4- Increases peroxisomal beta-oxidation of fatty acids

Omacor reduces triglycerides by different, independent effects in the liver. The synthesis of triglycerides is inhibited through reduced production of triglycerides in the liver, as EPA and DHA are poor substrates for the enzymes

responsible for triglyceride synthesis. EPA and DHA also inhibit esterification of other fatty acids. Omacor increases peroxisomal beta-oxidation of fatty acids in the liver.



[Q: 1241] OnExamination - Clinical pharmacology

A 16-year-old female is admitted after taking an overdose of her mother's propranolol tablets approximately 2 hours ago. On examination she is drowsy and has a pulse of 40 beats per minute with a blood pressure of 80/40 mmHg. She is treated with activated charcoal, IV fluids and IV atropine but her bradycardia and hypotension fail to respond.

Which of the following would be the most appropriate next stage in her management?

- 1- IV adrenaline
- 2- IV amiodarone
- 3- IV glucagon
- 4- IV Phenytoin
- 5- Insertion of temporary pacemaker

Answer & Comments

Answer: 3- IV glucagon

In those in whom initial atropine is unsuccessful, IV Glucagon is a recommended treatment for β -blocker overdose with some evidence indicating improvement in bradycardia and blood pressure.



[Q: 1242] OnExamination - Clinical pharmacology

A 42-year-old man presented with confusion following a seizure. He has a history of epilepsy and is also known to the community psychiatry team. Examination reveals that he has a temperature of 37°C, BP 138/84, coarse tremor and a pulse of 90 bpm.

Which of the following is the most likely underlying diagnosis?

- 1- Benzodiazepine overdose

- 2- Carbamazepine toxicity
- 3- Lithium toxicity
- 4- Neuroleptic malignant syndrome
- 5- Tricyclic overdose

Answer & Comments

Answer: 3- Lithium toxicity

The tremor, seizure and confusion should raise the possibility of Lithium toxicity which is the condition that best fits this clinical picture.



[Q: 1243] OnExamination - Clinical pharmacology

A 50-year-old man presented with a milky discharge from his nipples. He had a history of depression and gastro-oesophageal reflux disease and was on a number of medications.

Plasma Prolactin 650 mU/L (< 360)

Which of the following is the most likely cause of his symptoms?

- 1- Amitryptiline
- 2- Cimetidine
- 3- Fluoxetine
- 4- Metoclopramide
- 5- Omeprazole

Answer & Comments

Answer: 4- Metoclopramide

This man has galactorrhoea and raised prolactin. The most likely culprit is metoclopramide through its action on dopamine. It release prolactin through dopamine antagonism.



[Q: 1244] OnExamination - Clinical pharmacology

A 70-year-old man presents with an episode of syncope. On subsequent investigation he is found to have marked postural hypotension. He has been taking felodipine for

hypertension for a number of years and he also takes aspirin. On further questioning he appears to have taken up a new healthier lifestyle on his seventieth birthday.

Which of the following health supplements is he most likely to have taken that would have contributed to the calcium-channel blocker induced hypotension?

- 1- Cranberry juice
- 2- Cod liver oil capsules
- 3- Ginseng
- 4- Grapefruit juice
- 5- Vitamin C

Answer & Comments

Answer: 4- Grapefruit juice

Grapefruit juice interacts with drugs. The basis for this interaction has been diligently explored and appears to relate to both flavanoid and nonflavanoid components of grapefruit juice interfering with enterocyte CYP3A4 activity. Of the calcium channel blockers felodipine in particular is affected. Am J Hypertens (2006) 19: 768-73



[Q: 1245] OnExamination - Clinical pharmacology

In which of the following would the first drug be associated with increased pharmacological action of the second drug?

- 1- Erythromycin : theophylline
- 2- Phenytoin : ethinyloestradiol
- 3- Ranitidine : corticosteroid
- 4- Rifampicin : warfarin
- 5- Valproate : phenobarbitone

Answer & Comments

Answer: 1- Erythromycin : theophylline

Erythromycin would inhibit the metabolism of theophylline. Ranitidine unlike Cimetidine is

not an enzyme inhibitor. Phenytoin would speed up metabolism of Ethinyl-Oestradiol making the pill less effective. Rifampicin is a well recognised enzyme inducer.



[Q: 1246] OnExamination - Clinical pharmacology

Which of the following pharmacological agents acts through the opening of potassium channels?

- 1- Amiloride
- 2- Glibenclamide
- 3- Lidocaine
- 4- Nicorandil
- 5- Phenytoin

Answer & Comments

Answer: 4- Nicorandil

Nicorandil is a potent potassium channel activator. It relaxes vascular smooth muscle through membrane hyperpolarization via increased transmembrane potassium conductance and, like nitrates, through an increase in intracellular cyclic GMP. Glibenclamide blocks potassium channels. Amiloride inhibits the action of aldosterone on the distal convoluted tubule producing potassium reabsorption.



[Q: 1247] OnExamination - Clinical pharmacology

A 23-year-old man with known peanut allergy presented to the Emergency department with anaphylaxis. He has a swollen face and lips. His BP is 90/60, pulse 110 bpm and he is wheezy.

Which of the following formulations of adrenaline should be given?

- 1- 0.5 ml of 1:10000 adrenaline IM
- 2- 0.5 ml of 1:1000 adrenaline IM
- 3- 5 ml of 1:1000 adrenaline IM
- 4- 10 ml of 1:10000 adrenaline IV

- 5- Nebulised adrenaline

Answer & Comments

Answer: 2- 0.5 ml of 1:1000 adrenaline IM

"For adults, a dose of 0.5 mL adrenaline 1:1000 solution (500 micrograms) should be administered intramuscularly, and repeated after about 5 minutes in the absence of clinical improvement or if deterioration occurs after the initial treatment especially if consciousness becomes - or remains - impaired as a result of hypotension. In some cases several doses may be needed, particularly if improvement is transient." Resuscitation Council UK

Adult Epipen which allergy sufferers can carry with them contains 0.3 mg adrenaline in a 1:1000 dilution for IM injection.



[Q: 1248] OnExamination - Clinical pharmacology

A middle aged lady presents with cervical and inguinal lymphadenopathy. She is also experiencing pins and needles in glove and stocking distribution. She had previous of epilepsy and was under regular medication.

Which of the following drugs is most likely to cause her symptoms?

- 1- Carbamazepine
- 2- Phenobarbitone
- 3- Phenytoin
- 4- Sodium valproate
- 5- Vigabatrin

Answer & Comments

Answer: 3- Phenytoin

Recognized side effects of phenytoin include drowsiness, ataxia, confusion, blurred vision, dizziness, nystagmus, permanent cerebellar ataxia, peripheral neuropathy, rashes, gum hypertrophy, thickening of the facial features,

lymphadenopathy, chorea, and sleep disturbance. Remarkable side effects of other anti-epileptic drugs are: drowsiness, blurred vision, dizziness, leucopenia, SIADH and rash (carbamazepine), liver toxicity (sodium valproate), severe rash (lamotrigine), retinal damage (vigabatrin) and aplastic anemia (felbamate).



[Q: 1249] OnExamination - Clinical pharmacology

Which of the following regarding Infliximab is most true

- 1- Is a monoclonal antibody to the glycoprotein IIb-IIIa receptor
- 2- Is authorised for the treatment of severe ulcerative colitis
- 3- Is licensed for the treatment of rheumatoid arthritis
- 4- It prevents relapse of Crohn's disease in patients who are in remission
- 5- Must not be used in combination with methotrexate due to increased toxicity

Answer & Comments

Answer: 3- Is licensed for the treatment of rheumatoid arthritis

Infliximab is a monoclonal antibody to TNF alpha. It is licensed for the treatment of:- (1). Severe active Crohn's disease refractory to corticosteroid or immunosuppressant therapy and for refractory fistulas. (2). Rheumatoid arthritis in adults whose response to disease-modifying antirheumatic drugs has been inadequate. Before starting therapy and throughout treatment, patients should be evaluated carefully for tuberculosis as there have been reports of the onset or reactivation of TB including miliary TB and some unusual extrapulmonary TB. Infliximab must be given concomitantly with methotrexate and requires IV infusion in a hospital setting. Some other monoclonal antibodies in clinical use

include (1)Digibind - digoxin-binding antibody for treatment of overdoses (increases clearance); (2)Abciximab: glycoprotein IIb/IIIa receptor (for unstable angina); (3)Pexelizumab: anti-C5 (complement) - anti-inflammatory: reduces MI and death following CABG.)



[Q: 1250] OnExamination - Clinical pharmacology

45-year-old woman has taken an unknown quantity of Amitriptyline tablets that were being prescribed for her depression approximately four hours ago. She is feeling drowsy, agitated and has a dry mouth. An ECG shows wide QRS complexes with arrhythmias.

Blood Gas Analysis revealed

pH 7.2

paO₂ 10 KPa (11-13)

paCO₂ 4 KPa (4.7-6)

What is the most appropriate treatment?

- 1- Activated Charcoal
- 2- Gastric Lavage
- 3- Haemodialysis
- 4- Intravenous Insulin
- 5- Intravenous Sodium Bicarbonate

Answer & Comments

Answer: 5- Intravenous Sodium Bicarbonate

There is no specific treatment for Tricyclic antidepressant poisoning. 500 ml of 1.26% sodium bicarbonate should be used to treat arrhythmias, hypotension and significant ECG abnormalities to a pH of 7.50 - 7.55 in Tricyclic antidepressant overdose even in the absence of acidosis.



[Q: 1251] OnExamination - Clinical pharmacology

A 52-year-old woman who complains of exertional breathlessness presents to the

clinic as she is desperate to stop smoking. She has had a number of unsuccessful attempts to stop smoking over the years and has tried nicotine patches.

Which of the following would be an appropriate choice to assist in her attempts at smoking cessation?

- 1- Acupuncture
- 2- Hypnotism
- 3- Nicotine gum
- 4- Nortriptyline
- 5- Varenicline

Answer & Comments

Answer: 5- Varenicline

Varenicline (Champix) is an oral anti-smoking agent with dual action, reducing the craving for cigarettes and also making the smoking of cigarettes less pleasurable. ASH - action on smoking and health have released guidance on its use. It appears to be effective and safe with the main side effect being nausea.

Varenicline appears to be more effective in clinical trials than either bupropion or placebo and is prescribed for 12 weeks in the first instance with further 12 week course if craving still persists.



[Q: 1252] OnExamination - Clinical pharmacology

A 59-year-old male presents with a three day history of marked muscle aches and weakness. He has ischaemic heart disease for which he takes a number of drugs including simvastatin and has been taking these drugs for a number of years without any problem. On this occasion his CPK confirms a diagnosis of rhabdomyolysis with a level of 4200 iu/l (<200).

Which of the following health supplements is he most likely to have taken that would have

contributed to the statin-induced rhabdomyolysis?

- 1- Cranberry juice
- 2- Cod liver oil capsules
- 3- Ginseng
- 4- Grapefruit juice
- 5- Vitamin C

Answer & Comments

Answer: 4- Grapefruit juice

Grapefruit juice is well recognised to inhibit statin metabolism thereby potentiating the myotoxicity. In particular, grapefruit juice should be avoided with simvastatin and lovastatin and it also inhibits metabolism of calcium channel blockers and theophylline.



[Q: 1253] OnExamination - Clinical pharmacology

Which of the following antiemetics functions as a cholinergic muscarinic antagonist?

- 1- Aprepitant
- 2- Domperidone
- 3- Hyoscine
- 4- Metoclopramide
- 5- Ondansetron

Answer & Comments

Answer: 3- Hyoscine

Scopolamine is named after the genus Scopolia. The name "hyoscine" is from the scientific name for henbane, Hyoscyamus niger. It acts as a competitive antagonist at muscarinic acetylcholine receptors; it is thus classified as an anticholinergic or as an anti-muscarinic drug.



[Q: 1254] OnExamination - Clinical pharmacology

A 59-year-old male type 2 diabetic is attending

the foot clinic regularly. He has a neuropathic ulcer complicated by osteomyelitis a deep wound swab has grown Staphylococcus aureus and E coli. He also takes warfarin for atrial fibrillation.

Which of the following antibiotics will reduce the anticoagulant effect of Warfarin?

- 1- Ciprofloxacin
- 2- Co-trimoxazole
- 3- Erythromycin
- 4- Metronidazole
- 5- Rifampicin

Answer & Comments

Answer: 5- Rifampicin

The anticoagulant effect of warfarin can be affected by drugs, which induce or inhibit the action of enzymes involved in the metabolism of warfarin. Rifampicin is known to induce the action of such enzymes therefore increasing the metabolism of warfarin so reducing its anticoagulant effect. Erythromycin and ciprofloxacin inhibit the effect of these enzymes therefore enhancing the anticoagulant effect of warfarin.

Metronidazole and Co-trimoxazole inhibit the clearance of the active S isomer of warfarin therefore enhancing its anticoagulant effect.



[Q: 1255] OnExamination - Clinical pharmacology

A 40-year-old man has a hygienist appointment with his dentist for scaling. He is known to have a congenital bicuspid aortic valve.

Which of the following is the most appropriate form of prophylaxis against endocarditis?

- 1- Amoxicillin 1g IV + gentamicin 120mg IV pre-procedure
- 2- Amoxicillin 3g PO pre-procedure
- 3- Gentamicin 120mg IM pre-procedure

- 4- Metronidazole 1g PO pre-procedure
- 5- No antibiotics required

Answer & Comments

Answer: 2- Amoxicillin 3g PO pre-procedure

Although often asymptomatic and affecting 1 - 2% of the population bicuspid aortic valve is a risk factor for endocarditis and later development of aortic valve disease. If known, patients should receive antibiotic prophylaxis.



[Q: 1256] OnExamination - Clinical pharmacology

A 17-year-old female presents to A+E following self-confessed paracetamol poisoning after discovering she is 8 weeks pregnant and had a row with her boyfriend. She claims to have taken an approximately 30 paracetamol tablets approximately 58 hours ago. Her history is considered to be reliable. There are no abnormalities to find on examination. Her blood sugar by finger prick testing was 3.1 mmol/l.

Which of the following would be the most appropriate treatment for this patient?

- 1- Haemodialysis
- 2- Intravenous dextrose infusion
- 3- Intravenous N-acetylcysteine
- 4- Oral activated charcoal
- 5- Oral vitamin K

Answer & Comments

Answer: 3- Intravenous N-acetylcysteine

Irrespective of the pregnancy, this girl should receive n-acetyl cysteine. Paracetamol concentration is unhelpful in delayed presentation of paracetamol overdose. A dose of >150mg/kg is considered to be toxic and toxicity occurs at a lower concentration if the patient is thought to be in high risk group. Clotting screen (INR), liver function tests, acid-

base balance and plasma glucose should be taken without delay prior to starting treatment with N-acetylcysteine. Serial monitoring of clotting screen is required and N-acetylcysteine should continue until INR returns to normal. Further advice on treatment of complicated cases should be sought from National Poisons Information Service. Other supportive treatment is guided by the patients condition.



[Q: 1257] OnExamination - Clinical pharmacology

In a chronic disease which has no known effective treatment, a new treatment is known to be effective in animal models and shows promise in short-term studies in patients.

There are some theoretical concerns about toxicity involving liver and bone marrow although no cases have been observed in studies so far.

What is the most appropriate next step in the drug's development?

- 1- case control study
- 2- No further studies should be done and drug development should be stopped
- 3- open study
- 4- randomised double blind placebo controlled study
- 5- randomised single blind placebo controlled study

Answer & Comments

Answer: 4- randomised double blind placebo controlled study

The story that is described is of an early drug development that has gone through phase I trials (normal volunteers) and phase two studies (more normal volunteers but it also mentions 'studies in patients'). The next step in the development of this drug is a phase 3 study - where the drug's efficacy and safety

should be tested against a placebo. Take a look at this pdf file for a good description of drug development.



[Q: 1258] OnExamination - Clinical pharmacology

A 45-year-old female with chronic schizophrenia was recently converted to a new anti-psychotic agent. She presented two weeks later with a sore throat and fever.

Her full blood count shows:

Haemoglobin 12.5 g/dl

White cell count $1.3 \times 10^9/L$

Platelets $135 \times 10^9/L$

What drug is she likely to have commenced?

- 1- Clozapine
- 2- Haloperidol
- 3- Olanzapine
- 4- Quetiapine
- 5- Risperidone

Answer & Comments

Answer: 1- Clozapine

Unlike the other newer antipsychotic agents, Clozapine is associated with agranulocytosis in approximately 1-2% of patients. The mechanism through which this happens remains unclear.



[Q: 1259] OnExamination - Clinical pharmacology

A 45-year-old female attend the clinic complaining of headache and vomiting for 5 days. She has a history of scleroderma complicated by stage V chronic kidney disease. On examination, she is tachycardic and has a blood pressure of 240/130mmhg; funduscopy reveals grade 3 hypertensive retinopathy.

Which of the following is a centrally acting antihypertensive agent.

- 1- Diazoxide
- 2- Hydralazine
- 3- Minoxidil
- 4- Moxonidine
- 5- Sodium nitroprusside

Answer & Comments

Answer: 4- Moxonidine

Moxonidine is centrally acting and is licensed for mild to moderate hypertension not controlled by beta blockers, ACE inhibitors, calcium channel antagonists and thiazides. Moxonidine is a selective agonist at the imidazoline subtype 1 receptor. This receptor subtype is found in the medulla oblongata. Moxonidine causes a decrease in sympathetic nervous system activity and, therefore, a decrease in blood pressure.

The other drugs listed are vasodilator in action. Diazoxide, and sodium nitroprusside can be used intravenously in hypertensive emergencies. Minoxidil is reserved for when hypertension is resistant to other treatments; it causes fluid retention and oedema, however, it is effective in combination with a β -blocker and loop diuretic. Hydralazine can be given orally also in combination with a diuretic and β -blocker; side effects include reflex tachycardia and fluid retention.



[Q: 1260] OnExamination - Clinical pharmacology

A clinical trial assessing a new lipid lowering therapy for stroke allocates 1000 patients to active treatment and another 1000 patients to placebo. Results demonstrate that number needed to treat (NNT) is 20 for the prevention of the primary end-point.

Which of the following best describes the results?

- 1- 20 patients in the treatment group were protected from stroke.

- 2- 20 extra patients in the placebo group had a stroke
- 3- For 1000 patients treated with active therapy, there would be 20 fewer strokes
- 4- For 1000 patients treated with active therapy, there would be 50 fewer strokes.
- 5- For every 1000 patients treated with active therapy there would be 100 fewer strokes

Answer & Comments

Answer: 4- For 1000 patients treated with active therapy, there would be 50 fewer strokes.

This prevention study for stroke reveals that 20 patients need to be treated to prevent one event. Thus if you treat a 1000 patients then you will expect to have 50 fewer strokes.



[Q: 1261] OnExamination - Clinical pharmacology

A 55-year-old man with type 2 diabetes has noticed elevation of his blood glucose levels on a new treatment for his lipids. He says his diet and exercise levels are unchanged; his HbA1c has also deteriorated by about 0.5%.

Which one of the following drugs is the likely cause?

- 1- cholestyramine
- 2- ezetimibe
- 3- fenofibrate
- 4- nicotinic acid
- 5- rosuvastatin

Answer & Comments

Answer: 4- nicotinic acid

The mechanism of the effect of nicotinic acid on glucose is not entirely clear but, in some patients, it may increase blood glucose. For the majority of patients with diabetes it has a minimal effect.

"Since nicotinic acid inhibits hepatic triglyceride synthesis the increased availability of free fatty acids may stimulate hepatic glucose output, either directly or indirectly. Free fatty acids are known to stimulate gluconeogenesis. Alternatively, free fatty acids may replace glucose as a primary energy source, enhancing glucose output by the liver. Another theory holds that free fatty acids rebound above baseline levels following initial suppression by nicotinic acid, blocking glucose uptake by skeletal muscle. Direct effects on beta-cell function have also been postulated, although there is no evidence to support this." Br J Diabetes Vasc Dis 2004;4:7885



[Q: 1262] OnExamination - Clinical pharmacology

A 60-year-old female suffers from bipolar affective disorder and is being treated with Lithium. She also has a long history of hypertension for which she is on treatment. During a recent clinic visit her blood pressure was noted to be 170/94 mmHg and a new antihypertensive agent was added. A week later she presents with features of Lithium toxicity including tremor, nausea and weakness.

The addition of which one of the following drugs was likely to have precipitated the Lithium toxicity?

- 1- Doxazosin
- 2- Hydralazine
- 3- Lisinopril
- 4- Minoxidil
- 5- Moxonidine

Answer & Comments

Answer: 3- Lisinopril

The precipitation of Lithium toxicity by diuretics is well appreciated. Yet ACE inhibitors and Angiotensin Antagonists are also capable of precipitating Lithium toxicity

through reduced Lithium clearance. Other drugs that may precipitate Lithium toxicity include NSAIDs, tetracycline, phenytoin and ciclosporin.



[Q: 1263] OnExamination - Clinical pharmacology

A 52-year-old lady presented with a history of crushing central chest pain, sweating and dyspnoea. An ECG confirms acute myocardial infarction with ST elevation in leads V2 - V4 and ST depression in leads II and III.

Which of the following would be a contraindication to thrombolysis in this lady?

- 1- History of peptic ulcer disease
- 2- Intracranial neoplasm
- 3- Menstruation
- 4- Pre-proliferative diabetic retinopathy
- 5- Stroke 6 months previously

Answer & Comments

Answer: 2- Intracranial neoplasm

Contraindications to thrombolysis include intracranial neoplasm as here, stroke in the last 2 months, pregnancy, active internal bleeding, aortic dissection, recent significant head injury, severe and uncontrolled hypertension.



[Q: 1264] OnExamination - Clinical pharmacology

A 33-year-old woman with a history of alcoholism and self-neglect, presents with an episode of blood streaked vomiting. This is attributed to minor Mallory-Weiss tear. She is admitted to hospital and given an intravenous infusion of 5% dextrose. Her serum potassium concentration is noted the following day to have fallen to 1.9mmol/L (NR 3.5-4.9mmol/L) on admission.

What is the likely mechanism for the fall in potassium concentration?

- 1- Cortisol release in response to stress increasing renal potassium loss
- 2- Decompensated liver failure causing aldosterone secretion
- 3- Intracellular re-uptake in response to re-feeding with glucose
- 4- Metabolic acidosis increasing renal potassium excretion
- 5- Potassium levels falling following gastric loss in vomiting

Answer & Comments

Answer: 3- Intracellular re-uptake in response to re-feeding with glucose

This neglected person is being fed with dextrose, which will cause an elevation of circulating insulin to maintain glycaemic control. This will consequently drive potassium intracellularly so reducing extracellular potassium concentration.



[Q: 1265] OnExamination - Clinical pharmacology

Which of the following drugs interacts with cranberry juice?

- 1- Amiodarone
- 2- Digoxin
- 3- Propranolol
- 4- Simvastatin
- 5- Warfarin

Answer & Comments

Answer: 5- Warfarin

This is a pathetic question but apparently this theme has been asked in the exam. I suspect that the authors of this were the culprits in composing this question. The answer is warfarin.



[Q: 1266] OnExamination - Clinical pharmacology

A 45-year-old male takes Lithium for a bipolar affective disorder.

Which of the following drugs would be contra-indicated in conjunction with Lithium?

- 1- Atenolol
- 2- Bendroflumethiazide
- 3- Codeine Phosphate
- 4- Flucloxacillin
- 5- Thyroxine

Answer & Comments

Answer: 2- Bendroflumethiazide

Caution should be exercised when taking as the latter may reduce renal clearance of lithium and increase serum lithium concentrations. NSAIDs also increase Lithium concentrations. Metronidazole, ACEis and Calcium channel blockers also increase serum Lithium concentrations.



[Q: 1267] OnExamination - Clinical pharmacology

Which of the following antiemetics functions through antagonism of the 5-hydroxytryptamine 3A receptor?

- 1- Aprepitant
- 2- Domperidone
- 3- Hyoscine
- 4- Metoclopramide
- 5- Ondansetron

Answer & Comments

Answer: 5- Ondansetron

Ondansetron is a serotonin 5-HT₃ receptor antagonist used mainly to treat nausea and vomiting following chemotherapy. Its effects are thought to be on both peripheral and central nerves. One part is to reduce the

activity of the vagus nerve, which is a nerve that activates the vomiting center in the medulla oblongata, the other is a blockage of serotonin receptors in the chemoreceptor trigger zone. It does not have much effect on vomiting due to motion sickness. This drug does not have any effect on dopamine receptors or muscarinic receptors.



[Q: 1268] OnExamination - Clinical pharmacology

An 85-year-old woman presented with bilateral osteoarthritis of the knees. She had no history of previous gastrointestinal disease.

Which of the following is the most appropriate initial treatment for her?

- 1- Celecoxib
- 2- Naproxen
- 3- Dihydrocodeine
- 4- Paracetamol
- 5- Topical diclofenac.

Answer & Comments

Answer: 4- Paracetamol

The recommendations of the American College of Rheumatology published in Arthritis and Rheumatism 2000, recommend acetaminophen (paracetamol) together with non-pharmacological interventions (exercise, diet) as first line therapy of mild/moderate OA of hips or knees.



[Q: 1269] OnExamination - Clinical pharmacology

A 40-year-old ex-footballer presents requesting treatment for alcoholism and is prescribed disulfiram.

What is the mode of action of Disulfiram?

- 1- Decreases severity of alcohol withdrawal
- 2- Helps alcoholics to drink safely

- 3- Inhibits acetaldehyde dehydrogenase activity
- 4- Inhibits alcohol dehydrogenase activity
- 5- Reduces the desire for alcohol

Answer & Comments

Answer: 3- Inhibits acetaldehyde dehydrogenase activity

Alcohol is mainly metabolized in the liver to acetaldehyde by alcohol dehydrogenase. Acetaldehyde is then oxidized to acetate by acetaldehyde dehydrogenase (AcDH). Disulfiram irreversibly inhibits the oxidation of acetaldehyde by competing with the cofactor nicotinamide adenine dinucleotide (NAD) for binding sites on (AcDH). The increased acetaldehyde levels are thought to produce the unpleasant side effects associated with acetaldehyde syndrome such as headaches, nausea, flushing etc.



[Q: 1270] OnExamination - Clinical pharmacology

A 60-year-old lady develops a fracture of the wrist following a fall; DEXA scan reveals osteoporosis in lumbar spine and hip. She has been commenced on once weekly Alendronate 70 mg daily and also takes a calcichew tablet.

By what mechanism does the Bisphosphonate function in the treatment of osteoporosis?

- 1- Enhancing the absorption of calcium from the gut
- 2- Enhancing the absorption and action of vitamin D
- 3- Enhancing the survival and function of osteoblasts
- 4- Enhancing the survival and function of osteoclasts
- 5- Reducing the survival and function of osteoclasts

Answer & Comments

Answer: 5- Reducing the survival and function of osteoclasts

Osteoclasts are responsible for bone resorption; therefore by reducing the efficacy of osteoclasts bone turnover is reduced. Bisphosphonates licensed for the prevention and treatment of osteoporosis include Alendronate, Risedronate and Ibandronate. The bisphosphonates Zoledronate and Pamidronate are used for the treatment of metastatic bone disease and short-term management of hypercalcaemia.



[Q: 1271] OnExamination - Clinical pharmacology

A 50-year-old man is being treated for hypertension and has been told that he has gingival hyperplasia by his dentist.

Which of the following medications is the most likely to be the cause?

- 1- Atorvastatin
- 2- Carvedilol
- 3- Doxazosin
- 4- Nifedipine
- 5- Telmisartan

Answer & Comments

Answer: 4- Nifedipine

Three drugs to remember that are associated with gingival hyperplasia are phenytoin, ciclosporin and nifedipine.



[Q: 1272] OnExamination - Clinical pharmacology

A 54-year-old man is found to have a prolonged corrected QT interval on his ECG.

Which of the following drugs is the most likely cause?

- 1- Cefaclor

2- Digoxin

3- Moxonidine

4- Sotalol

5- Telmisartan

Answer & Comments

Answer: 4- Sotalol

Sotalol, amiodarone, Class 1a antiarrhythmic drugs, tricyclic antidepressants, chloroquine and terfenadine are causes of drug-induced long QT.



[Q: 1273] OnExamination - Clinical pharmacology

A 51-year-old female has rheumatoid arthritis. She states that she is allergic to Penicillin and Co-Trimoxazole.

Therefore, which of the following drugs is contraindicated?

- 1- Azathioprine
- 2- Ciclosporin
- 3- Gold therapy
- 4- Methotrexate
- 5- Sulphasalazine

Answer & Comments

Answer: 5- Sulphasalazine

Both co-trimoxazole and sulphasalazine contain sulphonamide groups and hence an allergy to co-trimoxazole would be a contraindication to the use of sulphasalazine. Co-trimoxazole is a mixture of trimethoprim and sulfamethoxazole. Sulphasalazine is a combination of 5-aminosalicylic acid and sulfapyridine.



[Q: 1274] OnExamination - Clinical pharmacology

A 48-year-old lady with a history of epilepsy and ischaemic heart disease presented with

the following Full Blood Count.

Haemoglobin $7.4 \times 10^9/L$ (11.5 - 16.5)

Mean cell volume 125 fL (80 - 96)

White cell count $2.5 \times 10^9/L$ (4 - 11)

Platelet count $130 \times 10^9/L$ (150 - 400)

Which of the following medications is the most likely cause?

- 1- Carbamazepine
- 2- Clopidogrel
- 3- Furosemide
- 4- Phenytoin
- 5- Spironolactone

Answer & Comments

Answer: 4- Phenytoin

There is a macrocytic anaemia with low platelets and WCC typical of a nutritional deficiency. Phenytoin can lead to folate deficiency and is therefore the most likely cause.



[Q: 1275] OnExamination - Clinical pharmacology

A 72-year-old lady presented after taking an overdose of a sustained-release propranolol preparation. She has a pulse of 40 bpm and a BP of 90/60. She was given atropine by the Emergency department staff but there has been little response.

Which of the following is the most appropriate treatment?

- 1- Atropine
- 2- Glucagon
- 3- Haemodialysis
- 4- Noradrenaline
- 5- Salbutamol

Answer & Comments

Answer: 2- Glucagon

"For cases of β -blocker poisoning where symptomatic bradycardia and hypotension are present, high-dose glucagon is considered the first-line antidote."



[Q: 1276] OnExamination - Clinical pharmacology

A young boy is born with a heart murmur that is subsequently diagnosed as Ebstein's anomaly.

Which of the following drugs, taken by the mother, may have contributed to this case of congenital heart disease?

- 1- Amiodarone
- 2- Carbimazole
- 3- Lithium
- 4- Phenytoin
- 5- Warfarin

Answer & Comments

Answer: 3- Lithium

Exposure to Lithium in-utero is associated with Ebstein's anomaly.



[Q: 1277] OnExamination - Clinical pharmacology

Which of the following mechanisms best explains the action of simvastatin?

- 1- Activation of PPAR-alpha
- 2- Bile acid sequestration
- 3- Decreases hepatic cholesterol synthesis
- 4- Increases peroxisomal beta-oxidation of fatty acids
- 5- Inhibits cholesterol absorption

Answer & Comments

Answer: 3- Decreases hepatic cholesterol synthesis

Most circulating cholesterol is manufactured internally, in amounts of about 1000 mg/day, via carbohydrate metabolism through the HMG-CoA reductase pathway. Statins act by competitively inhibiting HMG-CoA reductase, the first committed enzyme of the HMG-CoA reductase pathway.



[Q: 1278] OnExamination - Clinical pharmacology

A 56-year-old female who is taking warfarin for atrial fibrillation and has had a stable INR of between 2-2.5 over the last one year is noted to have an INR on the last visit of 7.8.

Consumption of which of the following may be responsible for this?

- 1- Carrot juice
- 2- Cranberry juice
- 3- Oil of evening primrose
- 4- Orange juice
- 5- St John's wort

Answer & Comments

Answer: 2- Cranberry juice

has been recognised to be responsible for a deranged INR, it being postulated that it inhibits cytochrome p450. St John's wort induces cytoP450 and therefore reduces INR



[Q: 1279] OnExamination - Clinical pharmacology

A 51-year-old man presents with wheals and urticaria. He takes a variety of medications.

Which drug is the most likely to have caused this reaction?

- 1- Aspirin
- 2- Glyceryl trinitrate
- 3- Omeprazole
- 4- Paracetamol
- 5- Simvastatin

Answer & Comments

Answer: 1- Aspirin

The most likely cause of an urticarial eruption from this list would be aspirin. Other drugs frequently associated with urticaria include NSAIDs, penicillin, ACE inhibitors, thiazides and codeine.



[Q: 1280] OnExamination - Clinical pharmacology

There is presently no known effective treatment for a chronic disease. A new treatment is known to be effective in animal models and shows promise in short-term studies in patients. There is some theoretical concerns regarding possible hepato- and bone marrow toxicity although thus far, no toxicity have been observed in studies.

What is the most appropriate next step in the drug's development?

- 1- A case control study
- 2- No further studies should be done and drug development should be stopped
- 3- An open study
- 4- A randomised double blind placebo controlled study
- 5- A randomised single blind placebo controlled study

Answer & Comments

Answer: 4- A randomised double blind placebo controlled study

It appears that the drug has undergone animal testing and we can surmise that it has also been tested on normal volunteers (phase 1) as we are told that it has been tried in short-term studies of patients (phase 2). After this testing process comes phase 3 studies - Broad clinical trials designed to determine whether the drug is of clinical benefit in the disease state. In particular you wish to know whether the drug is effective or not and you wish to know its

safety. A double blind placebo controlled study would be best placed to provide this information.



[Q: 1281] OnExamination - Clinical pharmacology

A 90-year-old man with chronic leukaemia presents with gout which his general practitioner treats with Allopurinol.

How does Allopurinol prevent the accumulation of uric acid?

- 1- By competing for its transporter to the kidney
- 2- By enhancing its solubility
- 3- By inhibiting purine synthesis
- 4- By inhibiting pyrimidine synthesis
- 5- By inhibiting the inflammatory response it causes

Answer & Comments

Answer: 3- By inhibiting purine synthesis

Allopurinol is a xanthine oxidase inhibitor and is converted by this enzyme to alloxanthine in this form it inhibits the conversion of hypoxanthine to xanthine, and the conversion of xanthine to uric acid. Therefore inhibiting the formation of uric acid.



[Q: 1282] OnExamination - Clinical pharmacology

A 16-year-old female is admitted with a severe paracetamol overdose. She is treated with IV N-acetylcysteine.

By replenishing which of the following compounds does N-acetylcysteine function as an antidote in paracetamol overdose?

- 1- Arginine
- 2- Cysteine
- 3- Cystine
- 4- Glutathione

5- Methionine

Answer & Comments

Answer: 4- Glutathione

Paracetamol is predominantly metabolised to glucuronide and sulphate conjugates, which are excreted in the urine. Hepatotoxicity is related to the conversion of a small proportion of the ingested dose to N-acetyl-p-benzoquinoneimine. In therapeutic doses N-acetyl-p-benzoquinoneimine is detoxified by conjugation with glutathione in the liver, but once the protective intracellular glutathione stores are depleted hepatic and renal damage may ensue. and Methionine replenishes glutathione stores in the liver and may also act through its Sulphydryl (-SH) group as a direct reducing agent.



[Q: 1283] OnExamination - Clinical pharmacology

A 48-year-old man is admitted with nausea and excessive drowsiness after taking an antihistamine tablet. He has previously used the antihistamine but on this occasion he has recently been drinking large amounts of grapefruit juice for his health.

Grapefruit juice is suspected of causing a drug interaction in this man.

Which of the following liver enzyme systems is affected by grapefruit juice?

- 1- Cytochrome p450 3A4
- 2- Glycine decarboxylase
- 3- Glucuronidation
- 4- Glutathione S-transferase
- 5- Sulfation

Answer & Comments

Answer: 1- Cytochrome p450 3A4

Bergamottin is a constituent of grapefruit juice and is metabolised by the Cytochrome p450 3A4 pathway.



[Q: 1284] OnExamination - Clinical pharmacology

A 60-year-old lady presented with heartburn. She is known to have osteoporosis and has been taking alendronate for a number of years.

Which of the following is the most likely cause of her symptoms?

- 1- Achalasia
- 2- Calcification of lower oesophageal sphincter
- 3- Crush fracture
- 4- Ischaemic heart disease
- 5- Oesophagitis

Answer & Comments

Answer: 5- Oesophagitis

"Oral bisphosphonates seem to induce serious esophagitis in some patients, may result in gastritis and cause diarrhea. When used as recommended, serious esophageal complications are few. Patients with known esophageal disease (e.g., achalasia, stricture, Barrett's esophagus, severe reflux and scleroderma) should avoid taking oral bisphosphonates." Am Fam Physician 2000;61:2731-6



[Q: 1285] OnExamination - Clinical pharmacology

A 60-year-old man has left ventricular failure and clinically he is classified as NYHA Class III. He takes furosemide, aspirin and ramipril.

The addition of which one of the following betablockers would be expected to further improve his prognosis?

- 1- Acebutolol
- 2- Bisoprolol

- 3- Esmolol
- 4- Propranolol
- 5- Sotalol

Answer & Comments

Answer: 2- Bisoprolol

Bisoprolol is a highly selective beta(1)-adrenoceptor antagonist. Administration of bisoprolol to patients with chronic heart failure is associated with increases in left ventricular function and reductions in heart rate; increases in heart rate variability are also seen. Two major randomised, double-blind, placebo-controlled, multicentre trials have examined the clinical efficacy of bisoprolol in combination with ACE inhibitors and diuretics in patients with stable chronic heart failure (New York Heart Association class III or IV).



[Q: 1286] OnExamination - Clinical pharmacology

A 55-year-old woman is attending clinic a number of months after having had a myocardial infarction. She has been commenced on appropriate drugs to reduce cardiovascular risk and has made dietary modifications for healthy living. Recently, however, she complains of muscle aches and pains and is found to have an elevated CPK.

Consumption of which of the following is likely to have contributed to increased statin-associated myotoxicity?

- 1- Carrot juice
- 2- Cranberry juice
- 3- Garlic cloves
- 4- Grapefruit juice
- 5- Omega-3 fish oils

Answer & Comments

Answer: 4- Grapefruit juice

Grapefruit juice significantly increases serum concentrations of some statins. This is achieved by reducing the CYP3A4-mediated first-pass metabolism in the small intestine. On the other hand, grapefruit juice has no effect on the pharmacokinetics of pravastatin, Rosuvastatin and fluvastatin. Concomitant use of atorvastatin and large amounts of grapefruit juice should be avoided, or the dose of atorvastatin should be reduced accordingly. CYP3A4 is a member of the cytochrome P450 system. (Clin Pharmacol Ther 1999;66:118-27. Cranberry juice may speed up metabolism of liver enzymes and hence may cause problems with reduced warfarin efficacy.



[Q: 1287] OnExamination - Clinical pharmacology

A 48-year-old lady with Addison's disease presented in a small peripheral clinic. She says that she has run out of her hydrocortisone and she usually takes 20 mg in the morning and 10 mg in the evening. No hydrocortisone is available at the clinic but you do have prednisolone which you would like to prescribe instead until a prescription of hydrocortisone can be dispensed.

What is the equivalent daily dose of prednisolone?

- 1- 2.5 mg
- 2- 5 mg
- 3- 7.5 mg
- 4- 10 mg
- 5- 20 mg

Answer & Comments

Answer: 3- 7.5 mg

1 mg is equivalent to 4 mg hydrocortisone so this lady should be given 7.5 mg. If 2.5 mg tablets were not available (to go with a 5 mg tablet to make 7.5 mg tablet) then 10 mg would be fine. It is better to overdose rather

than under-dose especially where there is stress or illness.



[Q: 1288] OnExamination - Clinical pharmacology

A 68-year-old lady presents to her GP for an annual review of her heart failure treatment. She has a blood pressure of 165/90. She is currently taking furosemide and aspirin and she dyspnoea on walking up hills..

Which of the following is the most appropriate medication to add?

- 1- Bendroflumethiazide
- 2- Enalapril
- 3- Isosorbide mononitrate
- 4- Spironolactone
- 5- Titrate dose of furosemide

Answer & Comments

Answer: 2- Enalapril

ACE inhibitors remain one of the cornerstones of the treatment of heart failure [SOLVD and CONSENSUS trials]. There is clear evidence that higher doses exert greater benefit. They are usually very well tolerated, especially in milder cases. ()



[Q: 1289] OnExamination - Clinical pharmacology

Which one of the following drugs works by inhibiting the tumour necrosis factor?

- 1- cyclosporin
- 2- infliximab
- 3- methotrexate
- 4- montelukast
- 5- sulphasalazine

Answer & Comments

Answer: 2- infliximab

Montelukast works as leukotriene receptor antagonists, and is used in treatment of asthma. Etanercept and infliximab inhibit TNF and are licensed in the treatment of rheumatoid arthritis. Infliximab is given with methotrexate and is associated with development of tuberculosis.



[Q: 1290] OnExamination - Clinical pharmacology

An 18-year-old woman is admitted after taking drugs at a night-club.

Which of the following features suggest she had taken Ecstasy (MDMA)?

- 1- A pyrexia of 40oC
- 2- hypernatraemia
- 3- hypokalaemia
- 4- metabolic acidosis
- 5- respiratory depression

Answer & Comments

Answer: 1- A pyrexia of 40oC

Hyponatraemia, tachycardia, hyperventilation and hyperthermia are features of the amphetamine MDMA abuse.



[Q: 1291] OnExamination - Clinical pharmacology

A 72-year-old man presents with painful lumps in his feet and is diagnosed with gout. Following initial treatment with non-steroidal anti-inflammatory agents he is started on Allopurinol.

How does this work?

- 1- Inhibits macrophage tubular formation
- 2- Inhibits cyclooxygenase II
- 3- Inhibits nitric oxide synthase
- 4- Inhibits xanthine oxidase
- 5- Increases urinary uric acid excretion

Answer & Comments

Answer: 4- Inhibits xanthine oxidase

Allopurinol inhibits xanthine oxidase, the enzyme involved in the conversion of purines into uric acid.



[Q: 1292] OnExamination - Clinical pharmacology

A 70-year-old man presented with increasing dyspnoea. In his history, he had suffered a myocardial infarction two years previously which had been complicated by ventricular arrhythmias. At admission his oxygen saturations were 85% on air and a chest X-ray revealed bilateral patchy infiltration of both lung fields with a cardiothoracic ratio of 20/30 cm.

Which of the following drugs that he has been prescribed is most likely to explain these findings?

- 1- Amiodarone
- 2- Atorvastatin
- 3- Aspirin
- 4- Furosemide
- 5- Ramipril

Answer & Comments

Answer: 1- Amiodarone

This patient has desaturation with patchy infiltration on CXR suggesting a diagnosis of amiodarone-induced lung disease. Usually the presentation is insidious and the disorder associated with the cumulative dose. Treatment depends on withdrawing amiodarone and initiation of steroid therapy. Differential diagnosis is any lymphangitis/pneumonitis but High resolution CT can help by demonstration of radio-dense plaques etc.



[Q: 1293] OnExamination - Clinical pharmacology

A 52-year-old female with a three year history of sero-positive erosive rheumatoid arthritis has recently commenced methotrexate therapy initiated at the rheumatology clinic.

Which of the following agents should she also be receiving in conjunction with her Methotrexate?

- 1- Folic acid
- 2- Omeprazole
- 3- Thiamine
- 4- Vitamin C
- 5- Zinc supplements

Answer & Comments

Answer: 1- Folic acid

Methotrexate is a chemotherapeutic agent as well as being an immunosuppressant used as a DMARD. It acts through inhibition of dehydrofolate reductase thus depleting folate concentrations. To reduce the impact of folate deficiency, a dose of 5mg of folic acid weekly* is recommended in conjunction with methotrexate taking the agent at least two days prior to commencing the methotrexate. Its action in arthritides is not entirely understood but may relate to both anti-inflammatory as well as immunomodulation.

*Some local variations may exist regarding dose and frequency of folate therapy. Please be aware of your local guidelines.



[Q: 1294] OnExamination - Clinical pharmacology

A 60-year-old male who has been prescribed lisinopril for hypertension presents with an irritating cough.

What is the mechanism responsible for ACE-induced cough?

- 1- Angiotensin I accumulation

- 2- Asthma
- 3- Bradykinin accumulation
- 4- Laryngeal irritation
- 5- Renin accumulation

Answer & Comments

Answer: 3- Bradykinin accumulation

The enzyme ACE is also responsible for the metabolism of bradykinin in mast cells. The accumulation of this substance is responsible for the cough found in up to 30% of subjects taking ACE-inhibitors. This phenomenon is not seen in subjects taking Angiotensin receptor blockers such as Losartan.



[Q: 1295] OnExamination - Clinical pharmacology

A 46-year-old male was seen for an insurance medical examination. He was entirely asymptomatic, but his serum urate concentration was noted to be 0.5 mmol/L (0.23 - 0.46).

What is the most appropriate management for this patient?

- 1- Allopurinol
- 2- Colchicine
- 3- Ibuprofen
- 4- Lifestyle intervention
- 5- Sulphinpyrazone

Answer & Comments

Answer: 4- Lifestyle intervention

This asymptomatic patient requires only lifestyle advice i.e weight loss if appropriate, an appropriate diet and reduction of alcohol.



[Q: 1296] OnExamination - Clinical pharmacology

A 45-year-old male attends for an insurance medical and is in good health. Examination

was normal but investigations reveal that he has a serum urate concentration of 0.55 mmol/l (NR 0.25-0.45).

Which of the following is the most appropriate management for this patient?

- 1- Lifestyle advice
- 2- Start Allopurinol
- 3- Start Colchicine
- 4- Start Diclofenac
- 5- Start Prednisolone

Answer & Comments

Answer: 1- Lifestyle advice

The most appropriate treatment for this asymptomatic man with an isolated slightly elevated urate is lifestyle advice with an appropriately reduced purine diet, increased exercise and reduced alcohol consumption.



[Q: 1297] OnExamination - Clinical pharmacology

A 17-year-old female presents with acute breathlessness. She has had asthma for approximately 3 years and recently commenced new therapy.

Which agent may be responsible for this exacerbation?

- 1- Salmeterol
- 2- Theophylline
- 3- Beclomethasone
- 4- Ipratropium bromide
- 5- Monteleukast

Answer & Comments

Answer: 1- Salmeterol

Salmeterol has been reported to produce an acute exacerbation of asthma, possibly through an acute hypersensitivity reaction.



[Q: 1298] OnExamination - Clinical pharmacology

You are asked to advise on analgesia for a 44-year-old woman with acute intermittent porphyria who has undergone wisdom teeth extraction.

Which of the following drugs is safe for use in her treatment?

- 1- Cephalexin
- 2- Cetirizine
- 3- Diclofenac
- 4- Erythromycin
- 5- Ibuprofen

Answer & Comments

Answer: 5- Ibuprofen

Many drugs may induce acute porphyric crises, thus great care must be taken when prescribing for patients with acute porphyria. Drugs unsafe for use in acute porphyria include barbiturates, tricyclic antidepressants, MAOIs, amphetamines, anabolic steroids, hormone replacement therapy, benzodiazepines, diuretics, captopril, cephalosporins, erythromycin, isoniazid, sulphonamides, sulphonylureas, theophylline, antihistamines, nifedipine, verapamil, amiodarone and simvastatin. Ibuprofen is safe for use in acute intermittent porphyria, but diclofenac should be avoided.



[Q: 1299] OnExamination - Clinical pharmacology

Hypomagnesaemia may be caused by which of the following drugs?

- 1- Aminophylline
- 2- Cisplatin
- 3- Co-trimoxazole
- 4- Digoxin
- 5- Amitriptyline

Answer & Comments

Answer: 2- Cisplatin

Thiazide diuretics (not mentioned here) are a common cause of reduced serum magnesium. Cisplatin is a well recognised cause of hypomagnesaemia.



[Q: 1300] OnExamination - Clinical pharmacology

The following are causes of drug induced hepatitis except:

- 1- Amiodarone
- 2- Ethambutol
- 3- Isoniazid
- 4- Methyldopa
- 5- Pyrazinamide

Answer & Comments

Answer: 2- Ethambutol

Side effects of ethambutol are largely confined to visual disturbances in form of loss of acuity, colour blindness and restriction of visual fields. It does not cause hepatitis and is renally excreted. Isoniazid, amiodarone, pyrazinamide and methyldopa are a cause of drug induced hepatitis.



[Q: 1301] OnExamination - Clinical pharmacology

A 45-year-old female presents with a 6 month history of exertional dyspnoea and is diagnosed with pulmonary fibrosis. Over the last one year she has received a variety of medications.

Which of the following drugs could be responsible?

- 1- Dexamethasone
- 2- Ibuprofen
- 3- nalidixic acid
- 4- penicillamine

5- sulphasalazine

Answer & Comments

Answer: 5- sulphasalazine

Sulphasalazine as well as other rheumatology drugs such as Gold, Methotrexate can cause pulmonary fibrosis. Bleomycin and Cyclophosphamide rather than vincristine may be responsible. Corticosteroids are sometimes given as a trial in pulmonary fibrosis. Nalidixic acid is associated with seizures and visual disturbances. However nitrofurantoin is well recognised to cause PF.

Other drugs include amiodarone and nitrofurantoin



[Q: 1302] OnExamination - Clinical pharmacology

A study has been designed to investigate whether a certain drug plus physiotherapy treatment is better than drug treatment alone in the management of rheumatoid arthritis. After randomizing the patients a small proportion of the drug plus physiotherapy group decide to drop out of the study or omit some treatment sessions specified in the research protocol.

What is the correct way of analysing the subsequent data?

- 1- Assume the patients have withdrawn their consent
- 2- Exclude these patients from all analysis
- 3- Extend the trial recruitment to make up the numbers
- 4- Include these patient outcomes in the drug plus physiotherapy group
- 5- Interview the patients and report their group separately

Answer & Comments

Answer: 4- Include these patient outcomes in the drug plus physiotherapy group

This is the principle of 'intention to treat'. It is possible that the physiotherapy intervention was harmful to the patients and this is why they left. Intention to treat helps to reduce bias by sticking to the original allocation of treatment and analyzing the patient in that treatment group even (and concentrate for this bit) even if they don't get it!



[Q: 1303] OnExamination - Clinical pharmacology

A 63-year-old female presents with dry mouth of 3 months duration. She is taking medication for hypertension, stress incontinence and reflux oesophagitis.

Which of the following may be responsible for her dry mouth?

- 1- Oxybutinin
- 2- Doxazosin
- 3- Hydrallazine
- 4- Cimetidine
- 5- Bendroflumethiazide

Answer & Comments

Answer: 1- Oxybutinin

Oxybutinin is an effective treatment for detrusor instability and is a parasympathetic muscarinic antagonist. Consequently dry mouth is a problem in up to 70% of cases. Bendroflumethiazide, the thiazide diuretic, at a dose of 2.5 mg per day is not associated with dry mouth. Cimetidine is a H₂ antagonist and is not associated with dry mouth.



[Q: 1304] OnExamination - Clinical pharmacology

With regard to poisoning / overdose:

- 1- Phenobarbitone causes a metabolic acidosis
- 2- Ethylene glycol causes a metabolic alkalosis and renal failure

3- Aspirin causes acidosis due to hypoventilation

4- Methanol causes a metabolic acidosis with an increased anion gap

5- Chlormethiazole causes hyperthermia and hypertension

Answer & Comments

Answer: 4- Methanol causes a metabolic acidosis with an increased anion gap

Aspirin causes hyperventilation which may result in a respiratory alkalosis, massive overdose may cause a metabolic acidosis. Phenobarbitone & Chlormethiazole both suppress the CNS causing hypoventilation, hypotension & hypothermia. Ethylene glycol causes a metabolic acidosis. Methanol is metabolised to formaldehyde and formic acid.



[Q: 1305] OnExamination - Clinical pharmacology

A 48-year-old female with rheumatoid arthritis has the following full blood count results:

Haemoglobin 11.4 g/dl (12-16.5)

Platelets 470 x 10⁹/L (150-450)

White Cell Count 9.0 x 10⁹/L (4-10)

MCV 102 fl (83-95)

Which drug is she likely to be taking?

- 1- Ciclosporin
- 2- Hydroxychloroquine
- 3- Leflunomide
- 4- Methotrexate
- 5- Mycristin

Answer & Comments

Answer: 4- Methotrexate

Leflunomide is associated rarely with anaemia, thrombocytopenia and eosinophilia. Ciclosporin may be associated

with a mild anaemia. Methotrexate may be associated with haematopoietic suppression, leading to profound, and sometimes sudden leucopenia and thrombocytopenia.

Methotrexate may lead to macrocytosis as a result of B12 or folate deficiency. Myocristin may also rarely lead to blood disorders, pancytopenia and leucopenia. The elevated platelet count here probably relates to the rheumatoid arthritis itself.



[Q: 1306] OnExamination - Clinical pharmacology

In which of the following have randomised controlled trials shown that long-term oxygen therapy (LTOT) reduces mortality?

- 1- Asthma
- 2- Cor pulmonale due to chronic airflow obstruction
- 3- Cryptogenic fibrosing alveolitis
- 4- Cystic fibrosis
- 5- Pulmonary sarcoidosis

Answer & Comments

Answer: 2- Cor pulmonale due to chronic airflow obstruction

Adequate data for LTOT prolonging survival exists only for COPD although in practice it is assumed to apply in other chronic hypoxaemic lung conditions.



[Q: 1307] OnExamination - Clinical pharmacology

Which of the following most accurately describes the mechanism of action of the bisphosphonates?

- 1- Calcium resorption in the distal tubule
- 2- Fibroblast proliferation in bone marrow
- 3- Improved vascular supply to bone marrow
- 4- Inhibition of osteoclast activity

- 5- Upregulation of osteoblast activity

Answer & Comments

Answer: 4- Inhibition of osteoclast activity

The mechanism of action of alendronate and risedronate, as well as newer

agents, involves the inhibition of the pathway that leads to the production of certain essential lipid compounds inside osteoclasts, resulting in a series of events leading to decreased osteoclast activity and to the induction of cell death



[Q: 1308] OnExamination - Clinical pharmacology

A new drug is being studied to find the most appropriate dose in a dose response study. Small doses of the drug lead to a linear increase in serum drug concentration. At higher doses there is an exponential rise in serum drug concentration.

Which of the following best describes the pharmacokinetic properties of this new drug?

- 1- first order kinetics [25]
- 2- first pass effect
- 3- long plasma half life
- 4- saturation kinetics
- 5- zero order kinetics [25]

Answer & Comments

Answer: 4- saturation kinetics

The description of the kinetics of this new drug show that with small doses there is a linear response (first order kinetics) to dosing but this becomes saturated and the serum concentration of the drug rises sharply (zero order kinetics). This response is typical of drugs such as phenytoin (saturates liver metabolism).



[Q: 1309] OnExamination - Clinical pharmacology

Lead poisoning:

- 1- Causes adrenal suppression
- 2- Can only result from lead ingestion
- 3- Is associated with a macrocytic anaemia
- 4- Causes a peripheral neuropathy due to demyelination
- 5- Commonly presents with diarrhoea

Answer & Comments

Answer: 4- Causes a peripheral neuropathy due to demyelination

Lead can also be absorbed through the skin and by inhalation. Associated with iron deficiency & a microcytic anaemia. Most common GI symptoms are abdominal colic and constipation.



[Q: 1310] OnExamination - Clinical pharmacology

A 29-year-old man who is a keen amateur photographer with his own development studio presented to the Emergency department with confusion. His partner said he had been under a great deal of stress recently and she found him foolishly drinking a developer solution with a poison symbol on it. He is hypoxic and hypotensive. The local poisons unit suggests a diagnosis of cyanide poisoning.

Which of the following would be the most appropriate treatment?

- 1- Desferrioxamine
- 2- Dicobalt EDTA
- 3- Gastric lavage with Fuller's earth
- 4- Haemodialysis
- 5- Penicillamine

Answer & Comments

Answer: 2- Dicobalt EDTA

Potassium ferricyanide is used chiefly for blueprints, in photography, for staining wood, in calico printing, and in electroplating.

Kelocyanor (dicobalt EDTA), given by intravenous injection, has been proven to be of use when administered to seriously ill victims of confirmed cyanide poisoning. It is itself toxic, however, and can kill if used wrongly. HSE knows of several cases of inappropriate use resulting in hospital treatment. Its administration is beyond the scope of first aid and a recommendation has been made in the past that a 'Kelocyanor kit' should be kept by users of cyanide and transported to hospital with the patient. Unfortunately we are aware of cases where this has misled doctors to treat patients for cyanide poisoning when this diagnosis was not correct.



[Q: 1311] OnExamination - Clinical pharmacology

A farmer, on treatment for depression is admitted acutely 1 hour following an intentional overdose of an unidentified substance. On examination he is bradycardic, hypotensive, disorientated, hypersalivating, and has small pupils.

He has most likely ingested :

- 1- Paracetamol
- 2- A tricyclic anti-depressant
- 3- Paraquat
- 4- An organophosphate insecticide
- 5- Cyanide

Answer & Comments

Answer: 4- An organophosphate insecticide

Hypersalivation and miosis are the specific clues to acetylcholine overactivity.

Occupational access to organophosphate insecticides. Pupils tend to be dilated with TCA OD. Paracetamol, cyanide, and paraquat shouldn't affect pupils.



[Q: 1312] OnExamination - Clinical pharmacology

A 35-year-old man is admitted following a serious attempt of paracetamol overdose. Despite efforts to treat him he develops liver failure.

Which of the following is most likely with the ensuing liver failure?

- 1- It is harmful to give N-acetylcysteine
- 2- better prognosis in those with high alcohol consumption
- 3- hypoglycaemia rarely happens within 12 hours of onset of encephalopathy
- 4- lactic acidosis is recognised complication
- 5- better prognosis in older patients

Answer & Comments

Answer: 4- lactic acidosis is recognised complication

Use of intravenous N-acetylcysteine reduces morbidity and mortality in fulminant hepatic failure. Severe hypoglycaemia affects 40% of patients with fulminant liver failure, which exacerbates encephalopathy. It may develop rapidly and recur with sepsis. Lactic acidosis due to decreased hepatic lactate clearance, compounded by poor peripheral perfusion and increased lactate production. Poor prognosis in those with blood pH<7.0, prolonged prothrombin time (>100s) and serum creatinine >300uM. Mortality is greater if patient > 40 years of age.



[Q: 1313] OnExamination - Clinical pharmacology

A 63-year-old man was found collapsed. A Department of Psychiatry outpatient Card was

found in his jacket, together with a bottle of procyclidine tablets. He was febrile (38.2°C), conscious but unresponsive to commands. The blood pressure was 160/105 mmHg and there was marked muscle rigidity.

What is the most likely diagnosis?

- 1- acute catatonic schizophrenia
- 2- bacterial meningitis
- 3- cerebral malaria
- 4- neuroleptic malignant syndrome
- 5- procyclidine overdose

Answer & Comments

Answer: 4- neuroleptic malignant syndrome

The symptoms are typical of neuroleptic malignant syndrome (NMS). NMS is characterized by fever, muscular rigidity, altered mental status, and autonomic dysfunction. Procyclidine is used to treat the Parkinsonian side-effects of neuroleptics: its presence in the patient's pocket implies that he was taking neuroleptics. Signs of procyclidine overdose include agitation, confusion, and sleeplessness lasting up to 24 hours or more. Pupils are dilated and unreactive to light. Visual and auditory hallucinations and tachycardia have also been reported.



[Q: 1314] OnExamination - Respiratory

A 40-year-old worker presents with wheezing and breathlessness which seem to improve over weekends and holiday periods when he is not working.

What is he most likely to be exposed to at work?

- 1- Platinum salts
- 2- Avian bloom
- 3- Aspergillus clavatus
- 4- Work in the Silver industry
- 5- Exposure to spores of Actinomyces

Answer & Comments

Answer: 1- Platinum salts

Disinfectants and preservatives including glutaraldehyde, chlorhexidine and formaldehyde can cause occupational asthma. Metals causing occupational asthma include isocyanates cobalt, aluminium, chrome, manganese, nickel, zinc, and platinum. Exposure to Actinomyces (farmer's lung, mushroom workers' lung), avian bloom (bird fanciers' lung) and aspergillus clavatus (malt worker's lung) cause extrinsic allergic alveolitis.



[Q: 1315] OnExamination - Respiratory

Which of the following statements regarding cryptogenic fibrosing alveolitis is correct?

- 1- Active inflammation may be suggested by a CT scan
- 2- peak flow rate is a good guide to severity
- 3- 80 per cent of patients initially respond well to immunosuppression
- 4- peak incidence seen in the fourth decade
- 5- lung volumes show a raised residual volume / total lung capacity ratio

Answer & Comments

Answer: 1- Active inflammation may be suggested by a CT scan

a - also the presence of a predominantly ground glass appearance is an independent predictor of survival.

b - Peak flow measure airway obstruction. CFA is characterised by a restrictive defect on lung function testing.

c - About 50% of patients have an improvement in their symptoms with steroids and 25% have improved lung function.

d - peak incidence is in the 6th decade

e - residual volume (RV) increases with airways obstruction, total lung capacity (TLC) reduces with restrictive disorders like CFA. A raised RV/TLC ratio suggests a combination of airways obstruction and restrictive defect NOT just CFA as mentioned in this question.



[Q: 1316] OnExamination - Respiratory

Which of the following statements is NOT true of primary pulmonary tuberculosis:

- 1- It is characteristically asymptomatic
- 2- Miliary spread is commoner in a younger age group
- 3- The initial immunological response causes hilar lymphadenopathy
- 4- pleural effusion occurs before tuberculin skin testing is positive
- 5- A positive tuberculin skin test develops within two weeks of infection

Answer & Comments

Answer: 5- A positive tuberculin skin test develops within two weeks of infection

Primary TB is usually asymptomatic, with miliary TB most likely to occur in young children. The Ghon focus is the area of

consolidation from cellular infiltration and response to uptake of organisms by macrophages, which transform into epithelioid cells and group into granulomata. Bacilli are transported via lymphatics early in disease process to regional lymph nodes to cause marked lymphadenopathy. Positive tuberculin test occurs between 3 weeks to 3 months after primary infection. Pleural and pericardial infections occur at or shortly after primary infection.



[Q: 1317] OnExamination - Respiratory

A lifelong non-smoker is diagnosed with emphysema.

Which of the following would be the most likely aetiological agent ?

- 1- Isocyanates
- 2- Cadmium Exposure
- 3- Steel
- 4- Zinc
- 5- Asbestos

Answer & Comments

Answer: 2- Cadmium Exposure

Cadmium fume inhalation is a recognised cause of emphysema. Other industrial associations with COPD include coal, cotton, grain and cement.



[Q: 1318] OnExamination - Respiratory

In restrictive lung disease due to respiratory muscle weakness, which of the following statements is true?

- 1- Low FEV₁/FVC, high RV/TLC
- 2- Low FEV₁/FVC, normal TLC
- 3- Low VC, low FEV₁, normal TLC, low RV/TLC
- 4- Low VC, low RV, low TLC
- 5- Low VC, low TLC, high RV/TLC

Answer & Comments

Answer: 5- Low VC, low TLC, high RV/TLC

The lung is itself can function normally yet muscle weakness will result in grossly low lung volumes including FEV₁, FVC and TLC. However residual volume will be relatively high as a consequence of this weakness. Consequently, RV/TLC will be elevated. However the transfer of carbon monoxide (TCO) will be unaffected.



[Q: 1319] OnExamination - Respiratory

Which of the following is found in subjects acclimatised to life at high altitudes ?

- 1- Increased mean corpuscular haemoglobin concentration
- 2- Increased pulmonary artery pressure
- 3- Periodic respiration
- 4- Reduced cardiac output
- 5- Reduced airway resistance

Answer & Comments

Answer: 2- Increased pulmonary artery pressure

discriminating question! Acclimatisation results in increased Hb with erythrocytosis. Periodic respiration is a feature of non-acclimatisation. Respiration is normal when subjects are acclimatised to altitude as is cardiac output. Pulmonary artery pressure increases in an effort to oxygenate more blood. 2,3-DPG increases.



[Q: 1320] OnExamination - Respiratory

A 36-year-old man complains of a persistent cough. A CXR shows fibrosis of both upper lobes.

What is the most likely diagnosis?

- 1- Systemic Sclerosis
- 2- Primary Pulmonary Hypertension

- 3- Cystic Fibrosis
- 4- Ankylosing Spondylitis
- 5- Allergic bronchopulmonary aspergillosis

Answer & Comments

Answer: 5- Allergic bronchopulmonary aspergillosis

The persistent cough is likely to be a symptom of asthma. On the other hand, only about 1% of patients with advanced ankylosing spondylitis develop apical fibrosis ie rare . Even then, early lesions are asymptomatic. It is when only when cavitation develops that symptoms like cough, infected sputum and haemoptysis start. With ABPA, fibrosis and loss of volume in the upper lobes are common. Within these upper lobes, there may be bronchiectasis.



[Q: 1321] OnExamination - Respiratory

Which of the following is a typical feature of Farmer's lung?

- 1- basal crackles
- 2- Eosinophilia
- 3- Haemoptysis
- 4- Increased pCO₂
- 5- Positive serum paraproteins

Answer & Comments

Answer: 1- basal crackles

Commonest occupational extrinsic allergic alveolitis, due to thermophilic actinomycetes. Crackles are typically heard at the bases. Eosinophilia can be seen but is not typical. Immunoglobulin levels are frequently elevated but not a paraprotein. P_{O2} may be decreased particularly with exercise. A restrictive pattern on LF studies is seen.



[Q: 1322] OnExamination - Respiratory

A 25-year-old male presents to A+E with shortness of breath. One week ago, he developed influenza and has become more short of breath and fatigued in the last 24 hours. His temperature is 38.5°C, his SaO₂ is 90% on 2L of oxygen, a blood pressure 100/60 mmHg and heart rate 120/min. The CXR shows patchy consolidation.

Which antibiotic therapy should you select for this man?

- 1- Amoxicillin
- 2- Amoxicillin and Flucloxacillin
- 3- Amoxicillin and Gentamicin
- 4- Amoxicillin and Rifampicin
- 5- Flucloxacillin

Answer & Comments

Answer: 2- Amoxicillin and Flucloxacillin

Patients who present with pneumonia after influenzae or measles are at risk of Staphylococcal pneumonia. Look for cavitation on the CXR. The BTS guidelines: state that amoxicillin should be first line therapy for all pneumoniae, with the addition of flucloxacillin if there is risk of it being staphylococcal. Gentamicin may be indicated in severe hospital acquired pneumonia, and rifampicin in severe atypical infections (e.g. legionella).



[Q: 1323] OnExamination - Respiratory

Which of the following is NOT true with regard to the radiological appearance of a chest X-ray?

- 1- Consolidation of the right middle lobe will obliterate the right atrial shadow in the PA view
- 2- Consolidation of the right apical segment will extend to the horizontal fissure in the PA view

- 3- Consolidation of the right anterior segment of the right middle lobe will extend to the right transverse fissure and the right hilum in PA view
- 4- Consolidation of the lingular lobe will obliterate the aortic knuckle and pulmonary trunk in the PA view
- 5- Consolidation of the left lower lobe will elevate the left hemidiaphragm

Answer & Comments

Answer: 5- Consolidation of the left lower lobe will elevate the left hemidiaphragm

Consolidation in left lower lobe obliterates the diaphragm, whilst lingular consolidation will obliterate the left heart border. Oblique fissure runs obliquely at 45° from T4 or 5 vertebra to anterior costophrenic angle on lateral chest film. The horizontal fissure runs from the hilum anteriorly to anterior chest wall. The area above the horizontal fissure is upper lobe, below the horizontal fissure is the middle lobe and below the oblique fissure is the lower lobe.



[Q: 1324] OnExamination - Respiratory

A 25-year-old woman is admitted with a 4-month history of cough productive of mucoid sputum streaked with bright red blood, wheezing and diarrhoea. Her chest and abdominal examination is normal.

Which of the following investigation is the most discriminatory?

- 1- Bronchoscopy
- 2- Chest X-ray
- 3- Computed tomography (CT) of chest
- 4- Echocardiogram
- 5- Ventilation-perfusion scan

Answer & Comments

Answer: 1- Bronchoscopy

Bronchial carcinoid is a highly vascular 'cherry-like' tumour causing recurrent haemoptysis and bronchial obstruction. It may rarely produce the classical symptoms of carcinoid syndrome such as cyanotic flushings, intestinal cramps and diarrhoea following liver metastases in 5% cases. Bronchoscopy identifies up to 80% of carcinoid tumours in the main bronchi. Biopsy is usually followed with brisk bleeding and should be done via rigid bronchoscopy.



[Q: 1325] OnExamination - Respiratory

A 29-year-old professional singer presents with a prolonged history of epistaxis and rapidly progressive shortness of breath. The KCO and eosinophil count are raised.

Which of the following is the most likely diagnosis?

- 1- Goodpasture's syndrome
- 2- Microscopic polyangiitis
- 3- Churg-Strauss syndrome
- 4- Wegener's granulomatosis
- 5- Alveolar proteinosis

Answer & Comments

Answer: 4- Wegener's granulomatosis

The patient with breathlessness and a raised KCO has alveolar haemorrhage until proven otherwise. A prolonged history of epistaxis or sinusitis is commonly found in Wegener's granulomatosis, which in some patients is also associated with an eosinophilia. A history of asthma must usually be present to diagnose the Churg-Strauss syndrome.



[Q: 1326] OnExamination - Respiratory

An 18-year-old female with alpha1-antitrypsin deficiency attends clinic 12 weeks pregnant.

She wants to know if her child would be affected.

What is the mode of inheritance of this disease?

- 1- Autosomal dominant
- 2- X-linked recessive
- 3- Autosomal recessive
- 4- Polygenic
- 5- X-linked dominant

Answer & Comments

Answer: 3- Autosomal recessive

Alpha-1-antitrypsin deficiency is inherited in an autosomal recessive pattern, which causes emphysema and cirrhosis and has a prevalence of 1 in 2500.



[Q: 1327] OnExamination - Respiratory

Which ONE of the following is correct regarding severe bullous emphysema:

- 1- Helium dilution is more accurate than body plethysmography in measuring residual volume.
- 2- Hypoxaemia at rest will improve with exercise.
- 3- Pulmonary compliance is reduced.
- 4- Reduced elastic recoil opposes airway collapse in expiration.
- 5- The carbon monoxide transfer factor is reduced.

Answer & Comments

Answer: 5- The carbon monoxide transfer factor is reduced.

" Whole body plethysmography also measures trapped gas ie intrathoracic gas (including within bullae and other poorly ventilated areas) which barely communicates with the airway. Standard gas-dilution

measures gas that communicates with the airway. Mixing in helium dilution is more difficult in airways obstruction requiring multibreath methods lasting 5 minutes rather than single breath test.

" Exertion will exacerbate breathlessness and hypoxia.

" The characteristic changes of severe emphysema are increase in static compliance and reduction in lung recoil pressure.

" Loss of lung recoil causes a reduction of alveolar pressure (elastic recoil pressure of lung + pleural pressure) leading to collapse of peripheral airways on expiration. Emphysematous patients purse their lips in expiration to increase airway pressure to prevent this collapse.

" CO transfer factor is reduced.



[Q: 1328] OnExamination - Respiratory

A 56-year-old man presents with night time sweats, nocturia, poor concentration and day time somnolence.

To which of the following conditions does this diagnosis predispose?

- 1- Hypoglycaemia
- 2- Hypotension
- 3- Insulin sensitivity
- 4- Osteoporosis
- 5- Stroke

Answer & Comments

Answer: 5- Stroke

This history is typical of sleep apnoea. Sleep apnoea is an independent risk factor for stroke (and death from all causes), and is associated with hypertension, IGT, and insulin resistance.



[Q: 1329] OnExamination -
Respiratory

A 41-year-old man with a history of nasal congestion, breathlessness, cough and wheeze presents with a left foot drop.

Which of the following is the most likely diagnosis?

- 1- Diabetes mellitus
- 2- Wegeners Granulomatosis
- 3- Churg Strauss Syndrome
- 4- Pulmonary eosinophilia
- 5- Polyarteritis Nodosa

Answer & Comments

Answer: 3- Churg Strauss Syndrome

Churg Strauss syndrome is an eosinophilic vasculitis involving small and medium sized arteries and veins. It has three progressive phases; the first prodromal phase is of asthma and rhinitis, the second of tissue and peripheral blood eosinophilia and the final phase of systemic vasculitis. Asthma may precede the onset of vasculitis by many years although all three phases can occur together. Peripheral nervous system involvement usually takes the form of a mononeuritis multiplex or a mixed sensory and motor polyneuritis.



[Q: 1330] OnExamination -
Respiratory

Which of the following is NOT employed in the laboratory diagnosis of respiratory viral infections?

- 1- Immunofluorescence
- 2- Tissue culture
- 3- Haemagglutination
- 4- ELISA
- 5- Single radial haemolysis (SRH)

Answer & Comments

Answer: 5- Single radial haemolysis (SRH)

Rapid antigen-detection kits utilizing direct immunofluorescence are used to demonstrate RSV, influenza, parainfluenza and adenovirus in respiratory secretions. Respiratory viruses can be grown in various cell lines e.g. HeLa cells or fibroblasts. Influenza is a haemagglutinating virus as red cells stick to the infected cells after addition to the culture. ELISA is used to look for antibodies in acute and convalescent sera. The SRH test is used to screen for rubella antibodies in pregnant women.



[Q: 1331] OnExamination -
Respiratory

An 18-year-old attending the A+E department is noted to have central cyanosis. She is perfectly well but was told to go to A+E by her friends who said she looked blue.

What is the most likely cause?

- 1- Carbon Monoxide Poisoning
- 2- Lead Poisoning
- 3- Drinking water contaminated with nitrates
- 4- Anorexia Nervosa
- 5- Severe Anaemia

Answer & Comments

Answer: 3- Drinking water contaminated with nitrates

This is typical of methaemoglobinaemia which may be caused by nitrates.



[Q: 1332] OnExamination -
Respiratory

A 7 month old boy is presented to a doctor by his parents with symptoms of recurrent upper respiratory tract infections. No other members of the family suffer from any similar

infections. Physical examination showed mild facial hypoplasia.

Biochemistry investigations revealed hypocalcaemia. Microbiological investigations were normal and immunoglobulins were within normal limits.

The infants immune function would show the following deficiency:

- 1- Complement Deficiency
- 2- B cell number and function
- 3- T cell number and function
- 4- Plasma Cell
- 5- Macrophage number and function

Answer & Comments

Answer: 3- T cell number and function

This child suffers from DiGeorges syndrome. Patients with DiGeorges Syndrome often have near normal levels of immunoglobulins but with significant decreases in T cell numbers and relative increase in the percentage of B cells.



[Q: 1333] OnExamination - Respiratory

A 63 year-old diabetic presents with a pyrexia, productive cough and shortness of breath for 5 days. She has RLL consolidation and a small unilateral pleural effusion on CXR.

Which is a marker of poor prognosis?

- 1- Temp >38°C
- 2- WCC > 15
- 3- Her age
- 4- Her CXR signs
- 5- Her diabetes

Answer & Comments

Answer: 5- Her diabetes

Indicators of poor prognosis in pneumonia include: age >65, co-existing morbidity including diabetes mellitus, chronic renal failure, stroke, coronary artery disease, respiratory rate >30 and mental impairment.

Biochemical/haematological markers include white count < 4 or > 30, hypoxia needing CPAP or FiO₂ > 60%, positive blood culture and blood urea > 7.



[Q: 1334] OnExamination - Respiratory

A 65-year-old woman presented with increasing fatigue, dyspnoea and a dry cough. Her chest X-ray shows an area of dense pneumonia-like consolidation in the right lower lobe. A course of antibiotics did not improve her symptoms or chest X-ray. Bronchioalveolar lavage (BAL) retrieved 'atypical' cells.

What is the most likely diagnosis?

- 1- Bronchioloalveolar cell carcinoma
- 2- Mycoplasma pneumonia
- 3- Pulmonary alveolar proteinosis
- 4- Pulmonary embolism with infarction
- 5- Sarcoidosis

Answer & Comments

Answer: 1- Bronchioloalveolar cell carcinoma

"Bronchoalveolar carcinoma accounts for between 1-20% of pulmonary neoplasms. The population most affected is middle-aged, with no predilection for either sex. Interestingly, there is an increased incidence in patients with scleroderma or other diseases causing localized parenchymal scarring or diffuse interstitial fibrosis. Diffuse bilateral involvement in bronchoalveolar cell carcinoma occurs late in the disease and is usually spread by the bronchial tree. Manifestations include both local and diffuse forms. The local form may grow very slowly changing little for several years. The diffuse form simulates an

airspace filling disease with air bronchograms and air broncholograms. A pleural effusion develops in 8-10% of cases."



[Q: 1335] OnExamination - Respiratory

Which of the following statements is true of the pulmonary function test's vital capacity (VC)?

- 1- Vital capacity cannot be measured from spirometry alone
- 2- Vital capacity is increased in emphysema and reduced in interstitial fibrosis
- 3- Vital capacity is the maximal amount of air which can be exhaled after maximal inspiration
- 4- Vital capacity is the sum of tidal volume (VT) and inspiratory capacity (IC)
- 5- Vital capacity, when reduced, is a specific indication of restrictive lung disease

Answer & Comments

Answer: 3- Vital capacity is the maximal amount of air which can be exhaled after maximal inspiration



[Q: 1336] OnExamination - Respiratory

A 61-year-old, heavy smoker, with a BMI of 37, presents with impotence, nocturia and depression. He is hypoxic at rest on air and has ankle oedema.

Which is the most appropriate investigation to determine the aetiology?

- 1- Arterial blood gas
- 2- Chest x-ray
- 3- Ventilation-perfusion scan
- 4- Thyroid function test
- 5- Sleep study

Answer & Comments

Answer: 5- Sleep study

The clinical scenario describes cor pulmonale secondary to diurnal respiratory failure. This occurs in patients with severe obstructive sleep apnoea (OSA). Most patients who develop this complication have lower airway obstruction (from smoking), gross obesity or respiratory muscle weakness. Hypercapnia out of proportion to the degree of lung disease should suggest OSA as a possibility.



[Q: 1337] OnExamination - Respiratory

Most of the cells that fill the alveoli in desquamative interstitial pneumonitis (DIP) are which of the following?

- 1- Eosinophils
- 2- Lymphocytes
- 3- Macrophages
- 4- Neutrophils
- 5- Plasma cells

Answer & Comments

Answer: 3- Macrophages



[Q: 1338] OnExamination - Respiratory

Which of the following statements concerning industrial lung disorders is correct?

- 1- pneumoconiosis can be diagnosed in the absence of chest X-ray abnormalities
- 2- occupational asthma occurs more frequently in atopic persons
- 3- silo fillers disease is caused by allergy to grain
- 4- widespread crepitations are typically heard in extrinsic allergic alveolitis
- 5- symptoms occur within minutes if exposure to mouldy hay in Farmer's lung

Answer & Comments

Answer: 2- occupational asthma occurs more frequently in atopic persons

a-Pneumoconiosis is an X-Ray diagnosis. It is due to deposition of coal dust in parenchyma and reaction to its presence. The types - simple / complicated - are diagnosed on XRay appearance

b-It also occurs more frequently in smokers.

c-Silo fillers' disease is pulmonary oedema caused by inhalation of oxides of nitrogen generated by fresh silage.

d - examination in EAA usually reveals inspiratory crepitations which tend to be basal rather than widespread, sometimes squeaks, but wheeze is not typical.

e-Symptoms usually occur within hours.



[Q: 1339] OnExamination - Respiratory

A 20-year-old male student is assessed for shortness of breath that occurs whilst running. He has no other symptoms and does not smoke. Examination, full blood count, and chest X-ray are normal.

Which of the following is most likely to be helpful in confirming the suspected diagnosis?

- 1- Arterial blood gas studies before and after exercise
- 2- Determination of lung volumes and diffusing capacity
- 3- Measurement of venous blood lactate before and after exercise
- 4- Spirometry before and after administration of bronchodilators
- 5- Spirometry before and after exercise

Answer & Comments

Answer: 5- Spirometry before and after exercise

The most likely diagnosis is exercise induced asthma and this would be best diagnosed with spirometry before and after exercise where a typical obstructive pattern may be displayed following exercise. No abnormalities may be displayed following bronchodilator therapy if true exercise induced asthma. Similarly lung volumes and diffusion capacity are likely to be unaffected. Blood gas analysis would be relatively unhelpful in this scenario as little change in partial pressures would be expected. This patient does not have a glycogen storage disease where weakness rather than shortness of breath is more typical. Hence lactate measurements are unnecessary.



[Q: 1340] OnExamination - Respiratory

Which one of the following statements is true of chronic obstructive pulmonary disease?

- 1- patients show at least a 15 per cent improvement in the FEV₁ after nebulised bronchodilator
- 2- inhaled corticosteroid usage does not improve long-term prognosis
- 3- breathlessness is uncommon until the FEV₁ falls to approximately 50 per cent of predicted
- 4- emphysema is associated with increased transfer factor
- 5- in advanced cases there is reduced pulmonary vascular resistance

Answer & Comments

Answer: 2- inhaled corticosteroid usage does not improve long-term prognosis

A. This level of improvement would mean the presence of asthma.

B. High dose inhaled steroids have been shown (ISOLDE) to improve quality of life and reduce hospitalisation rates by reducing the number of exacerbations, but it does not slow

the rate of decline of FEV₁ (hence does not affect prognosis).

C. Breathless is common but subjective. Mild COPD (60 - 79% predicted FEV₁) are often unknown to their GP. Those with moderate COPD (40 - 59% predicted) are seen intermittently seen by GP, whilst those with severe disease (< 40% predicted) have frequent hospital and GP visits.

D. It is asthma which is associated with normal or increased transfer factor. COPD is associated with decreased transfer factor.

E. COPD is associated with secondary pulmonary hypertension.



[Q: 1341] OnExamination - Respiratory

A 45-year-old man presents with a three month history of wheezing and dyspnoea whilst at work. His symptoms improve significantly when at home and at weekends.

What is the likely causative agent?

- 1- Asbestos
- 2- Cotton dust
- 3- Isocyanates
- 4- Silica
- 5- Simple coal workers lung

Answer & Comments

Answer: 3- Isocyanates

This patient presents with typical symptoms of occupational asthma and the most likely causative substance is isocyanate which is used in the manufacture of foams/plastics. There are an estimated 1500 to 3000 cases of occupational asthma reported each year. Other implicated substances include Flour dust, wood dust, latex, solder and glues.



[Q: 1342] OnExamination - Respiratory

A patient's arterial blood gas analysis gives the following results:

pO₂ 10 kPa (75mmHg)

pCO₂ 7 kPa (52 mmHg)

pH 7.47

Bicarbonate 37 mmol/L

Which of the following is the most likely cause?

- 1- Chronic hyperventilation Syndrome
- 2- Acute exacerbation of chronic obstructive pulmonary disease
- 3- Pyloric obstruction
- 4- Pulmonary embolism
- 5- Diabetic coma

Answer & Comments

Answer: 3- Pyloric obstruction

These results demonstrate a metabolic alkalosis and there is respiratory compensation with an elevation of pCO₂ in an effort to compensate for the alkalosis. Consequently, pO₂ is slightly low. The most probable cause is pyloric stenosis.



[Q: 1343] OnExamination - Respiratory

The parents of a child with cystic fibrosis consult you wishing to know what is the risk of their next child being a carrier of the condition.

Which ONE of the following percentages is the correct risk?

- 1- 0%
- 2- 25%
- 3- 50%
- 4- 75%
- 5- 100%

Answer & Comments

Answer: 3- 50%

As both parents are carriers for the CF gene then the chances of another child being affected (homozygote) is 1 in 4 (25%). The chances of their child being free from the CF gene is also 1 in 4 (25%) and the chances of a child being a carrier (heterozygote) is 1 in 2 (50%).



[Q: 1344] OnExamination - Respiratory

An otherwise healthy 78-year-old female presents complaining of a 3-day history of tiredness and breathlessness. Her pulse oximetry shows oxygen saturation of 90%. Arterial blood gas analysis performed on air shows

pH 7.3 (7.35-7.45)

pO₂ 7.8 kPa (9-13)

pCO₂ 7.5 kPa (3.5-5.5)

Bicarbonate 30 mmol/l (22-28)

What is the most likely cause?

- 1- Bronchial asthma
- 2- Left ventricular failure
- 3- Lobar pneumonia
- 4- Neuromuscular weakness
- 5- Pulmonary embolism

Answer & Comments

Answer: 4- Neuromuscular weakness

This patient has type 2 respiratory failure as evidence by hypoxia PaO₂ of <8.0kPa and hypercapnia PaCO₂ >6.0kPa. This occurs when alveolar ventilation is insufficient to excrete the amount of CO₂ produced by metabolism. This is due to reduced ventilatory effort, failure to overcome increased resistance to ventilation, failure to compensate for an increase in CO₂ production or a combination of these factors. The commonest cause is

chronic obstructive airway disease, other causes include respiratory muscle weakness eg Guillaine Barre syndrome, chest wall deformity respiratory centre weakness.

The other causes listed here produce type 1 respiratory failure with a mismatch between ventilation and perfusion.



[Q: 1345] OnExamination - Respiratory

A 45-year-old seaman presents with cough and fever. A

CXR demonstrates a cavitating lung lesion.

Which of the following is the most likely cause:

- 1- Histoplasmosis
- 2- Syphilis
- 3- Sarcoidosis
- 4- Amoebiasis
- 5- Brucellosis

Answer & Comments

Answer: 1- Histoplasmosis

Histoplasmosis normally evolves slowly over as long as 20 years but may follow a more rapid course in the immunocompromised (Seamen may be more prone to sexually transmitted diseases such as HIV). Amoebic abscesses can develop in the right lower lobe following transdiaphragmatic spread from amoebic liver abscess (tender hepatomegaly, malaise, spiking temperature). Amoebiasis is also a fresh water pathogen.



[Q: 1346] OnExamination - Respiratory

A 43-year-old asthmatic develops worsening breathlessness and his full blood count has revealed an eosinophilia.

A diagnosis of allergic bronchopulmonary aspergillosis is suspected.

Which of the following statements is true with regard to this diagnosis?

- 1- The immediate skin test to an extract of aspergillus fumigatus is negative
- 2- Circulating IgG precipitins to aspergillus fumigatus are positive
- 3- The CO transfer factor is unaffected
- 4- Recurrent haemoptysis is a characteristic feature
- 5- Pleural effusion is a complication

Answer & Comments

Answer: 2- Circulating IgG precipitins to aspergillus fumigatus are positive

Immediate (type I) reactions occur in virtually all patients with ABPA following intradermal injections of A fumigatus extracts, with only 16% developing delayed (type III) reactions. Precipitating IgG antibodies are present in 70% of patients. Transfer factor may be affected in the later fibrotic stage of the disease. Haemoptysis is symptom of aspergilloma and bronchiectasis, but is not characteristic of ABPA.



[Q: 1347] OnExamination - Respiratory

In the normal lung which of the following is correct?

- 1- There is an intrapleural pressure of 30 cmH₂O (3kPa) at the end of normal expiration.
- 2- There is a resting pulmonary blood flow of 10L/min.
- 3- The V:Q ratio is greater in apical than basal segments of the lung when upright and at rest.
- 4- The majority of airway resistance is generated by small airways.
- 5- Cartilage is present in all respiratory bronchioles.

Answer & Comments

Answer: 3- The V:Q ratio is greater in apical than basal segments of the lung when upright and at rest.

Because of surfactant, the pressure difference across the pleura required to inflate the lungs, is usually no more than about 4cmH₂O. Resting pulmonary blood flow in an adult is around 5L/min. Gas rises, so the V:Q ratio is higher in the apical than the basal segments. While a single small airway provides more resistance than a single large airway, resistance to air flow depends on the number of parallel pathways present. For this reason, the large and particularly the medium-sized airways actually provide greater resistance to flow than do the more numerous small airways. Cartilage disappears in the terminal bronchioles.



[Q: 1348] OnExamination - Respiratory

A 47-year-old woman presenting with breathlessness has arterial blood gases taken which give the following results: pO₂ 8.7 kPa (65mmHg), pCO₂ 4.4 kPa (33mmHg), pH 7.46, { HCO₃⁻ } 24.

Which of the following is the most likely diagnosis?

- 1- Hyperventilation syndrome
- 2- Acute severe asthma
- 3- Emphysema
- 4- Kyphoscoliosis
- 5- Opiate overdose

Answer & Comments

Answer: 2- Acute severe asthma

The patient has an acute respiratory alkalosis with associated hypoxia. This is consistent with an acute asthmatic attack. A normal or rising CO₂ is an ominous sign indicative of a life threatening attack and the need to

consider ventilatory support. Patients with hyperventilation syndrome do show a respiratory alkalosis but this is not associated with hypoxia.



[Q: 1349] OnExamination - Respiratory

Which of the following statements is true of the diffusion capacity of carbon monoxide?

- 1- Is a specific measure of lung perfusion.
- 2- Depends on the thickness of the alveolar wall.
- 3- Is not affected by changes in the surface area available for gas exchange.
- 4- Is increased in cigarette smokers.
- 5- Is increased in emphysema.

Answer & Comments

Answer: 2- Depends on the thickness of the alveolar wall.

By Fick's law, the volume of gas diffusing across a membrane equals $A/T \times D \times$ difference in partial pressure. In life it is impossible to measure accurately the area (A) or the thickness (T), and these are subsumed into a single constant, the diffusion capacity for carbon monoxide. $DL = \text{volume of transferred carbon dioxide} / \text{partial pressure difference between the alveoli and the capillary blood}$. Since the capillary blood normally does not contain carbon dioxide this term disappears. Diffusion will be increased in healthy compared with unhealthy lungs, where the thickness is likely to increase and the surface area available for gas exchange to decrease. V/Q imbalances can indirectly interfere with carbon dioxide diffusion capacity by decreasing the available area of lung for gas exchange, but it is not a specific measure of lung perfusion.



[Q: 1350] OnExamination - Respiratory

What is the most likely cause of upper lobe fibrosis on Chest X-ray?

- 1- Ankylosing spondylitis
- 2- Cryptogenic fibrosing alveolitis
- 3- Rheumatoid arthritis
- 4- Scleroderma
- 5- Systemic lupus erythematosus

Answer & Comments

Answer: 1- Ankylosing spondylitis

Cryptogenic fibrosing alveolitis (which may be associated with connective tissue disorders) affects lower lobes and is associated with clubbing. Extrinsic allergic alveolitis is not associated with clubbing and affects middle/upper zones.



[Q: 1351] OnExamination - Respiratory

A new publication describes a new test for cystic fibrosis. You want to know what proportion of patients with cystic fibrosis who would be correctly identified by this new test.

Which one of the following values would identify this?

- 1- accuracy
- 2- negative predictive value
- 3- positive predictive value
- 4- sensitivity
- 5- specificity

Answer & Comments

Answer: 4- sensitivity

The proportion of patients with the disease who would be identified by the new test is the sensitivity. This refers to the proportion with the disease who truly have cystic fibrosis and are identified as such by the test. Positive

predictive value refers to the percent of people having a positive test who actually have the disease interpreted in conjunction to the prevalence of the disease (True positives/True positives+False positives).



[Q: 1352] OnExamination - Respiratory

A 80-year-old coal miner who stopped working 16 years previously presents with deteriorating dyspnoea.

Investigations show:

FEV₁ 1.4L (predicted 2.5)

FVC 2.8L (predicted 3.0)

What is the most likely diagnosis?

- 1- Chronic obstructive pulmonary disease
- 2- Cryptogenic fibrosing alveolitis
- 3- Extrinsic allergic alveolitis
- 4- Silicosis
- 5- Simple pneumoconiosis

Answer & Comments

Answer: 1- Chronic obstructive pulmonary disease

Both this man's FEV₁ and FVC are reduced. The ratio of FEV₁/FVC is also reduced at 50%. This indicates airways obstruction. Chronic obstructive pulmonary disease (COPD) is the only condition above that results in airways obstruction. Although no smoking history is given this may be expected and his occupation are risk factors for the development of COPD.



[Q: 1353] OnExamination - Respiratory

A 72-year-old lifelong smoker presents with progressive dyspnoea on exertion. He has a chronic, nonproductive cough. On examination he is thin, breathing with pursed lips, respiratory rate 25/min, with mild wheezing on chest auscultation.

Investigations show:

FEV₁ 0.8 L FVC 1.6 L

pH 7.35 paCO₂ 45 mmHg

paO₂ 55 mmHg

What is the predominant mechanism of the airflow limitation in this gentleman?

- 1- Bronchospasm
- 2- Foreign body obstruction
- 3- Increased airways resistance
- 4- Loss of elastic recoil
- 5- Mucus plugging in the small airways

Answer & Comments

Answer: 4- Loss of elastic recoil

This patient has typical features of COAD with a predominant emphysematous element. The pathology is centrilobular or panacinar with loss of elastic tissue.



[Q: 1354] OnExamination - Respiratory

A patient with Rheumatoid arthritis complains of progressive breathlessness.

Which of the following is the most likely cause?

- 1- Pulmonary Eosinophilia
- 2- Asthma
- 3- Pulmonary nodules
- 4- Fibrosing Alveolitis
- 5- Pulmonary Embolus

Answer & Comments

Answer: 4- Fibrosing Alveolitis

Fibrosing alveolitis associated with rheumatoid arthritis is indistinguishable from cryptogenic fibrosing alveolitis. It presents with progressive breathlessness and cough. Signs include finger clubbing, cyanosis and bilateral end inspiratory crackles. Other

pulmonary complications of Rheumatoid arthritis include pleural effusions, empyema, cryptogenic organising pneumonia, bronchiectasis and pulmonary nodules. The latter are usually asymptomatic but may cavitate resulting in haemoptysis and when occurring with coal workers pneumoconiosis (Caplans Syndrome) are associated with breathlessness.



[Q: 1355] OnExamination - Respiratory

A 20-year-old student is found in her bedroom by friends drowsy, confused and sweating. She is unable to give a clear history.

On examination she has a fever of 38.3°C, pulse 110 bpm, BP 110/60 and she appears short of breath with a respiratory rate of 30. Her chest sounded clear to auscultation.

Arterial blood gas result taken on 15 L/min oxygen shows:

pH 7.29 (7.35-7.45)

paO₂ 16 kPa (11-14)

paCO₂ 2.1 kPa (4.5-6)

Which of the following is the most likely diagnosis?

- 1- Aspirin overdose
- 2- Cocaine use
- 3- Legionella pneumonia
- 4- Meningococcal septicaemia
- 5- Severe asthma

Answer & Comments

Answer: 1- Aspirin overdose

There are a number of clues here that point to aspirin toxicity. Fever, sweating, tachypnoea and acidosis. The presence of confusion suggests a severe overdose.

In severe asthma and Legionella pneumonia hypoxia would be expected. Meningococcal septicaemia does not explain the tachypnoea.



[Q: 1356] OnExamination - Respiratory

A 22-year-old lady recently returned from a holiday in Malta was admitted with a 3 day history of fever, generalised lymphadenopathy and a macular rash over the trunk and legs.

Which of the following is the most likely diagnosis.

- 1- Sarcoidosis
- 2- Tuberculosis
- 3- Familial Mediterranean Fever
- 4- Infectious Mononucleosis
- 5- Actinomycosis

Answer & Comments

Answer: 4- Infectious Mononucleosis

Infectious Mononucleosis occurs most commonly in adolescents and young adults. Clinical features occur after a 2-5 week incubation period and include fever, malaise, pharyngitis, and lymphadenopathy. Rashes occur more commonly in patients that have received penicillin or ampicillin.



[Q: 1357] OnExamination - Respiratory

A 35-year-old man presents after 3 months of chronic cough with purulent sputum and shortness of breath on exertion. He gives a history of at least two sinus or bronchial infections per year requiring treatment with antibiotics. He also says he and his wife have been unable to have children. He smokes 15 cigarettes per day. Examination is normal except for some wheezing and an area of focal crackles at the left lung base. Chest X-ray shows patchy infiltrates at both bases.

Investigations revealed

FEV₁ 2.0 L

FVC 2.7 L

pH 7.38

paCO₂ 40 mmHg

paO₂ 82 mmHg

What is the most likely diagnosis?

- 1- alpha-1-Antitrypsin (Antiprotease) deficiency
- 2- Asthma
- 3- Cystic fibrosis
- 4- Hypogammaglobulinemia
- 5- Immotile cilia syndrome

Answer & Comments

Answer: 5- Immotile cilia syndrome

Immotile Cilia Syndrome, also known as Primary Ciliary Dyskinesia and includes Kartegener's Syndrome, is an inherited condition where the cilia lining the airways fail to function or function ineffectively. A defect in the dynein molecule causes the cilia to either totally cease to function or function ineffectively. Kartegener's Syndrome is a subset of patients that account for about half of all people with Immotile Cilia Syndrome. Other associated conditions of Immotile Cilia Syndrome are male infertility, congenital heart defects, deafness, and hydrocephalus. Cystic fibrosis is unlikely to present at this age. Infertility is not typically associated with hypogammaglobulinaemia.



[Q: 1358] OnExamination - Respiratory

A 21-year-old gentleman with cystic fibrosis presents with infertility.

What is the most likely cause for this?

- 1- Chronic prostatic insufficiency
- 2- Failure of development of the vas deferens
- 3- Increasing alkalinisation of semen
- 4- Primary failure of testosterone production
- 5- Production of anti-sperm antibodies

Answer & Comments

Answer: 2- Failure of development of the vas deferens

Infertility occurs in 98% of adult men secondary to maldevelopment of the vas deferens or to other forms of obstructive azoospermia. In women, fertility is decreased secondary to viscid cervical secretions.



[Q: 1359] OnExamination - Respiratory

In a study of a new drug for asthma, a researcher wishes to compare average serum drug concentrations in volunteers, four hours after taking the drug; a. in the fasting state then b. after a meal.

Which of the following would be the most appropriate statistical test to use?

- 1- chi-squared test
- 2- Pearson's correlation coefficient
- 3- Student's paired t-test
- 4- Student's unpaired t-test
- 5- Wilcoxon test

Answer & Comments

Answer: 3- Student's paired t-test

In this scenario we are dealing with use of the drug in the same volunteers with the intervention being the effect of feeding on drug concentrations. Thus you'll be comparing means in the same subjects and the paired t-test would be the most appropriate test.



[Q: 1360] OnExamination - Respiratory

A 60-year-old woman presents with deteriorating dyspnoea and cough productive of a purulent sputum. She has a two year history of recurrent chest infections and is a smoker of 5 cigarettes daily.

On examination, she appeared breathless with a pulse of 100 bpm and a temperature was 39°C.

Investigations revealed:

Haemoglobin 19.5 g/dL (13.0-18.0)??

White cell count $15.7 \times 10^9/L$ (4-11)

Platelet count $350 \times 10^9/L$ (150-400)?

paO₂ 6.8 kPa (11.3-12.6)

Carboxyhaemoglobin 15.5% (3-15)

Red cell mass 147% (75-125)

What is the most likely explanation for these findings?

- 1- Chronic obstructive airways disease
- 2- Ectopic erythropoietin production
- 3- ?Myelofibrosis???
- 4- Primary polycythaemia
- 5- Pseudo-polycythaemia

Answer & Comments

Answer: 1- Chronic obstructive airways disease

This patient has polycythaemia which is likely to be secondary to her hypoxia. The cause of the hypoxia is most likely to be due to chronic obstructive pulmonary disease as a result of his heavy smoking history. His history of increasing breathlessness, cough and sputum production and recurrent chest infections is consistent with this diagnosis. The treatment is for her to stop smoking and long term oxygen therapy (LTOT) (i.e. oxygen > 15 hours /day).

The indications for LTOT are: paO₂ < 7.3 kPa (55 mmHg) or paO₂ < 8.0 kPa (60 mmHg) with evidence of pulmonary hypertension, peripheral oedema or polycythaemia.



[Q: 1361] OnExamination - Respiratory

Which of the following would be the least

likely finding in a patient with sarcoidosis?

- 1- Hepatic granulomas
- 2- Restrictive pulmonary function tests
- 3- Skin lesions
- 4- Uveitis
- 5- X bodies on bronchoalveolar lavage (BAL) fluid

Answer & Comments

Answer: 5- X bodies on bronchoalveolar lavage (BAL) fluid

Sarcoidosis is associated uveitis, arthritis, pulmonary fibrosis, lymphadenopathy and skin changes - lupus pernio/erythema nodosum. It is characterised histologically by the presence of non-caseating granulomas which may occur anywhere. These granulomas have the capacity to produce 1,25 vitamin D explaining the associated hypercalcaemia. Pentamellar X bodies (Birbeck granules) found on BAL are considered diagnostic of Pulmonary Histiocytosis X and so would not be expected with sarcoidosis.



[Q: 1362] OnExamination - Respiratory

Recognised associations.

Which of the following is correct?

- 1- pneumoconiosis and clubbing
- 2- lung carcinoids and pleural effusion
- 3- pulmonary embolus and left bundle branch block
- 4- pulmonary fibrosis and hypercapnia
- 5- bronchopulmonary aspergillosis and wheezing

Answer & Comments

Answer: 5- bronchopulmonary aspergillosis and wheezing

Pulmonary fibrosis associated with type 1 respiratory failure, which is associated with ventilation/perfusion mismatch. Allergic bronchopulmonary aspergillosis caused by *Aspergillus fumigatus*, which can present with asthma and eosinophilia.



[Q: 1363] OnExamination - Respiratory

A 16-year-old girl presents with a 2 day history of deteriorating breathlessness and dyspnoea. Blood gas analysis shows a pH of 7.25, a $p\text{CO}_2$ of 7.0kPa, a $p\text{O}_2$ of 8.5kPa, and a base excess of -4.

Which of the following interpretations is correct?

- 1- Results are consistent with bronchopulmonary dysplasia.
- 2- Blood gases suggest type 1 respiratory failure.
- 3- Immediate intubation is required.
- 4- Results are consistent with late severe asthma.
- 5- Bicarbonate may be necessary to correct the acidosis.

Answer & Comments

Answer: 4- Results are consistent with late severe asthma.

In interpreting blood gas results, the following sequence may be useful:

" Inspect the pH: Is it low, normal or high?

" Inspect the CO_2 : Is it low, normal or high?

" Inspect the PO_2 : Is it low, normal or high?

If the pH is low then an acidosis is present, and inspecting the CO_2 will enable you to determine whether this is due to respiratory or metabolic causes. Inspecting the PO_2 will

tell you whether the patient is hypoxic or not. In this case, the pH is reduced, and the CO_2 is high, with a base deficit of only -4, insufficient to explain the acidosis from metabolic causes. This is, therefore, a respiratory acidosis, and the PO_2 is also low suggesting type 2 respiratory failure. Possible causes would include severe pneumonia, end stage asthma or neurogenic causes such as guillain-Barre. In asthma, the initial stages show a low CO_2 , with this climbing only to accompany failing respiration. The results would therefore be consistent with late severe asthma. In bronchopulmonary dysplasia, there is usually long-term CO_2 retention with compensatory increase in bicarbonate leading to a positive base excess and normal pH. Bicarbonate is usually only considered if the base deficit exceeds about -8.



[Q: 1364] OnExamination - Respiratory

A 20-year-old female with cystic fibrosis presents in early pregnancy wanting advice.

Genetic analysis reveals that her partner is a carrier of the cystic fibrosis gene.

What is the chance of her child having cystic fibrosis?

- 1- 10
- 2- 25
- 3- 50
- 4- 75
- 5- 100

Answer & Comments

Answer: 3- 50

The patient is homozygous for CF (CF/CF) and the father is heterozygous for CF (CF/N). Thus there is a 50% chance that her child will be homozygous for CF and a 50% chance that the child will be a carrier.



[Q: 1365] OnExamination -
Respiratory

Which of the following is a recognised treatment for complications of cystic fibrosis?

- 1- DNAase to assist in reinflating collapsed lung segments.
- 2- Rectal pull-through and anastomosis for rectal prolapse.
- 3- Pancreatic transplant for diabetes mellitus.
- 4- Nebulised tobramycin for pseudomonas colonisation of the lower respiratory tract.
- 5- Hypotonic saline drinks for hypernatraemic dehydration.

Answer & Comments

Answer: 4- Nebulised tobramycin for pseudomonas colonisation of the lower respiratory tract.

Human recombinant DNAase given as a single daily aerosol seems to improve pulmonary function, decrease the frequency of chest exacerbations, and promotes a sense of well-being in patients with mild to moderate disease with purulent secretions. This may be because, in the inflamed airway, the nuclei from dead cells accounts for much of the viscosity of secretions. Rectal prolapse is usually idiopathic, occurring between 1 and 5 years. Intestinal parasites, malnutrition, acute diarrhoea, ulcerative colitis, pertussis, Ehler's Danlos Syndrome, meningocele, cystic fibrosis, and chronic constipation can also predispose to it. Following defecation the prolapse usually resolves spontaneously, or through manual reinsertion by the patient or parent. Nebulised tobramycin or gentamicin may be given when airway pathogens are resistant to oral antibiotics, or where infection is difficult to control at home. Hypernatraemic dehydration should be treated in the usual way.



[Q: 1366] OnExamination -
Respiratory

A 65-year-old man with known chronic obstructive pulmonary disease, treated with inhalers, was admitted with a six-week history of gradually increasing shortness of breath. He was apyrexial, mildly confused with a respiratory rate of 26 breaths per minute and there were no changes on the chest X-ray.

Investigations revealed:

paO₂ 7.8kPa (9-12.6)

paCO₂ 8.5kPa (4.7-6.0)

pH 7.3 (7.36-7.44)

What is the most appropriate immediate management?

- 1- High flow oxygen therapy
- 2- Intravenous aminophylline
- 3- Intravenous hydrocortisone
- 4- Intubation and mechanical ventilation.
- 5- Nebulized salbutamol and ipratropium bromide.

Answer & Comments

Answer: 5- Nebulized salbutamol and ipratropium bromide.

The patient normally uses inhalers and therefore is likely to respond to nebulised bronchodilators, which should be nebulised with air and not high flow oxygen. Corticosteroids have been shown to reduce length of stay in hospital, and are usually given in acute exacerbations of COPD. Non-invasive ventilation should be tried first in severe cases before progressing to mechanical ventilation if appropriate. IV aminophylline is recommended as a second to third line therapy of COPD with reversible airways.



[Q: 1367] OnExamination -
Respiratory

A 60-year-old man with ankylosing spondylitis

presents with cough, weight loss and tiredness. His CXR shows longstanding upper lobe fibrosis. Three sputum tests stain positive for Acid fast bacilli but are consistently negative for Mycobacterium tuberculosis on culture.

Which of the following is the most likely cause?

- 1- Mycobacterium avium intracellulare complex
- 2- Micropolyspora faeni
- 3- Allergic Bronchopulmonary Aspergillosis
- 4- Sarcoidosis
- 5- Tuberculosis

Answer & Comments

Answer: 1- Mycobacterium avium intracellulare complex

The presence of AFB yet absence of TB suggests an atypical AFB such as M. avium.



[Q: 1368] OnExamination - Respiratory

A 56-year-old female presents with a six month history of deteriorating non productive cough and exertional dyspnoea. On examination she is noted to be cyanosed, has clubbing of the fingers and there are bilateral basal crackles. A chest X-ray reveals bilateral basal shadowing and pulmonary investigations show:

paO₂ (on air) 8.5 kPa (11.5-12.5)

FEV₁/FVC ratio 85%

Which one of the following investigations is most likely to establish the diagnosis?

- 1- Bronchoalveolar lavage
- 2- Chest CT scan
- 3- Diffusion Capacity studies
- 4- Echocardiography
- 5- Serum ACE level

Answer & Comments

Answer: 2- Chest CT scan

This patient has restrictive lung disease, most likely Cryptogenic fibrosing alveolitis, the cardinal features being breathlessness and cyanosis, clubbing occurs in two-thirds of cases. She is hypoxic on air, has a restrictive ventilatory defect, and a high resolution CT scan of the chest will show typical changes.



[Q: 1369] OnExamination - Respiratory

A 50-year-old male is taken to the General Practitioner by his long suffering wife. His snoring (which has been steadily increasing in loudness over the past 18 months) is troublesome at home. She says that he makes noises and moves around whilst asleep.

He reports no problems with sleeping. He does admit to gaining 20 kg in weight over the past one year, and to falling asleep during the day.

A sleep study is performed.

Which of the following findings would be most compatible with this man's clinical presentation?

- 1- Fragmented sleep, cessations of airflow measured at the nose accompanied by an increase in oesophageal pressure swings and episodic oxygen desaturation.
- 2- Normal sleep quality, bradycardic episodes, oxygen desaturation but normal airflow.
- 3- Normal sleep quality but cessations of airflow measured at the nose with decreased abdominal wall motion during these flow cessations.
- 4- Progressive oxygen desaturation during the night and alternating periods of hyperventilation and hypoventilation.
- 5- Tachycardia, sleep fragmentation, episodes of hypoventilation with minimal oxygen desaturation.

Answer & Comments

Answer: 1- Fragmented sleep, cessations of airflow measured at the nose accompanied by an increase in oesophageal pressure swings and episodic oxygen desaturation.



[Q: 1370] OnExamination - Respiratory

65-year-old man came to the hospital for worsening breathlessness. He was a chronic smoker and previously diagnosed with lung cancer. Chest X-ray revealed elevation of left hemidiaphragm and left phrenic nerve palsy was suspected.

Which of the following findings on fluoroscopy of diaphragm will confirm the diagnosis?

- 1- No movement of the left hemidiaphragm
- 2- No movement of the right hemidiaphragm
- 3- Normal movement of both hemidiaphragms
- 4- Paradoxical movement of the left hemidiaphragm
- 5- Paradoxical movement of the right hemidiaphragm

Answer & Comments

Answer: 4- Paradoxical movement of the left hemidiaphragm

The diagnosis of phrenic nerve palsy is suspected when, on the chest radiograph, the diaphragmatic leaflet is elevated and is confirmed fluoroscopically by observing paradoxical diaphragmatic motion on sniff and cough. In patients with normal lungs, unilateral paralysis is usually asymptomatic and rarely requires treatment.



[Q: 1371] OnExamination - Respiratory

A 63-year-old woman presents a 5 day history of progressive shortness of breath. Her family brought her in because she was increasingly sleepy during the last 24 hours. She was

diagnosed with Chronic Obstructive Pulmonary Disease 3 years ago and has a FEV₁ less than 50% of predicted. She has an oxygen concentrator at home.

Examination revealed depressed consciousness and a respiratory rate of 24 with shallow breaths. There were decreased breath sounds with minimal air movement.

If an arterial blood gas on room air were to be performed, which of the following results would you expect?

- 1- pH 7.16 paCO₂ 70 paO₂ 50 HCO₃ 24
- 2- pH 7.24 paCO₂ 80 paO₂ 55 HCO₃ 30
- 3- pH 7.32 paCO₂ 60 paO₂ 70 HCO₃ 30
- 4- pH 7.41 paCO₂ 40 paO₂ 50 HCO₃ 24
- 5- pH 7.48 paCO₂ 30 paO₂ 85 HCO₃ 24

Answer & Comments

Answer: 2- pH 7.24 paCO₂ 80 paO₂ 55 HCO₃ 30

This patient's presentation suggests that she has developed acute carbon dioxide retention and would be expected to have a low pH, low pO₂, high pCO₂ and a high HCO₃ because she has long-standing COPD. Consequently the last three options really do not fit. The first option has a pretty much normal bicarbonate and this would be expected to be much higher in chronic COPD (as there would be metabolic alkalosis to compensate for the respiratory acidosis). Therefore this leaves the best fit as option B.



[Q: 1372] OnExamination - Respiratory

A 16-year-old girl presents with shortness of breath and insomnia prior to an examination.

Clinical examination is normal. CXR and PEFr are normal.

Which of the following investigations is most suggestive of asthma?

- 1- diurnal variation in PEFr > 20%

- 2- positive skin prick test to common allergens
- 3- past medical history of hayfever and eczema
- 4- increased total IgE
- 5- resolution of symptoms the day after the exam

Answer & Comments

Answer: 1- diurnal variation in PEFR > 20%

The history of atopy in this patient is consistent with a diagnosis of asthma. IgE being elevated really tells you little other than suggesting atopy and the skin prick would suggest allergy. The resolution of symptoms after the exam suggests anxiety. However, diurnal variation of PEFR >20% is one of the diagnostic criteria for asthma, and we feel this is the most appropriate answer in this case.



[Q: 1373] OnExamination - Respiratory

A 15-year-old boy presented with wheezing when playing football and nocturnal cough.

Which is the best test to confirm the underlying condition?

- 1- A trial of oral corticosteroids
- 2- A trial of inhaled corticosteroids
- 3- A trial of inhaled salbutamol
- 4- Serial peak expiratory flow rate measurements
- 5- Spirometry alone

Answer & Comments

Answer: 4- Serial peak expiratory flow rate measurements

Demonstration of variable obstruction of the airways provides good evidence for asthma, with its characteristic morning dips. Failure to respond to bronchodilator therapy does not exclude asthma as response may be small in children, and in adults with persistent or more

severe asthma. Those who fail to respond to inhaled bronchodilator require a steroid trial (either 4 weeks of high dose inhaled steroids or 2 weeks of oral Prednisolone).



[Q: 1374] OnExamination - Respiratory

A 60-year-old man with breathlessness, fever and headache is suspected of having Farmers Lung. A CXR shows diffuse nodular shadowing predominantly in the mid and lower zones.

What would be the most useful diagnostic test?

- 1- Blood Culture
- 2- Sputum Culture
- 3- Serum precipitating antibodies to Micropolyspora faeni
- 4- Serum Precipitating antibodies to Aspergillus clavatus
- 5- Serum Precipitating antibodies to Cryptostroma corticale

Answer & Comments

Answer: 3- Serum precipitating antibodies to Micropolyspora faeni

The diagnosis of Extrinsic Allergic Alveolitis is based on characteristic clinical, radiological and functional changes and confirmed by demonstration of precipitating antibodies (precipitins) in the patients serum to the causal antigen. In Farmers lung precipitins to M. faeni or Thermoactinomyces vulgaris are found in 75-100% of cases during an acute episode. A. clavatus is the antigen causing Malt Workers lung and C. corticale the antigen causing Maple Bark Strippers Lung.



[Q: 1375] OnExamination - Respiratory

A 55-year-old woman on treatment for long-standing rheumatoid arthritis has recently become dyspnoeic on mild exertion and

developed a dry cough. The oxygen saturation was found to be 87% on air. The chest x-ray showed a diffuse bilateral interstitial infiltrate. An extensive infection screen was negative and her symptoms were felt to be drug-induced.

Which drug is most likely to have caused this adverse effect?

- 1- azathioprine
- 2- cyclosporin
- 3- hydroxychloroquine
- 4- methotrexate
- 5- sulphasalazine

Answer & Comments

Answer: 4- methotrexate

Methotrexate is a well recognised cause of acute pneumonitis and interstitial lung disease. It is a rare complication of methotrexate therapy but is often fulminant and can be fatal.



[Q: 1376] OnExamination - Respiratory

A 52-year-old man enquired about the advisability of vaccination prior to a holiday abroad. He had been treated for asthma with long-term steroids and regularly required doses of Prednisolone in excess of 30mg daily to control acute exacerbations.

Which one of the following vaccinations would be contra-indicated in this man?

- 1- BCG
- 2- Diphtheria toxoid
- 3- H Influenzae B
- 4- Meningococcus
- 5- Tetanus toxoid

Answer & Comments

Answer: 1- BCG

Some individuals, particularly those that are immunosuppressed, are at risk if they are given live vaccines. Inactivated vaccines are generally not dangerous but may be ineffective. They are also at risk of severe manifestations to vaccines such as disseminated infection with BCG. Those patients who receive prednisolone 40mg/day for more than a week or who are on lower doses for more prolonged periods should be considered to be immunosuppressed. Asthma alone is not a contra-indication to vaccination even if patients are taking inhaled corticosteroids.



[Q: 1377] OnExamination - Respiratory

Which of the following statements regarding the sweat test is true?

- 1- Sweating is enhanced by application of atropine.
- 2- The filter paper is left on for a total of about 4 hours.
- 3- At least 25mg of sweat is necessary for a reliable result.
- 4- More than 60mmol/L of chloride in sweat is diagnostic of cystic fibrosis.
- 5- False/positive results may be encountered in children with nephrotic syndrome.

Answer & Comments

Answer: 4- More than 60mmol/L of chloride in sweat is diagnostic of cystic fibrosis.

The sweat test is conducted using pilocarpine iontophoresis. A 3mA current carries pilocarpine into the skin of the forearm stimulating local sweating. The arm is washed with distilled water and sweat collected on a filter paper or gauze. The duration of collection is usually 30-60 minutes. The filter paper is removed, weighed and eluted in distilled water. At least 50mg and preferably 100mg of sweat should be collected for

reliable results. It may not be possible to collect this amount in young infants. More than 60mmol/L of chloride is diagnostic of CF when one or more other criteria are present. In healthy adults, the sweat chloride values increase slightly, but 60mmol/L still differentiates CF from other conditions. False/negative results may be encountered in nephrotic syndromes.



[Q: 1378] OnExamination - Respiratory

A 24-year-old asthmatic female is admitted with acute severe asthma.

Which of the following statements regarding the diagnosis is correct?

- 1- Agitation should be managed with a benzodiazepine
- 2- A high inspired Oxygen concentration should be used routinely
- 3- Inhaled salmeterol is indicated as first line therapy
- 4- Normal arterial pCO₂ is reassuring
- 5- Pulsus paradoxus is a reliable sign of severity

Answer & Comments

Answer: 2- A high inspired Oxygen concentration should be used routinely

A normal or raised arterial pCO₂ is an indication of severe asthma. Pulsus paradoxus is not reliable and is not part of the criteria in assessing severity of asthma attack. Salmeterol is used in management of chronic asthma (Step 3). High dose oxygen (40-60%) should be used in severe asthma attack, together with steroids and nebulised bronchodilators. Sedation must be avoided as it can cause respiratory failure and arrest.



[Q: 1379] OnExamination - Respiratory

A 65-year-old obese man presents with night time sweats, nocturia, poor concentration and day time somnolence.

To which of the following conditions does this diagnosis predispose?

- 1- Hypoglycaemia
- 2- Hypotension
- 3- Insulin sensitivity
- 4- Osteoporosis
- 5- Sudden death

Answer & Comments

Answer: 5- Sudden death

This history is typical of sleep apnoea. Sleep apnoea is an independent risk factor for stroke (and death from all causes), and is associated with hypertension, IGT, and insulin resistance.



[Q: 1380] OnExamination - Respiratory

Which one of the following cells in the lung parenchyma produces surfactant?

- 1- Alveolar macrophage
- 2- Endothelial cell
- 3- Goblet Cell
- 4- Type I pneumocyte
- 5- Type II pneumocyte

Answer & Comments

Answer: 5- Type II pneumocyte

Surfactant is produced by type 2 pneumocytes and is responsible for the ability of the air filled, fluid lined alveoli to expand without collapse.



[Q: 1381] OnExamination -

Respiratory

Obstructive sleep apnoea characteristically associated with:

- 1- hypersomnolence
- 2- impotence
- 3- macrognathia
- 4- insomnia
- 5- polydipsia

Answer & Comments

Answer: 1- hypersomnolence

Dominant symptom = hypersomnolence (sleepiness). Other most common symptoms include apparent personality changes, witnessed apnoeas and true nocturnal polyuria. Reduced libido is less common. Sleep apnoea may be associated with acromegaly, myxoedema, obesity and micrognathia/retrognathia.



[Q: 1382] OnExamination - Respiratory

An 18 year-old female is admitted with a depression of her conscious level. Arterial blood gas analysis revealed:

pH 7.26

pO₂ 12.1 kPa

pCO₂ 3.9 kPa

standard bicarbonate 14.7 mmol/L

Which one of the following would account for these results?

- 1- Analytical error
- 2- Metabolic acidosis
- 3- Persistent vomiting
- 4- Respiratory acidosis
- 5- Respiratory alkalosis

Answer & Comments

Answer: 2- Metabolic acidosis

This patient has a metabolic acidosis with an effort at respiratory compensation as reflected by elevated pO₂ and reduced pCO₂. This could be due to poisoning or a condition such as Diabetic ketoacidosis. Vomiting would cause a metabolic alkalosis.



[Q: 1383] OnExamination - Respiratory

A 55-year-old plumber presented with a dry nocturnal cough and increasing exertional breathlessness.

On examination he had early finger clubbing, cyanosis and bilateral basal crackles. A chest X-ray showed bilateral lower zone shadowing.

Investigations revealed:

paO₂ (breathing air) 8.2 kPa (11.3-12.6)

FEV₁/FVC ratio 85%

Which of the following investigations is most likely to establish the diagnosis?

- 1- Echocardiography.
- 2- High resolution CT scan of chest
- 3- Measurement of diffusion capacity
- 4- Serum angiotensin-converting enzyme (ACE) level
- 5- Transbronchial lung biopsy

Answer & Comments

Answer: 2- High resolution CT scan of chest



[Q: 1384] OnExamination - Respiratory

Which cell type is responsible for the early asthmatic response?

- 1- Basophil
- 2- Eosinophil
- 3- Mast cell
- 4- Neutrophil
- 5- TH1-lymphocyte

Answer & Comments

Answer: 3- Mast cell



[Q: 1385] OnExamination - Respiratory

A 64-year-old man presented with shortness of breath.

On examination he had the signs of a large right-sided pleural effusion.

Investigations revealed:

pleural fluid analysis: protein 48 g/L

What is the most likely cause?

- 1- Cardiac failure
- 2- Constrictive pericarditis
- 3- Hepatic cirrhosis
- 4- Mesothelioma
- 5- Nephrotic syndrome

Answer & Comments

Answer: 4- Mesothelioma

The high protein content of the effusion suggests that it is an exudates. Mesothelioma is the only cause of an exudates in this list. The remaining choices cause a transudative effusion.



[Q: 1386] OnExamination - Respiratory

A 55-year-old man who has a 25 year pack history of smoking presents with productive cough with mucoid sputum of 2 year duration.

On examination he has scattered ronchi and wheezing. The likeliest diagnosis is :

- 1- Bronchial Asthma
- 2- Bronchiectasis
- 3- Chronic Bronchitis
- 4- Pneumonitis
- 5- Fibrosing Alveolitis

Answer & Comments

Answer: 3- Chronic Bronchitis

Chronic bronchitis is one of the most common respiratory diseases due to cigarette smoking. The smoking history and productive cough for at least 2 years is indicative of chronic bronchitis.



[Q: 1387] OnExamination - Respiratory

In a study of a new drug for asthma, a researcher wishes to compare average serum drug concentrations in volunteers, four hours after taking the drug;

* in the fasting state then

* after a meal

Which of the following would be the most appropriate statistical test to use?

- 1- chi-squared test
- 2- Pearson's correlation coefficient
- 3- Student's paired t-test
- 4- Student's unpaired t-test
- 5- Wilcoxon test

Answer & Comments

Answer: 3- Student's paired t-test

In this scenario we are dealing with use of the drug in the same volunteers with the intervention being the effect of feeding on drug concentrations. Thus you'll be comparing means in the same subjects and the paired t-test would be the most appropriate test.



[Q: 1388] OnExamination - Respiratory

A 67-year-old man presents with a long history of cough, breathlessness on minimal exertion and ankle swelling. He smokes 30-40 cigarettes per day.

Investigations are as follows:

Haemoglobin 19g/dl
 white blood count 7.3
 paO_2 (air) 6.2kPa
 paCO_2 (air) 8.9kPa
 serum $[\text{H}^+]$ 44 nmol/l
 serum $[\text{HCO}_3^-]$ 36 mmol/l

What is the most likely explanation of these results?

- 1- acute respiratory acidosis
- 2- chronic respiratory acidosis
- 3- chronic respiratory alkalosis
- 4- metabolic acidosis
- 5- metabolic alkalosis

Answer & Comments

Answer: 2- chronic respiratory acidosis

Normal range $[\text{H}^+]$ = 36-44nM. Normal range $[\text{HCO}_3^-]$ = 21 - 27.5mM. Even if you did not know the normal reference values for H^+ and HCO_3^- , you should have been able to make an intelligent guess at compensated respiratory acidosis from the clinical history, type 2 respiratory failure and probable secondary polycythaemia.



[Q: 1389] OnExamination - Respiratory

You are asked to see a patient who attends A+E with shortness of breath. The chest X-ray shows right lower lobe consolidation.

Which of the following features should prompt admission to hospital?

- 1- Audible Bronchial breathing
- 2- A paO_2 of 9.8 kPa (11-13)
- 3- A SaO_2 of 95%
- 4- A respiratory rate of 32/min
- 5- A White cell count of $16.8 \times 10^9/\text{L}$ (4-10)

Answer & Comments

Answer: 4- A respiratory rate of 32/min

The British Thoracic Society guidelines for community acquired pneumonia in adults recommend use of the CURB-65. A 6-point score, one point for each of Confusion, Urea >7 mmol/l, Respiratory rate 30/min or more, systolic Blood pressure below 90mmHg (or diastolic below 60mmHg), Age 65 years or older. If the CURB score is 1-2 then risk of death is increased and hospital admission should be considered. A CURB score of 3 or more puts the patient at high risk of death and hospital admission is warranted.



[Q: 1390] OnExamination - Respiratory

Randomised controlled trials have shown that long-term oxygen therapy (LTOT) reduces mortality in:

- 1- cryptogenic fibrosing alveolitis
- 2- cor pulmonale due to chronic airflow obstruction
- 3- asthma
- 4- cystic fibrosis
- 5- pulmonary sarcoidosis

Answer & Comments

Answer: 2- cor pulmonale due to chronic airflow obstruction

Adequate data for LTOT prolonging survival exists only for COPD although in practice it is assumed to apply in other chronic hypoxaemic lung conditions.



[Q: 1391] OnExamination - Respiratory

An otherwise healthy 32-year-old man was the driver of a car involved in a high speed RTA 3 days ago. He has sustained a closed fracture of his femur which has been treated surgically with an intramedullary nail, as well as

fractures of his right clavicle and left radius. He was managed according to ATLS protocol when he attended the emergency department. On examination, he is acutely short of breath and has a temperature of 37.5°C. The patient seems confused when you speak to him, and as you examine him, you note petechial haemorrhages.

What do you think is the most likely diagnosis?

- 1- Asthma attack
- 2- Chest infection
- 3- ?Fat embolism???
- 4- Pulmonary embolism
- 5- Tension pneumothorax

Answer & Comments

Answer: 3- ?Fat embolism???

The two diagnosis which should be considered first in this scenario are pulmonary embolism and fat embolism. Although the patient is at high risk of pulmonary embolism, and appropriate measures should be undertaken to reduce this, the clinical scenario is more suggestive of fat embolism. Fat embolism is thought to occur as a result of release of lipid globules from damaged bone marrow fat cells. Another mechanism that has been suggested is the increased mobilisation of fatty acids peripherally.

The effects that are seen clinically depend on what part of the microvasculature is affected by the lipid globules. Pulmonary symptoms are caused by ventilation - perfusion mismatch. Confusion (cerebral effects) may be seen, as well as a petechial rash caused by capillary damage in the skin.



[Q: 1392] OnExamination - Respiratory

A 48-year-old woman presented with shortness of breath, cough with heavy sputum production, and a low grade fever. She has smoked 20 cigarettes per day for 30 years. Her

arterial blood gases revealed pH of 7.4, pCO₂ of 45 mmHg (NR 35-45) and a pO₂ of 78 mmHg (NR 90-110).

What is the most likely diagnosis?

- 1- Bronchial asthma
- 2- Chronic bronchitis
- 3- Cryptogenic fibrosing alveolitis
- 4- Paraneoplastic syndrome
- 5- Pulmonary embolism

Answer & Comments

Answer: 2- Chronic bronchitis

The most likely explanation based on the symptoms and the relative hypoxia with high pCO₂ is an acute exacerbation of COAD - towards the chronic bronchitic end of the spectrum.



[Q: 1393] OnExamination - Respiratory

A 38-year-old male presents with episodic wheeze and non-productive cough which occurs particularly at night. He has been employed in the plastics industry.

Which of the following suggests a diagnosis of occupational lung disease?

- 1- Absent family history of asthma
- 2- Commencement of symptoms on his first day in this employment
- 3- elevated serum IgE concentration
- 4- Improved symptomatology when on holiday
- 5- Increased bronchial reactivity

Answer & Comments

Answer: 4- Improved symptomatology when on holiday

Episodic cough and wheeze with nocturnal symptoms are classical of asthma. Occupational asthma is the commonest

industrial lung disease with over 400 causes and accounts for up to 10% of adult onset asthma. The commonest occupations affected are spray painters, Bakers, Chemical processors, plastics workers and welders and soldering. Patients are characteristically better when on holiday. The diagnosis is confirmed by serial PEF measurements at home and at work. Recordings should be performed 2 hourly for 4 weeks or if this is not possible metacholine/histamine challenges can be undertaken after days at work and away from work. Following objective confirmation of the diagnosis the underlying cause should be identified.



[Q: 1394] OnExamination - Respiratory

An 18-year-old boy is suspected of having cystic fibrosis.

Which of the following results would be most suggestive of this condition?

- 1- Abnormal pancreatic function tests
- 2- Abnormalities in lung function tests
- 3- Bronchiectasis on a chest x-ray
- 4- Elevated sweat chloride concentration
- 5- Low immunoreactive plasma trypsinogen

Answer & Comments

Answer: 4- Elevated sweat chloride concentration

The sweat test is the most important test for CF. Up to 99% of children with CF have sweat chloride and sodium levels above 70 and 60 mM respectively. In normal children, sweat sodium is higher than chloride. The reversed ratio is another pointer to CF. Two sweat tests should be performed spontaneously on both arms with pilocarpine iontophoresis. Older children with CF and pancreatic insufficiency have low immunoreactive trypsin. This and the other tests mentioned may be suggestive of CF but are not diagnostic.



[Q: 1395] OnExamination - Respiratory

Sleep Apnoea syndrome is best diagnosed by the following:

- 1- Polygraphic Sleep Studies
- 2- therapeutic trial of amphetamines
- 3- EEG
- 4- Blood gases during apneic episodes
- 5- Presence of HLA-DR2 and DQw1

Answer & Comments

Answer: 1- Polygraphic Sleep Studies

Sleep apnoea is characterized by cessation of breathing during sleep, which causes extreme restlessness with frequent respiratory pauses and snoring during night sleep, and by daytime drowsiness and irritability. The diagnosis is established by polygraphic recording of sleep which shows periods (at least 30 of 10 or more seconds duration in 7 h of sleep) of apnoea, associated with a fall in arterial oxygen saturation.



[Q: 1396] OnExamination - Respiratory

A 9-year-old boy presents with a history of headache and persistent green nasal discharge. At night he has a cough and snores loudly. The headache is exacerbated by leaning forwards.

On examination he is afebrile, but has a persistent nasal obstruction and nasal speech. He is tender over the maxillae and forehead.

What is the most likely diagnosis?

- 1- Gastroesophageal reflux
- 2- Allergic rhinitis
- 3- Sinusitis
- 4- Asthma
- 5- Croup

Answer & Comments

Answer: 3- Sinusitis

The picture is one of upper airways obstruction associated with nasal discharge, most likely due to sinusitis. In this case the maxillary and frontal sinuses are most likely to be involved.



[Q: 1397] OnExamination - Respiratory

A 65-year-old woman, has smoked 50 cigarettes a day for 40 years. She has had increasing dyspnoea for the several years, but no cough. A Chest X-ray shows increased lung size along with flattening of the diaphragms, consistent with emphysema. Over the next several years she develops worsening peripheral oedema. Her vital signs show T° 36.7 C, P 80, RR 15, and BP 120/80 mm Hg.

Which of the following cardiac findings is most likely to be present?

- 1- Mitral valve stenosis
- 2- Constrictive pericarditis
- 3- Right ventricular hypertrophy
- 4- Left ventricular aneurysm
- 5- Non-bacterial thrombotic endocarditis

Answer & Comments

Answer: 3- Right ventricular hypertrophy

The most likely finding in this woman is pulmonary hypertension as a result of emphysema secondary to long term cigarette smoking. Peripheral oedema is due to right heart dilatation and failure. Mitral stenosis is not supported by the history. Constrictive pericarditis could be caused by a lung malignancy in this patient, but again, there is no suggestion of this in the history. Constrictive pericarditis would be characterised by soft heart sounds, a diastolic "pericardial knock", and gross signs of right heart failure. LV aneurysm would lead to

symptoms and signs of left heart failure and again is not the most likely finding suggested by the history.



[Q: 1398] OnExamination - Respiratory

A 43-year-old Caribbean female Comprehensive school teacher complains of slowly increasing breathlessness. She has no smoking history. Investigations reveal she has bilateral enlarged hilar lymph nodes, elevated serum calcium, interstitial lung disease, and enlarged liver and spleen.

What is the most likely diagnosis?

- 1- Coccidioidomycosis
- 2- Hyperparathyroidism
- 3- Hypervitaminosis D
- 4- Sarcoidosis
- 5- Tuberculosis

Answer & Comments

Answer: 4- Sarcoidosis



[Q: 1399] OnExamination - Respiratory

A 45 year-old male with type 2 diabetes presented to the clinic as his wife complained that he snored excessively.

Which of the following would suggest a diagnosis of obstructive sleep apnoea?

- 1- Daytime sleepiness
- 2- Nasal polyps
- 3- Nocturnal cough
- 4- Poor memory
- 5- Stridor

Answer & Comments

Answer: 1- Daytime sleepiness

The typical problem associated with sleep apnoea syndrome is excessive daytime

somnolence. Associated with obesity, acromegaly, hypothyroidism and Cushing's syndrome. It is felt that the somnolence is due to the interruption of REM sleep by frequent episodes of waking due to apnoeic episodes.



[Q: 1400] OnExamination -
Rheumatology

A 30-year-old woman presents with Raynaud's phenomenon.

Which one of the following clinical features suggests an underlying connective tissue disease?

- 1- History of chilblains
- 2- Involvement of toes
- 3- One previous miscarriage in early pregnancy
- 4- Symmetrical involvement of fingers
- 5- Symptoms developed as a teenager

Answer & Comments

Answer: 1- History of chilblains

A history of chilblains is suggestive of an underlying connective tissue disease.

Other features suggestive of the potential presence or later development of an underlying connective disease include the onset of digital vasospasm after the age of 30, male sex, unilateral involvement, abnormal nailfold capillary changes in microscopy, sclerodactyl, rashes and serological presence of autoantibodies.



[Q: 1401] OnExamination -
Rheumatology

A 50-year-old man presented with a six-week history of general malaise and a 2 day history of a right foot drop, a left ulnar nerve palsy and a widespread purpuric rash. He complained of arthralgia but had no clinical evidence of inflammatory joint disease.

Investigations revealed:

ESR 100 mm/hr

ANCA negative

ANA negative

Rheumatoid factor strongly positive

C3 0.8 g/L (NR 0.75 - 1.6)

C4 0.02 g/L (NR 0.14 - 0.5)

Urine dipstick Blood ++, no protein

An echocardiogram was normal and two sets of blood cultures were negative.

What is the most likely diagnosis?

- 1- ANA negative SLE
- 2- Cryoglobulinaemia
- 3- Infective endocarditis
- 4- Polyarteritis nodosa
- 5- Rheumatoid arthritis

Answer & Comments

Answer: 2- Cryoglobulinaemia

The history is strongly suggestive of systemic vasculitis with mononeuritis multiplex, purpuric rash and haematuria. It is important to exclude conditions which can mimic vasculitis such as infective endocarditis. The normal echocardiogram and negative blood cultures make this unlikely. Whilst polyarteritis nodosa can present with exactly this clinical picture, the marked consumption of C4 together with a strongly positive rheumatoid factor strongly suggests cryoglobulinaemia as the underlying cause. Cryoglobulins are immunoglobulins which precipitate in the cold. They can be type I (monoclonal), type II (mixed monoclonal and polyclonal), or type III (polyclonal). Type I cryoglobulinaemia is associated with haematological diseases such as myeloma and Waldenstrom's. Type II and Type III cryoglobulinaemia can be associated with many connective tissue disorders, chronic infections and most importantly, hepatitis C infection which should always be excluded. Treatment of cryoglobulinaemia would include plasmapheresis, high dose steroids and Cyclophosphamide



[Q: 1402] OnExamination -

Rheumatology

Which of the following statements regarding systemic lupus erythematosus (SLE) is correct?

- 1- when disease is active the levels of complements C3 and C4 are raised.
- 2- when evidence of mild nephritis is present, a renal biopsy is unnecessary.
- 3- there is a female preponderance of 20:1.
- 4- first manifestation of the disease may be idiopathic thrombocytopenia purpura.
- 5- there is neurological involvement in about 10% of cases.

Answer & Comments

Answer: 4- first manifestation of the disease may be idiopathic thrombocytopenia purpura.

When SLE is active the serum complement is depressed. C3 and C4 levels can be used to monitor response to treatment. A poor correlation exists between the clinical manifestations and severity of renal involvement. A biopsy is essential in guiding treatment when renal involvement exists. Neurological involvement is common in SLE. Nearly 50% have neurological problems including: personality disorder, seizures, cardiovascular accidents, and a peripheral neuritis (mononeuritis multiplex).

From Hannam et al. MRCP (Paediatrics) Part 1 MCQs. page 57 © WB Saunders. Reproduced with permission.



[Q: 1403] OnExamination - Rheumatology

A 55-year-old female receiving 10 mg of Methotrexate and 5mg of folate* weekly presents with a sore right finger after cutting herself in the garden. On examination, she has a swollen, erythematous right ring finger up to the proximal interphalangeal joint and you diagnose a cellulitis. You give her a

prescription for erythromycin as she is allergic to penicillins. She has been receiving the Methotrexate for just over one year with no problems and all routine blood monitoring has been normal.

Whilst monitoring the response of the infection to treatment, what is the most appropriate strategy regarding her Methotrexate therapy?

- 1- Continue Methotrexate unchanged and increase folate supplements to 10mg daily.
- 2- Continue Methotrexate and folate unchanged.
- 3- Reduce dose of Methotrexate to 5mg weekly
- 4- Stop Methotrexate until the infection has resolved.
- 5- Stop Methotrexate only if full blood count reveals a neutropaenia.

Answer & Comments

Answer: 4- Stop Methotrexate until the infection has resolved.

In the circumstances of infection, one should consider temporarily stopping methotrexate as it is an immunosuppressant. Any infection should be treated as usual and the response to treatment monitored. Once the infection has been successfully treated methotrexate can be reinstated. However, if the patient has recurrent serious infections while taking methotrexate, its continued long term use should be discussed with the patient's rheumatologist.

*Some local variations may exist regarding dose and frequency of folate therapy. Please be aware of your local guidelines.



[Q: 1404] OnExamination - Rheumatology

A female presents with headache, lethargy and weight loss.

Which of the following would make the diagnosis of giant cell arteritis unlikely?

- 1- A normal ESR
- 2- Bilateral headache
- 3- Non-tender temporal arteries
- 4- Papilloedema on fundoscopy
- 5- The patient is 50 years old

Answer & Comments

Answer: 4- Papilloedema on fundoscopy

Patients are usually elderly with a typical age of 70 but not exclusively so. The temporal arteries are usually tender but they may be non-tender. Similarly there is usually a unilateral headache but often presents as bilateral headache. ESR is typically elevated but a normal ESR is well recognised. However, papilloedema would suggest an alternative diagnosis.



[Q: 1405] OnExamination - Rheumatology

A 33-year-old female presents with pain at the elbow which she has been aware of for the last 2 weeks.

Which of the following would be consistent with a diagnosis of tennis elbow?

- 1- Pain on pressure over the medial epicondyle
- 2- Pain on wrist extension against resistance
- 3- Pain on pronation of the forearm
- 4- Pain on flexion of the fingers against resistance
- 5- Pain on extension of the elbow

Answer & Comments

Answer: 2- Pain on wrist extension against resistance

Tennis elbow is due to lateral epicondylitis and is due to overuse/strain of the extensor

muscles of the forearm. Golfer's elbow is pain at the medial epicondyle. Consequently, there is pain over the lateral epicondyle and the pain is exacerbated by wrist extension.



[Q: 1406] OnExamination - Rheumatology

Which of the following auto-antibodies may have a role in monitoring disease activity?

- 1- Rheumatoid factor in rheumatoid arthritis
- 2- Antinuclear antibodies in systemic lupus erythematosus
- 3- Anti-Sm antibodies in systemic lupus erythematosus
- 4- Anti-ds DNA antibodies in systemic lupus erythematosus
- 5- Anti-Ro (SSA) antibodies in Sjogren's syndrome

Answer & Comments

Answer: 4- Anti-ds DNA antibodies in systemic lupus erythematosus

The serum levels of anti-dsDNA antibodies appears to correlate with disease activity in many patients and often levels will rise just before a flare of disease. The relationship is not close enough to be able to alter treatment based on a rising titre of antibodies but patients should be followed more closely in this situation. Anti-Sm antibodies are very specific for SLE but not sensitive and there is no evidence that levels change with disease activity. The only other autoantibody where there may be some correlation between levels and disease activity is cANCA in Wegener's granulomatosis.



[Q: 1407] OnExamination - Rheumatology

A 65-year-old male is referred due to inadequate pain relief for his hip osteoarthritis.

His GP has prescribed paracetamol and codeine 30mg four times daily but he has found little improvement in his pain relief.

He has a past history of asthma for which he occasionally takes an inhaler.

What is the most likely explanation for the lack of clinical efficacy associated with this medication?

- 1- Fast acetylator status
- 2- Ipratropium accelerates the metabolism of codeine
- 3- Impaired absorption of Codeine
- 4- Inadequate dose of Codeine
- 5- Interaction of Paracetamol with Codeine

Answer & Comments

Answer: 4- Inadequate dose of Codeine

The most likely explanation is that the codeine dose is inadequate.

Studies have shown that paracetamol 1g combined with codeine at dose of 60mg have the best analgesic outcomes.

Ipratropium does not increase the metabolism of codeine.



[Q: 1408] OnExamination - Rheumatology

A 40 year-old woman presents with a year history of Raynaud's phenomenon, dyspepsia and arthralgias. On examination she has sclerodactyly and synovitis of the small joints of the hands. Her ESR is 40 mm/hr (<10) but Rheumatoid factor and Antinuclear Antibody are both negative.

Which one of the following is most likely to develop as a further complication of this disorder?

- 1- anterior uveitis
- 2- butterfly rash
- 3- erosive joint disease

- 4- erythema nodosum
- 5- malabsorption

Answer & Comments

Answer: 5- malabsorption

This woman has features of a mixed connective tissue disorder like CREST/systemic sclerosis with sclerodactyly, Raynaud's, dyspepsia and arthralgia. The absence of ANA found in 90% of systemic sclerosis makes this diagnosis less likely and these antibodies plus Anti-centromere antibodies are also associated with CREST. The most likely development would be a malabsorption which is associated with hypomotility of the small intestine. Erosive arthropathy is rare as is uveitis, with Keratoconjunctivitis sicca being more common.



[Q: 1409] OnExamination - Rheumatology

A 70-year-old retired sea captain develops weakness of the shoulders and hips over a 4 month period. He has also noticed weak finger flexors with normal strength in straightening them. He has had some difficulty swallowing liquids. There is no past medical history, apart from a sexually transmitted disease picked up in the South Pacific some forty years before. This was treated with antibiotics and he is not sure of the diagnosis. He smokes a pipe and drinks 1 or 2 tots of rum at the weekend. A creatinine kinase level comes back at 120.

Which investigation is most likely to give a definite diagnosis?

- 1- Anti Jo 1 antibody titres
- 2- CT scan of the chest
- 3- EMG
- 4- Muscle biopsy with electron microscopy
- 5- 24 hour urine collection for myoglobin

Answer & Comments

Answer: 4- Muscle biopsy with electron microscopy

The diagnosis is inclusion body myositis (IBM). This is an inflammatory condition that affects the over 50s. Proximal muscles and finger flexors are predominantly involved, but distal muscle groups may also be involved. The onset of muscle weakness in IBM is generally gradual (over months or years).

IBM occurs more frequently in men than women. CK may be normal. Jo 1 titres are often raised in dermatomyositis associated with lung disease. EMG shows a similar pattern in polymyositis and IBM - small short duration motor unit arrhythmias can complicate polymyositis and dermayomyositis, but not IBM. There is no association of IBM with malignancy. Polymyositis and Dermatomyositis show a much better response to steroids than IBM. Biopsy in IBM shows intranuclear or cytoplasmic tubofilaments on electron microscopy.



[Q: 1410] OnExamination - Rheumatology

A 24-year-old male has been receiving Sulphasalazine for 6 months as treatment for Reiters disease. His most recent series of blood tests were normal.

When should he next be screened?

- 1- Two weeks
- 2- One month
- 3- Three months
- 4- Six months
- 5- One year

Answer & Comments

Answer: 3- Three months

Guidance suggests that during the first year of treatment with Sulphasalazine, FBC and LFTs should be monitored every 1-2 weeks for the first 3 months then 3 monthly for the first year and then 6 monthly thereafter.

Side effects of Sulphasalazine include Myelosuppression, macrocytosis, hypersensitivity and azoospermia in males.



[Q: 1411] OnExamination - Rheumatology

A 50-year-old female presented with a week's history of pain and stiffness in her shoulders and wrists with symptomatic deterioration in the morning. On examination, there was synovitis of both wrists and there was no proximal muscle wasting or weakness. Her ESR was 50 mm/hr (0 - 20).

What is the most likely diagnosis?

- 1- polymyalgia rheumatica
- 2- polymyositis
- 3- reactive arthritis
- 4- rheumatoid arthritis
- 5- systemic lupus erythematosus

Answer & Comments

Answer: 4- rheumatoid arthritis

In this middle aged female, the acute arthritis of shoulders and wrists together with synovitis and raised ESR are highly suggestive of acute Rheumatoid Arthritis. Weakness and myalgia would be expected with polymyositis and a rash would be expected with SLE with little evidence of a synovitis. There is no prior precipitant to suggest a reactive arthritis and synovitis would be again unusual. PMR would be less likely in this age group and weakness, weight loss without synovitis would be expected.



[Q: 1412] OnExamination -
Rheumatology

A general practice covers a population of 20,000 patients.

How many patients with Rheumatoid Arthritis would be expected in this population?

- 1- 1000
- 2- 500
- 3- 200
- 4- 100
- 5- 50

Answer & Comments

Answer: 3- 200

The prevalence of Rheumatoid Arthritis is approximately 1%. Thus in a practice of 20,000, the number of patients with Rha would be 200, a not insignificant number. Approximately 2-3 females are affected for each male.



[Q: 1413] OnExamination -
Rheumatology

Which of the following has the greatest specificity for Wegener's granulomatosis?

- 1- pANCA and positive antibodies to myeloperoxidase
- 2- atypical ANCA and positive antibodies to myeloperoxidase
- 3- cANCA and positive antibodies to myeloperoxidase
- 4- cANCA and positive antibodies to proteinase 3
- 5- cANCA and positive antibodies to lactoferrin

Answer & Comments

Answer: 4- cANCA and positive antibodies to proteinase 3

When requesting an ANCA test, both immunofluorescence and an ELISA test are generally performed. On immunofluorescence, if ANCA are present, the staining pattern may be cytoplasmic (cANCA) or perinuclear (pANCA). Typical antigen specificity includes proteinase 3 or myeloperoxidase. cANCA and specificity for the PR-3 antigen is most specific for Wegener's granulomatosis. This pattern is also seen in microscopic polyarteritis nodosa and rarely Churg-Strauss syndrome. PANCA and MPO are less specific findings detected in various vasculitic illnesses and occasionally in chronic infections.



[Q: 1414] OnExamination -
Rheumatology

A 40-year-old man presents with acute monoarthritis of the right knee. Gout is confirmed following joint aspiration and examination of the fluid under polarised light microscopy. He underwent endoscopy 3 weeks earlier because of dyspepsia and this confirmed a duodenal ulcer.

Which of the following would be the best initial treatment for him?

- 1- Allopurinol
- 2- Indomethacin alone
- 3- Indomethacin and Lansoprazole
- 4- Indomethacin and Misoprostol
- 5- Intra-articular corticosteroid injection

Answer & Comments

Answer: 5- Intra-articular corticosteroid injection

All non-steroidals including Cox-II selective non-steroidals are contra-indicated in the presence of active ulceration. Allopurinol should never be started in the presence of acute gout as the symptoms will be exacerbated. In a large joint such as the knee, the safest option would be to inject

corticosteroid into the joint. Colchicine would also be an option but is associated with GI toxicity.



[Q: 1415] OnExamination - Rheumatology

A 32-year-old woman is referred from her general practice following a presentation with shortness of breath, myalgia, arthralgia and a skin rash.

Which of the following antibodies when found in this patient is most specific for Systemic Lupus Erythematosus?

- 1- ANA
- 2- Anti-Ro
- 3- Anti-Sm
- 4- cANCA
- 5- Rheumatoid factor

Answer & Comments

Answer: 3- Anti-Sm

The presence of anti-Sm antibodies is more specific for SLE than antinuclear antibodies. Others are not specific for SLE.



[Q: 1416] OnExamination - Rheumatology

A 22-year-old boy with known hereditary angioneurotic oedema (HAO) presents with a recurrent fever, arthralgia and a rash on the face and the upper chest. Despite treatment for his HAO, he has always been troubled by recurrent attacks and has required adrenaline on several occasions. His C4 levels have been persistently reduced secondary to his HAO.

What is the most likely cause for his current symptoms?

- 1- Dermatomyositis
- 2- Drug rash
- 3- Psoriasis with arthropathy
- 4- Systemic Lupus Erythematosus

5- Viral illness

Answer & Comments

Answer: 4- Systemic Lupus Erythematosus

HAO is characterised by deficiency of C1 esterase inhibitor. This leads to persistent activation of the classical complement pathway and C4 levels are frequently low secondary to activation and consumption. If treatment fails to normalise the C4 levels and they remain persistently low, these patients are at an increased risk of developing SLE.



[Q: 1417] OnExamination - Rheumatology

A 65-year-old man complains of bone pain especially in his spine. X-ray revealed lytic lesions in the vertebrae and skull. He also had anemia and hypercalcaemia.

Which of the following is least likely to be present in this patient:

- 1- Bence Jones proteins
- 2- Decreased resistance to infection
- 3- Infiltration of flat bones by plasma cells
- 4- Macroglobulinemia
- 5- Monoclonal gammopathy

Answer & Comments

Answer: 4- Macroglobulinemia

This is multiple myeloma. Macroglobulinemia is not typical of multiple myeloma.



[Q: 1418] OnExamination - Rheumatology

A 68-year-old woman complained of pain at the base of her right thumb. There was tenderness and swelling of the right first carpo-metacarpal joint.

What is the most likely diagnosis?

- 1- avascular necrosis of the scaphoid

- 2- de Quervain's tenosynovitis
- 3- osteoarthritis
- 4- psoriatic arthritis
- 5- rheumatoid arthritis

Answer & Comments

Answer: 3- osteoarthritis

Osteoarthritis of the 1st carpometacarpal joint is extremely common and in a 68-year-old lady is the most likely diagnosis. Swelling is usually bony hard and due to osteophyte formation which can lead to the appearance of squaring of the hand. De Quervain's tenosynovitis is a common overuse condition which present with pain at the base of the thumb but is not associated with joint swelling. This joint can be affected in RA and psoriatic arthritis but rarely on its own.



[Q: 1419] OnExamination - Rheumatology

A 79-year-old woman presents with mild dyspnoea and confusion. Of note in her past medical history was a one year history of Raynaud's phenomenon.

On examination her pulse was 118 beats per minute, she had a blood pressure of 122/88 mmHg and she had a small ulcer on her right big toe.

Auscultation of her chest revealed bibasal crackles and she had mild ankle oedema.

Her investigations show:

haemoglobin 9.5 g/dl (12-16)

white cell count $3.5 \times 10^9/L$ (4-11)

platelet count $110 \times 10^9/L$ (150-400)

serum total protein 120 g/l (60-75)

serum immunoglobulins IgA 0.8 g/l (0.8-3)

IgG 15 g/l (6-13)

IgM 70 g/l (0.4-2.5)

Which of the following complications is she likely to develop?

- 1- Acute renal failure
- 2- Atypical pneumonia
- 3- Erythema repens gyratum
- 4- Hyperviscosity syndrome
- 5- Pathological bone fracture

Answer & Comments

Answer: 4- Hyperviscosity syndrome

This elderly man has a very raised IgM level, pancytopenia, Raynaud's phenomenon and a foot ulcer.

The most likely diagnosis here is Waldenstrom's Macroglobulinaemia (WM). WM refers to a condition that presents in the seventh or eighth decade of life.

It is characterized by the presence of a high level of a macroglobulin (immunoglobulin M [IgM]), elevated serum viscosity and the presence of a lymphoplasmacytic infiltrate in the bone marrow, resulting in pancytopenias.

Raynaud phenomenon may herald the onset of this condition and is due to cryoglobulinemia.

The monoclonal IgM causes hyperviscosity syndrome; cryoglobulinemia types 1 and 2; coagulation abnormalities; polyneuropathies; cold agglutinin disease and anaemia; primary amyloidosis; and tissue deposition of amorphous IgM in skin, the GI tract, kidneys, and other organs.



[Q: 1420] OnExamination - Rheumatology

A 72-year-old lady presents with pain and swelling of the left wrist. Three weeks ago she received an intra-articular steroid injection into the wrist as treatment of chronic pain which was felt to be due to osteoarthritis. On

examination, the joint is erythematous, swollen and tender. Results reveal:

White cell count $12.5 \times 10^9/L$ $4-10 \times 10^9/L$

LDH concentration 400 iu/l 0-250 iu/l

Rheumatoid Factor 34 iu/l <20 iu/l

X-ray of wrist revealed a bony destruction of the joint and wrist aspiration revealed only a dry tap.

What is the most likely diagnosis?

- 1- Acute Gout
- 2- Acute inflammatory reaction related to Osteoarthritis
- 3- Acute rheumatoid arthritis
- 4- Pyrophosphate arthropathy
- 5- Septic arthritis

Answer & Comments

Answer: 5- Septic arthritis

This patient has had an invasive procedure performed relatively recently for suggested OA. Unfortunately the risks associated with intraarticular injection includes joint infection which appears to be the case here. The positive rheumatoid factor is a red herring, is mildly positive here and is found in 2.5% of the population and may be raised in association with Ca, SLE and infection.



[Q: 1421] OnExamination - Rheumatology

A 32-year-old, previously well, female presents with a seven month history of pain and stiffness in her joints. Examination reveals synovitis of the distal interphalangeal joints of the left index finger and the right ring finger together with the left wrist and left ankle joints. The ESR was 35mm in the first hour.

Which one of the following is the most likely diagnosis?

- 1- Osteoarthritis

- 2- Psoriatic arthritis
- 3- Rheumatoid arthritis
- 4- Systemic lupus erythematosus.
- 5- Viral arthritis.

Answer & Comments

Answer: 2- Psoriatic arthritis

The lengthy history with an oligoarticular involvement but affecting the distal interphalangeal joints despite the lack of any previous history of psoriasis is suggestive of psoriatic arthropathy. The synovitis would argue against a diagnosis of OA and the absence of any other supportive features (rash) makes SLE unlikely. One would expect a more symmetrical arthropathy with RhA and it has progressed may beyond the acute period expected for a viral arthritis.



[Q: 1422] OnExamination - Rheumatology

A 32-year-old, previously well, female presents with a seven month history of pain and stiffness in her joints. Examination reveals synovitis of the distal interphalangeal joints of the left index finger and the right ring finger together with the left wrist and left ankle joints. The ESR was 35mm in the first hour.

Which one of the following is the most likely diagnosis?

- 1- Osteoarthritis
- 2- Psoriatic arthritis
- 3- Rheumatoid arthritis
- 4- Systemic lupus erythematosus.
- 5- Viral arthritis.

Answer & Comments

Answer: 2- Psoriatic arthritis

The lengthy history with an oligoarticular involvement but affecting the distal

interphalangeal joints despite the lack of any previous history of psoriasis is suggestive of psoriatic arthropathy. The synovitis would argue against a diagnosis of OA and the absence of any other supportive features (rash) makes SLE unlikely. One would expect a more symmetrical arthropathy with RhA and it has progressed may beyond the acute period expected for a viral arthritis.



[Q: 1423] OnExamination - Rheumatology

A 50-year-old woman presents with dry eyes, a dry mouth, an erythematous rash and polyarthralgia.

Investigations show:

Anti-nuclear antibody strongly positive (1:1600)

Anti-Ro/SSA antibodies strongly positive

Rheumatoid factor positive

IgG 45 g/L (NR <15)

IgM normal

IgA normal

Kappa/lambda ratio normal

What is the most likely diagnosis?

- 1- Hyperviscosity syndrome
- 2- Myeloma associated vasculitis
- 3- Primary Sjogren's Syndrome
- 4- Rheumatoid arthritis with secondary Sjogren's Syndrome
- 5- Systemic Lupus Erythematosus

Answer & Comments

Answer: 3- Primary Sjogren's Syndrome

The clinical features and the serology are typical of primary Sjogren's Syndrome (occurs alone and more likely to have positive anti Ro SSA antibodies than secondary sjogren's). Hypergammaglobulinaemia is present in 80% of individuals. ANA and Anti-Ro/SSA

antibodies are present in approximately 90% of individuals as is a weakly positive rheumatoid factor. The normal kappa/lambda ratio confirms the hypergammaglobulinaemia is polyclonal. Typically secondary sjogren's has pre-existent Rheumatoid or SLE before the development of Sjogren's symptoms.



[Q: 1424] OnExamination - Rheumatology

A 50-year-old woman complains of arthritis and swelling of approximately 4 months duration. On examination, she has a symmetrical inflammation with painful movements of the hands and feet and also swelling of both knees, suggesting a diagnosis of rheumatoid arthritis.

Regarding her joint disease, which of the following suggest an adverse prognosis?

- 1- Acuteness of presentation
- 2- Articular erosions on X-ray
- 3- Elevated C-reactive protein
- 4- Enthesitis
- 5- Sero-negative for Rheumatoid Factor

Answer & Comments

Answer: 2- Articular erosions on X-ray

Articular erosions in rheumatoid arthritis occurring early on in the course of the disease, especially within the first 6 months of presentation, indicate a poor prognosis.

Over time joint damage will relate to disability. A positive rheumatoid factor is associated with more severe erosive disease, extra-articular manifestations including subcutaneous nodules and increased mortality. An acute onset of presentation is not a poor prognostic factor.

Raised inflammatory markers (CRP, ESR) and the duration of the early morning stiffness both correlate with disease activity.



[Q: 1425] OnExamination -
Rheumatology

Which of the following is a pro-inflammatory cytokine?

- 1- C-Reactive Protein
- 2- IL-4
- 3- IL-10
- 4- Serum amyloid precursor protein
- 5- Tumour Necrosis Factor alpha

Answer & Comments

Answer: 5- Tumour Necrosis Factor ?alpha

C-Reactive Protein and Serum Amyloid Precursor protein are acute phase reactants. IL-4 and IL-10 are anti-inflammatory cytokines. TNF-alpha is a pro-inflammatory cytokine. In inflammatory disorders such as rheumatoid arthritis, the levels of TNF-alpha are markedly elevated in inflamed joints. Treatments directed at the inhibition of TNF-alpha such as Infliximab (a monoclonal antibody against TNF-alpha) have been shown to be very effective in the treatment of rheumatoid arthritis and also effective in fistulating Crohn's disease.



[Q: 1426] OnExamination -
Rheumatology

A 25-year-old student presents to casualty with a systemic illness. She appears unwell, with a swinging fever, 3kg weight loss over 2 months, generalised myalgia, polyarthralgia affecting wrists, knees, ankles, elbows and metacarpophalangeal joints, and a sore throat. Investigations demonstrate normochromic normocytic anaemia 9.8g/l, ESR 81 mm in the first hour, CRP 31g/l, serum ferritin 1756mg/dl, RF negative, ANA negative, ENA negative, ASO titre <200iu.

What is the most likely diagnosis?

- 1- Seronegative rheumatoid arthritis
- 2- Adult onset Still's disease

- 3- Systemic lupus erythematosus
- 4- Polymyositis
- 5- Rheumatic fever

Answer & Comments

Answer: 2- Adult onset Still's disease

The clinical scenario fulfils the diagnostic criteria for Adult onset Still's disease (J Rheumatol. 1992 Mar;19(3):424-30). The fever occurs once or twice daily and is described as quotidian or diquotidian returning to 37° or below between episodes. The characteristic evanescent salmon-coloured non-pruritic macular or macular-papular rash occurs in approximately 90% of patients and is often only seen when the patient is febrile and is easily missed. A very high serum ferritin level commonly occurs in AOSD but is not diagnostic, as ferritin levels of this magnitude can also occur in sepsis and in tuberculosis.



[Q: 1427] OnExamination -
Rheumatology

A 30-year-old male presents with a week history of a painful right leg. Past medical history reveals that he had erythema nodosum and recurrent oral and scrotal ulceration. Examination reveals a diffusely swollen left leg.

What is the most likely cause of his swollen leg?

- 1- Cellulitis
- 2- Lymphoedema
- 3- Pyomyositis
- 4- Ruptured popliteal (Baker's) cyst
- 5- Venous thrombosis

Answer & Comments

Answer: 5- Venous thrombosis

This man has clinical features of Behcet's Syndrome. He has had erythema nodosum (EN). 50% of patients with Behcet's have an episode of EN throughout the course of the disease. The condition is a systemic vasculitis typified by recurrent aphthous ulcers, genital ulcers, uveitis and skin lesions. Venous thrombosis is a characteristic manifestation of Behcet's. The most likely cause of this man's swollen leg is therefore venous thrombosis.



[Q: 1428] OnExamination - Rheumatology

A 72-year-old man presents with an acutely painful right knee. On examination, he had a temperature of 37°C with a hot, swollen right knee. Of relevance amongst his investigations, was his white cell count which was $12.6 \times 10^9/L$ and a knee X-ray revealed reduced joint space and calcification of the articular cartilage. Culture of aspirated fluid revealed no growth.

What is the most likely diagnosis?

- 1- gout
- 2- Psoriatic monoarthropathy
- 3- Pseudo-gout
- 4- rheumatoid arthritis
- 5- septic arthritis

Answer & Comments

Answer: 3- Pseudo-gout

This is a typical presentation of pseudo-gout / Calcium pyrophosphate arthropathy with evidence of osteoarthritis, calcification of the articular cartilage and no growth on culture. The differential does include gout but there is nothing else within the history to suggest this as the diagnosis. Distinguishing between the two depends on analysis of the crystals with CPP crystals demonstrating a positive birefringence and urate crystals demonstrating a negative birefringence.



[Q: 1429] OnExamination - Rheumatology

A 45-year-old man has noted pain in his right knee for several years. There is no joint swelling. As he moves about during the day, the pain decreases.

The underlying disease process is probably which of the following?

- 1- Osteoarthritis
- 2- Osteochondroma
- 3- Osteomalacia
- 4- Osteopetrosis
- 5- Osteoporosis

Answer & Comments

Answer: 1- Osteoarthritis

Osteoarthritis usually involves a larger joint. The pain usually diminishes with movement, but recurs with reuse or prolonged use of the affected joint. Osteoporosis would be uncommon in a 45-year-old male. Back pain is a more typical symptom for osteoporosis. Osteochondroma could be located about the knee, but the pain would probably be exacerbated by movement or local trauma. The findings with osteomalacia would be similar to osteoporosis, and back pain would be more typical. Osteopetrosis, an uncommon inherited metabolic disorder, leads to 'brittle bones' that predispose to fractures.



[Q: 1430] OnExamination - Rheumatology

Which of the following statements is true of the immunology of rheumatoid arthritis?

- 1- It is an example of an organ-specific disease.
- 2- Joint damage is the consequence of mast cell degranulation.
- 3- It is likely that joint specific Antigens have been sequestered during the time when

immunological tolerance was being established.

- 4- Rheumatoid factor is detected by a test utilising the patients B lymphocytes.
- 5- Rheumatoid factor is an antibody with reactivity to the heavy chain of IgG.

Answer & Comments

Answer: 5- Rheumatoid factor is an antibody with reactivity to the heavy chain of IgG.

Rheumatoid arthritis is associated with several antibodies such as rheumatoid factor, collagen antibody, capable of reaction at sites other than the joints. Additionally, the disease is not confined to the joints. Damage is mediated by several means, including macrophages activated by CD4+ T cells, and by complement fixing immune complexes. There is no evidence for the creation of joint-specific antibodies in development. All the components of the joint are present during fetal life. The Rheumatoid factor test utilizes the patient's serum, to agglutinate cells coated with antibody. Rheumatoid factor (RF) is an antibody whose specificity is directed to a domain situated within the Fc portion of IgG. The rheumatoid factor may be of IgM, IgG or IgA class. The conventional (agglutination) test, detects only IgM RF.



[Q: 1431] OnExamination - Rheumatology

A 52-year-old female with type 2 diabetes presents with a two month history of painful hands and feet. Investigations confirm a diagnosis of sero-positive erosive rheumatoid arthritis. She has some pain relief from non-steroidal anti-inflammatory agents. She currently takes metformin 500 mg tds and has good glycaemic control as reflected by a HbA1c of 6.7%.

Which of the following DMARDS would be most appropriate initial treatment of her early Rheumatoid Arthritis?

- 1- Ciclosporin
- 2- Etanercept
- 3- Hydroxychloroquine
- 4- IM Gold
- 5- Methotrexate

Answer & Comments

Answer: 5- Methotrexate

Guidance recommends the use of DMARDS early in the treatment of Rheumatoid arthritis maintaining function and reducing progression of the disease (SIGN 2001). First line agents include methotrexate and sulphasalazine (SIGN 2000) and most subjects receive Methotrexate. Generally gold is considered more toxic than the former two and hydroxychloroquine is probably less effective. Ciclosporin is again rather more toxic than either methotrexate or sulphasalazine, with nephrotoxicity and immunosuppression and is generally reserved for RhA with systemic features such as vasculitis.

The TNF alpha antagonists, etanercept and infliximab, are generally reserved for individuals unresponsive to traditional DMARDS*.



[Q: 1432] OnExamination - Rheumatology

A 70-year-old man developed acute monoarthritis of his right ankle on the second postoperative day following an elective inguinal hernia repair. He was on a diuretic for hypertension. On examination his temperature was 38 C.

What is the most likely diagnosis?

- 1- Acute rheumatoid arthritis
- 2- Gout
- 3- Pseudogout
- 4- Septic arthritis

5- Traumatic synovitis

Answer & Comments

Answer: 2- Gout

The most likely diagnosis is gout, given the history of recent surgery and diuretic use.

Pyrophosphate arthropathy is less common, associated with deposition of pyrophosphate chiefly in the knees, second and third metacarpophalangeal joints and there may be a history of haemochromatosis.

Rheumatoid arthritis most commonly manifests as a chronic polyarthritis and synovitis.

Septicaemia following an elective hernia repair would be uncommon as would traumatic synovitis.

Why the fever you may ask? Gout is an inflammatory process and this is what causes the fever.

Fever may even be the most prominent feature of an attack of gout (i.e. it may be a cause of fever of unknown origin - it would suggest an inadequate history and examination of a patient with fever had been taken as well of course!). Recent Prog Med. 1998 Jan;89(1):30-6. Acute gout is a cause of Systemic inflammatory response syndrome (SIRS) (N Z Med J. 1999 Nov 12;112(1099):434-5) which is 2 or more changes of body temperature, heart rate, respiratory function, and peripheral leukocyte count



[Q: 1433] OnExamination - Rheumatology

A 16-year-old girl presents with a 3 month history of polyarthralgia and marked early morning stiffness. Her symptoms respond well to Diclofenac but she is becoming increasingly concerned about her symptoms which appear to be progressing. She is

otherwise well apart from a history of acne which is well controlled on Minocycline. Her mother has severe rheumatoid arthritis.

Investigations:

ESR 50 mm/hr

CRP 100 mg/l

Rheumatoid factor negative

ANA strongly positive (1:1600)

Anti-dsDNA antibodies negative

IgG 25 g/l (normal <15)

What is the most likely cause?

1- Systemic Lupus Erythematosus

2- Drug-induced SLE

3- Fibromyalgia

4- Rheumatoid arthritis

5- Sero-negative spondyloarthropathy

Answer & Comments

Answer: 2- Drug-induced SLE

The history strongly suggests an inflammatory problems and the elevated ESR and CRP confirm this. Rheumatoid arthritis and connective tissue disorders such as SLE would be on the differential diagnosis. The serology is atypical for rheumatoid arthritis and the marked elevation of the CRP would be very unusual for SLE where characteristically, CRP elevation indicates underlying bacterial infection or widespread serositis. The most likely diagnosis is drug-induced SLE. Minocycline has been well documented as a cause of drug-induced SLE. Characteristically, the ESR and CRP are both markedly elevated, the ANA is strongly positive and there is a hypergammaglobulinaemia. Anti-dsDNA antibodies are usually negative. Symptoms usually improve following withdrawal of the drug but can take several months to resolve.



[Q: 1434] OnExamination -
Rheumatology

A 50-year-old man presents with lethargy, polyuria, polydipsia and pain and stiffness of the hands. He has evidence of an arthropathy affecting the 2nd and 3rd metacarpophalangeal joints of both hands with X-ray evidence of degenerative disease at these sites. He also has 5cm hepatomegaly.

Which of the following is the most likely diagnosis.

- 1- Gout
- 2- Osteoarthritis
- 3- Rheumatoid arthritis with amyloidosis
- 4- Pyrophosphate arthropathy
- 5- Haemochromatosis

Answer & Comments

Answer: 5- Haemochromatosis

There are several rheumatic manifestations of haemochromatosis. Classically there is a non-inflammatory degenerative arthropathy affecting the 2nd and 3rd MCP joints with hook-like osteophytes on X-ray. These joints are rarely involved in primary osteoarthritis. Other joints can also become involved especially the hips, knees and shoulders and occasionally the joint disease can resemble rheumatoid arthritis. Other rheumatic manifestations include acute pseudogout (pyrophosphate arthropathy) which presents as an acute monoarthritis, asymptomatic chondrocalcinosis and osteoporosis.



[Q: 1435] OnExamination -
Rheumatology

A 73-year-old male presented with an acute attack of gout in his left knee.

What is the most likely underlying metabolic cause?

- 1- decreased renal excretion of uric acid
- 2- endogenous overproduction of uric acid

- 3- excessive dietary purine intake
- 4- lactic acidosis
- 5- starvation

Answer & Comments

Answer: 1- decreased renal excretion of uric acid

The aetiology of gout can broadly be divided into cases where there is underexcretion of urate via the kidney (90%) or endogenous overproduction of uric acid (10%) although in practical terms the distinction is rarely made as it allopurinol is the mainstay of long-term treatment (not during the acute attack!) in both groups. In a 73-year-old man it is almost certainly reduced renal excretion due to deteriorating renal function and possibly diuretic use. Excessive dietary intake of purines is unlikely to be the main cause in this case.



[Q: 1436] OnExamination -
Rheumatology

A 45-year-old woman notices that she develops tingling and numbness over the palmar surface of her thumb, index, and middle fingers after several hours at her computer workstation doing word processing. Pain in the same area often occurs at night as well.

Which of the following pathologic findings accounts for her symptoms?

- 1- Gout
- 2- Hypertrophic osteoarthropathy
- 3- Localized tenosynovitis
- 4- Rheumatoid arthritis
- 5- Toxic peripheral neuropathy

Answer & Comments

Answer: 3- Localized tenosynovitis

She has carpal tunnel syndrome, an entrapment neuropathy of median nerve. In this lady, tenosynovitis is worsened by repetitive motion i.e. repetitive strain injury.



[Q: 1437] OnExamination - Rheumatology

A 68-year-old woman complained of pain at the base of her right thumb. There was tenderness and swelling of the right first carpo-metacarpal joint.

What is the most likely diagnosis?

- 1- Avascular necrosis of the scaphoid
- 2- De Quervain's tenosynovitis
- 3- Osteoarthritis
- 4- Psoriatic arthritis
- 5- Rheumatoid

Answer & Comments

Answer: 3- Osteoarthritis

Osteoarthritis of the 1st carpometacarpal joint is extremely common and in a 68-year-old lady is the most likely diagnosis. Swelling is usually bony hard and due to osteophyte formation which can lead to the appearance of squaring of the hand. De Quervain's tenosynovitis is a common overuse condition which presents with pain at the base of the thumb but is not associated with joint swelling. This joint can be affected in rheumatoid arthritis and psoriatic arthritis but rarely on its own.



[Q: 1438] OnExamination - Rheumatology

A 23-year-old female presents with a left knee joint pain and a 2 month history of weight loss. She has a good appetite but has had occasional episodes of diarrhoea over this time and tends to pass a loose motion at least twice daily. She is taking no medication but there is a family history of

hypothyroidism. She is a non-smoker and drinks modest quantities of alcohol. Examination reveals a swollen, tender left knee joint with a small effusion.

The most likely diagnosis is?

- 1- Behcet's disease
- 2- Reiter's syndrome
- 3- Inflammatory bowel disease
- 4- Tuberculosis
- 5- Thyrotoxicosis

Answer & Comments

Answer: 3- Inflammatory bowel disease

The description of weight loss, diarrhoea and a mono/oligo-arthritis suggests a diagnosis of inflammatory bowel disease. Reiter's is unlikely to present with oligoarthritis and the diarrhoea is usually acute.



[Q: 1439] OnExamination - Rheumatology

A 23-year-old female presents with a left knee joint pain and a 2 month history of weight loss. She has a good appetite but has had occasional episodes of diarrhoea over this time and tends to pass a loose motion at least twice daily. She is taking no medication but there is a family history of hypothyroidism. She is a non-smoker and drinks modest quantities of alcohol. Examination reveals a swollen, tender left knee joint with a small effusion.

The most likely diagnosis is?

- 1- Behcet's disease
- 2- Reiter's syndrome
- 3- Inflammatory bowel disease
- 4- Tuberculosis
- 5- Thyrotoxicosis

Answer & Comments

Answer: 3- Inflammatory bowel disease

The description of weight loss, diarrhoea and a mono/oligo-arthritis suggests a diagnosis of inflammatory bowel disease. Reiter's is unlikely to present with oligoarthritis and the diarrhoea is usually acute.



[Q: 1440] OnExamination - Rheumatology

A 20-year-old Caucasian lady presents with typical erythema nodosum. She has a low grade fever and bilateral ankle arthritis but no other symptoms and has no medical history. There is no history of travel abroad and she is on no medication.

Which of the following would be the most appropriate investigation for this patient?

- 1- Barium enema
- 2- Chest x-ray
- 3- ESR
- 4- Upper GI endoscopy
- 5- Viral titres

Answer & Comments

Answer: 2- Chest x-ray

Erythema Nodosum is commonly idiopathic. It can also be related to streptococcal infections, acute sarcoidosis or related to drugs such as the oral contraceptive pill, Sulphonamides and Penicillins. Rarer causes include inflammatory bowel disease, TB, Behçet's Disease and other connective tissue disorders. In this case, a chest x-ray would be the most helpful investigation as this may identify bilateral hilar lymphadenopathy which together with a bilateral ankle arthropathy would strongly support a diagnosis of acute sarcoidosis. Investigation of the bowel is unlikely to help in the absence

of any bowel symptoms. Viral titres and ESR are non-specific.



[Q: 1441] OnExamination - Rheumatology

A 42-year-old woman presents with a six month history of dyspepsia. She has a 3 year history of Raynaud's phenomenon.

On examination she had telangiectasia. Her investigations reveal an ESR of 40 mm/hr (0-10) and positive anticentromere antibodies.

Which of the following is a typical late complication of this disorder?

- 1- Alopecia
- 2- Butterfly skin rash
- 3- Erosive polyarthropathy
- 4- Myositis
- 5- Pulmonary hypertension

Answer & Comments

Answer: 5- Pulmonary hypertension

Limited scleroderma is characterised by Raynaud's phenomenon, peripheral skin involvement, skin calcification, telangiectasia, nail fold capillary dilatation and anti-centromere antibodies in 70-80% of patients.

Pulmonary hypertension with or without interstitial lung disease is a characteristic late complication of this disorder.



[Q: 1442] OnExamination - Rheumatology

A 52-year-old woman presented with a two week history of malaise and lower limb joint pain, associated with a vasculitic rash over her shins, thighs and buttocks.

Investigations revealed:

haemoglobin 9.8 g/dL (11.5-16.5)

platelet count $275 \times 10^9/L$ (150-400)

serum creatinine concentration 452 mmol/L (60-110)

antinuclear antibodies Negative

antineutrophil cytoplasmic antibodies Negative

antiglomerular basement membrane antibodies Negative

dipstick urinalysis blood +++

protein +

What is the most likely diagnosis?

- 1- amyloidosis
- 2- haemolytic uraemic syndrome
- 3- Henoch-Schönlein nephritis
- 4- membranous nephropathy
- 5- myeloma

Answer & Comments

Answer: 3- Henoch-Schönlein nephritis

The distribution of the rash together with lower limb joint pains and renal involvement are most suggestive of Henoch-Schönlein purpura. This usually occurs in children aged 2-10 years but can occur in any age group. The only way of differentiating this condition from other small vessel vasculitides is by biopsy the hallmark being IgA deposition in vessel walls on direct immunofluorescence. Membranous nephropathy is a histological diagnosis and usually presents with proteinuria only as does amyloidosis. Myeloma can rarely cause vasculitis which is ANCA negative but this is rare and unlikely. HUS causes haemoglobinuria rather than an active renal sediment.



[Q: 1443] OnExamination - Rheumatology

A 28-year-old woman without any past medical history presents with a 3 month history of arthralgia. She had no past medical history of note.

Examination reveals swelling of the distal interphalangeal joints of the middle and ring fingers of the hand and wrist on the right plus a swollen left ankle.

Investigations show:

ESR 40 mm/hr (0-10)

Which of the following is the most likely diagnosis?

- 1- Acute exacerbation of osteoarthritis
- 2- Psoriatic arthropathy
- 3- Rheumatoid arthritis
- 4- Reactive arthritis
- 5- Systemic lupus erythematosus

Answer & Comments

Answer: 2- Psoriatic arthropathy

This woman has psoriatic arthritis. Synovitis is indicative of an inflammatory arthritis.

Rheumatoid arthritis typically effects the metacarpophalangeal and proximal interphalangeal joints symmetrically. Psoriatic arthritis effects the distal interphalangeal joints and tends to be asymmetrical.

Joint involvement in systemic lupus erythematosus occurs in the form of a polyarticular arthralgia, frequently symmetrical and episodic.

Intense tendonitis is more common than synovitis and can lead to deforming reversible subluxation of joints without erosive disease (Jaccoud's arthropathy).

A short, striking history of marked, acute polyarticular symptoms occurs with systemic (viral) infection.



[Q: 1444] OnExamination - Rheumatology

A 35-year-old female presents with malaise, thirst and increasing nocturia over the last month. Six months ago she attended the

Emergency Department with an episode of renal colic. One month previously her GP had noted an eruptive, painful, erythematous rash on the anterior shins, which was self-limiting.

What is the likely cause of her symptoms?

- 1- Hypercalcaemia
- 2- Hyperglycaemia
- 3- Hypocalcaemia
- 4- Hypokalaemia
- 5- Hyperoxaluria

Answer & Comments

Answer: 1- Hypercalcaemia

This lady appears to have Sarcoid, given the nephrolithiasis secondary to hypercalcaemia and erythema nodosum.



[Q: 1445] OnExamination - Rheumatology

A 25-year-old lady gives birth to a baby with complete heart block who subsequently requires pacemaker insertion.

Which of the following antibodies is most likely to be detected in the maternal serum?

- 1- Anti-dsDNA antibodies
- 2- Anti-endomysial antibodies
- 3- Anti-Ro/SSA antibodies
- 4- Anti-SCL70 antibodies
- 5- Rheumatoid factor

Answer & Comments

Answer: 3- Anti-Ro/SSA antibodies

The majority of cases of congenital heart block are due to the presence of anti-Ro/SSA antibodies in the maternal serum. The mother may have no evidence of a connective tissue disorder. The risks of congenital heart block in mothers with anti-Ro/SSA antibodies remains very small (<3%) but the correlation between the presence of anti-Ro/SSA

antibodies and congenital heart block is very strong. The heart block is generally permanent (unlike other features of neonatal lupus) and insertion of a permanent pacemaker is frequently required.



[Q: 1446] OnExamination - Rheumatology

Bone densitometry performed on a 48-year-old woman demonstrates bone mass decreased more than 2 standard deviations below the mean for her age in her left femoral head, wrist, and lumbar vertebral region.

Six months later, the amount of bone loss is seen to be increased by repeat densitometry examination.

These findings are most likely to be associated with which of the following serum laboratory test abnormalities?

- 1- Intact parathormone of 5 pmol/L (1.2 - 5.8)
- 2- Cortisol of 2060 mmol/L (110 - 607)
- 3- Total serum globulin of 35 g/L
- 4- Uric acid of 930 micromol/L (149 - 446)
- 5- Total cholesterol of 10 mmol/L (< 5.17)

Answer & Comments

Answer: 2- Cortisol of 2060 mmol/L (110 - 607)

She has osteoporosis with decreased bone mass. Most cases do not have a specific etiology, but Cushing's syndrome with hypercortisolism can promote osteoporosis. Her age should make you suspicious. Hypoparathyroidism is not going to accelerate bone loss. The bone resorption that accompanies hyperparathyroidism can cause osteoporosis. Over 95% of cases of osteoporosis are 'primary' with unknown cause. Elevated serum globulin should make you suspect a monoclonal gammopathy, but myeloma leads to focal bone lytic lesions. Hyperuricemia can be associated with gout

that can cause focal bone destruction near affected joints, the bone mass overall is not decreased.



[Q: 1447] OnExamination - Rheumatology

A 52-year-old man who has a long history of chronic alcohol abuse presents with gouty tophi. He is commenced on allopurinol but develops severe joint pains two days later. On examination he has a temperature of 39 C, and erythematous swelling of his hands, knees and ankles.

Investigations reveal:

urate 0.55 mmol/L (0.23-0.46)

c-reactive protein 150 mg/L (< 10)

Which of the following is the most likely cause for his presentation?

- 1- Acute Pyrophosphate arthropathy
- 2- Acute rheumatoid arthritis
- 3- Allopurinol allergy
- 4- Septic arthritis
- 5- Treatment with allopurinol

Answer & Comments

Answer: 5- Treatment with allopurinol

This man is having an acute attack of gout following the initiation of antihyperuricaemic (allopurinol) therapy.

This can be minimised by not starting allopurinol immediately during or shortly after an acute attack of gout, abstaining from alcohol bingeing and gradually increasing the dose of allopurinol.

Alcohol ingestion may also trigger an acute attack of gout, but in this case given the recent commencement of allopurinol, this is more likely to be the trigger.

The most common features of allopurinol hypersensitivity is rash and fever. Joint sepsis

affecting multiple joints is unlikely. Acute pseudogout presents with inflammation of the larger joints, the knees being most commonly affected.



[Q: 1448] OnExamination - Rheumatology

A 28-year-old man presented with acute stiffness and swelling of his knees and ankles, and a painful rash on his legs. The ESR was 86 mm in the first hour. Chest X-ray showed hilar lymphadenopathy.

What is the most likely outcome?

- 1- chronic arthritis
- 2- pulmonary fibrosis
- 3- renal failure
- 4- skin ulceration
- 5- spontaneous improvement

Answer & Comments

Answer: 5- spontaneous improvement

The description is typical of acute sarcoidosis with erythema nodosum, oligoarthropathy and hilar lymphadenopathy. This has a good prognosis and usually resolves spontaneously over 6-8 weeks.



[Q: 1449] OnExamination - Rheumatology

A 78-year-old man presents with an acute onset of severe pain and swelling of the left wrist which had developed since he had a chest infection two weeks previously. On examination, he had a temperature of 38°C and the left wrist was red, swollen and painful.

What is the most appropriate investigation for this patient?

- 1- Erythrocyte sedimentation rate
- 2- Full blood count
- 3- Joint aspiration

4- Serum urate concentration

5- X-ray of the joint

Answer & Comments

Answer: 3- Joint aspiration

The most relevant investigation with anyone with a red, swollen and painful joint would be joint aspiration sending off for cultures and analysis for crystals. Differential diagnoses include gout (where serum urate may fall during acute attack), pseudogout and infection. All diagnoses would be adequately addressed by joint aspiration.



[Q: 1450] OnExamination - Rheumatology

A 75-year-old man has persistent back pain for several months that is unrelated to physical activity. He has lost 12 kg in weight during this time.

Laboratory findings include a White cell count of $6.7 \times 10^9/L$ with a differential of 70 segs, 8 bands, 2 metamyelocytes, 15 lymphocytes, 5 monocytes, and 2 nucleated RBCs/100 WBCs. Haemoglobin is 11.2 g/dL, Haematocrit 33.3%, MCV 88 fL, and platelet count $89 \times 10^9/L$.

The Biochemistry shows a sodium concentration of 144 mmol/L, potassium 4.5 mmol/L, chloride 100 mmol/L, bicarbonate of 26 mmol/L, urea 14 mmol/L, creatinine 90 mmol/L, and a glucose of 5.4 mmol/L.

A CT scan of the spine reveals scattered 0.4 to 1.2 cm bright lesions in the vertebral bodies.

Which of the following additional laboratory test findings is he most likely to have?

- 1- Blood culture positive for *Neisseria gonorrhoeae*
- 2- Parathyroid hormone, intact, of 100 pg/mL (normal < 65)
- 3- Positive serology for *Borrelia burgdorferi*
- 4- Serum calcium of 1.4 mmol/L

5- Serum prostate specific antigen of 35 microgram/L

Answer & Comments

Answer: 5- Serum prostate specific antigen of 35 microgram/L

A prostatic adenocarcinoma should be the first guess (particularly in a male!) with osteoblastic (bone-forming) tumor metastases. Extensive metastases can act as a myelophthitic process that leads to peripheral blood leukoerythroblastosis. His cancer may be causing urinary tract obstruction. Hyperparathyroidism should be accompanied by increased bone lucency. Hypocalcemia is not typically related to bone disease. Lyme disease can be associated with an arthritis, but not bone lesions.



[Q: 1451] OnExamination - Rheumatology

A 73-year-old female presents with difficulty opening jars and bottles. On examination there was tenderness with crepitus and bony swelling over the base of the first metacarpal and wasting of the right thenar eminence. Investigations reveal an ESR of 30 mm/1st hr (0-20), a C-reactive protein of 8mg/L (<10), a Urate concentration of 0.40 mmol/L (0.19-0.36) and her Rheumatoid factor was 60 IU/L (<30). An x-ray of the right hand showed a loss of the joint space with articular sclerosis and osteophytes of the first carpo-metacarpal joint.

What is the most likely diagnosis?

- 1- DeQuervain's tenosynovitis
- 2- Gouty arthritis
- 3- Osteoarthritis
- 4- Pyrophosphate arthritis
- 5- Rheumatoid arthritis

Answer & Comments

Answer: 3- Osteoarthritis

This woman has clinical and radiological features consistent with osteoarthritis (OA) of the 1st right carpometacarpal (CMC) joint. OA is characterised by joint pain, crepitus, stiffness after mobility, and limitation of motion. The CMC joint is involved in gripping and twisting. The clinical joint symptoms are associated with defects in the articular cartilage and underlying bone, outlined in this woman's x-ray findings. Joint swelling is bony in nature, unlike the boggy swelling which occurs in inflammatory arthritis. This woman's ESR is not significantly raised and her CRP is within normal range making an inflammatory arthritis unlikely. A positive rheumatoid factor does not make the diagnosis of rheumatoid arthritis. The frequency of positive rheumatoid factor in normal individuals of age > 70 is upto 10-20%. Thenar wasting occurs in OA of the 1st CMC joint due to disuse.



[Q: 1452] OnExamination - Rheumatology

A 35-year-old female presents with a 6 month history of joint pain and stiffness of hands and feet. Examination reveals a synovitis of the distal interphalangeal joints of the left index finger and the right ring finger together with the right wrist and ankle joints. Her ESR was 35 mm/hr (0-10).

Which one of the following conditions is most likely to exhibit this pattern of joint involvement?

- 1- Osteoarthritis
- 2- Psoriatic arthritis
- 3- Rheumatoid arthritis
- 4- Reactive arthritis
- 5- Systemic lupus erythematosus

Answer & Comments

Answer: 2- Psoriatic arthritis

This woman is most likely to have psoriatic arthritis. Psoriatic arthritis has been subclassified according to different patterns of arthritis: asymmetrical oligoarthritis, symmetric polyarthritis, spondyloarthropathy and arthritis mutilans. In about 20% of patients there is a chronic, progressive, and deforming arthropathy with an asymmetrical pattern, including distal interphalangeal joint involvement. Osteoarthritis in this age group is unlikely. Rheumatoid arthritis is a symmetrical arthritis typically affecting the metacarpophalangeal joints bilaterally. Arthritis does occur in systemic lupus erythematosus, however there are several other clinical features that are form part of the diagnostic criteria. Viral arthritis is self-limiting.



[Q: 1453] OnExamination - Rheumatology

A 35-year old woman who was two months postpartum presented with a four-week history of joint pain, skin rash and fever. The ESR was 40 mm / hour.

What is the most likely diagnosis?

- 1- reactive arthritis
- 2- rheumatoid arthritis
- 3- sarcoidosis
- 4- systemic lupus erythematosus
- 5- Viral arthritis

Answer & Comments

Answer: 4- systemic lupus erythematosus

This is a poor question. The symptoms are non-specific and to answer one needs to know the nature and distribution of the rash and the severity and pattern of the fever. SLE is the most likely to give a combination of joint pains, rash and fever. Documented

persistent or recurrent fevers are not generally a feature of the other conditions. The fact that the patient is 2 months postpartum is irrelevant.



[Q: 1454] OnExamination - Rheumatology

A 70-year-old man complains of pain and stiffness in both his shoulders. He has lost 1 stone in last 8 weeks and complains of feeling lethargic with loss of appetite. Investigations revealed a very high ESR (100 mm/hr), normochromic normocytic anaemia and a positive rheumatoid factor.

The most likely diagnosis is:

- 1- Polyarteritis nodosa
- 2- Polymyalgia Rheumatica
- 3- Polymyositis
- 4- Rheumatoid Arthritis
- 5- SLE

Answer & Comments

Answer: 2- Polymyalgia Rheumatica

This condition is polymyalgia Rheumatica. It is associated with weight loss, anemia and malaise. It is associated with false positive rheumatoid factor especially in the elderly. Positive rheumatoid factor does not make a diagnosis of rheumatoid arthritis.



[Q: 1455] OnExamination - Rheumatology

A 26-year-old male presents with a three month history of arthralgia, mouth ulceration and eye irritation. On examination he was afebrile, had some ulceration of the mouth, bilaterally swollen wrists and effusions with reduced range of movements of both knees.

Examination of the external genitalia revealed a scrotal ulcer. His investigations showed:

white cell count $12 \times 10^9/L$ (4-11)

C-reactive protein 120 mg/dl (<10)

rheumatoid factor negative

What is the most likely diagnosis?

- 1- Behcet's syndrome
- 2- Inflammatory bowel disease
- 3- Psoriatic arthritis
- 4- Reiter's syndrome
- 5- Sjogren's syndrome

Answer & Comments

Answer: 1- Behcet's syndrome

This man has Behcet's on the basis of his orogenital ulceration and oligoarthritis.

Behcet's syndrome is a multisystem disorder characterised by recurrent oral and genital ulceration, eye lesions (anterior or posterior uveitis or retinal vasculitis), skin lesions, (erythema nodosum, papulopustular lesions or folliculitis) and a positive pathergy test.

Other features include musculoskeletal involvement with a mono or oligoarthropathy, venous thromboembolism, neurological and gastrointestinal features.

Reiter's syndrome is a clinical triad of urethritis, conjunctivitis and arthritis after an infective dysentery.

Genital ulceration is not a feature of systemic lupus erythematosus, rheumatoid arthritis or Sjogren's syndrome.



[Q: 1456] OnExamination - Rheumatology

A 62-year-old man has back pain. An FBC shows a WBC count of $3.7 \times 10^9/L$ (4 - 11), hemoglobin 10.3 g/dL (14 - 18), MCV 85 fL, and platelet count $110 \times 10^9/L$ (150 - 400). His total serum protein is 85 g/l with an albumin of 41 g/l. A chest X-ray shows no abnormalities of heart or lung fields, but there are several lucencies in the vertebral bodies. You perform a sternal bone marrow

aspirate and get a dark red jelly-like material in the syringe.

The smear of the aspirate is most likely to show which of the following cell types as a prominent feature?

- 1- Fibroblasts
- 2- Giant cells
- 3- Metastatic renal cell carcinoma cells
- 4- Osteoblasts
- 5- Plasma cells

Answer & Comments

Answer: 5- Plasma cells

The patient has multiple myeloma. The bone marrow needle was in a lytic lesion filled with plasma cells. His serum globulin is high from a monoclonal gammopathy. Osteoblasts are most numerous in repair of bone, and callus is very firm. Fibroblasts produce collagen and are more numerous with the gross appearance of firm, white scar tissue. Giant cells may be seen in a variety of benign and malignant lesions of bone, but this does not explain the hypergammaglobulinemia. Osteolytic metastases of renal cell carcinoma could have the gross appearance described here, but would not account for hypergammaglobulinemia.



[Q: 1457] OnExamination - Rheumatology

An 81-year-old female presents with bilaterally painful knees. There was no history of gastrointestinal diseases. On examination she had crepitus but had a full range of movement of both knees.

Which one of the following is the most appropriate initial treatment for her painful knees?

- 1- Dihydrocodeine
- 2- Naproxen
- 3- Paracetamol

- 4- Celecoxib
- 5- Topical Diclofenac

Answer & Comments

Answer: 3- Paracetamol

This woman has osteoarthritis (OA) of the knees. The principle goal of systemic therapy is to provide the most effective pain relief with the least associated toxicity. Paracetamol is the initial therapy recommended for the treatment of OA of the hip and knee. Studies have shown that the short-term and long-term efficacy of paracetamol is comparable with that of ibuprofen and naproxen in people with knee osteoarthritis. Specific COX-2 inhibitors such as celecoxib have clinical benefit similar to that of traditional NSAIDs, but less GI toxicity although issues remain regarding their cardiovascular risk. They may be used in patients with GI intolerance of traditional NSAIDs.



[Q: 1458] OnExamination - Rheumatology

A previously well, 62-year-old hypertensive builder presents with pain, redness and swelling in the right knee, which started 12 hours ago. There is a family history of hypertension and joint problems.

What investigation is most important in identifying the cause of this patient's knee symptoms?

- 1- ESR
- 2- HLA status
- 3- Joint aspiration for microscopy and culture
- 4- Radiology
- 5- Serology

Answer & Comments

Answer: 3- Joint aspiration for microscopy and culture

This patient has an acute monoarthropathy with pain swelling and erythema of a single joint, this maybe septic arthritis he needs Joint aspiration for microscopy and culture to identify any infective organism so appropriate therapy can be guided. X ray is of no value in septic arthritis it only becomes abnormal following joint destruction.



[Q: 1459] OnExamination - Rheumatology

A 50-year-old Asian lady with severe rheumatoid arthritis has failed on most traditional DMARD treatments. She is currently on Methotrexate 20 mg weekly and for the last 6 months has been receiving regular infusions of the anti-TNF-alpha monoclonal antibody, Infliximab. Her joint disease has dramatically improved. She now presents with fevers, pleuritic chest pain and a large left sided pleural effusion, but little evidence of joint synovitis.

What is the most likely diagnosis?

- 1- Primary bronchial carcinoma
- 2- Pulmonary metastases
- 3- Pulmonary embolus
- 4- Rheumatoid related effusion
- 5- Tuberculosis

Answer & Comments

Answer: 5- Tuberculosis

The most likely answer is TB. All of the other answers are possible and need to be excluded. A rheumatoid effusion is unlikely when peripheral joint disease is so well controlled. Treatment with anti-TNF-alpha increases the risk of opportunistic infections and in particular, there is a significant increase in the risk of TB reactivation in conjunction with Infliximab.



[Q: 1460] OnExamination - Rheumatology

An otherwise healthy middle-aged man with no prior medical history has had increasing back pain and right hip pain for the past 10 years. The pain is worse at the end of the day. He has bony enlargement of the distal interphalangeal joints. A radiograph of the spine reveals the presence of prominent osteophytes involving the vertebral bodies. There is sclerosis with narrowing of the joint space at the right acetabulum seen on a radiograph of the pelvis.

Which of the following pathologic processes is most likely to be taking place in this patient?

- 1- Gout
- 2- Lyme disease
- 3- Osteoarthritis
- 4- Osteomyelitis
- 5- Rheumatoid arthritis

Answer & Comments

Answer: 3- Osteoarthritis

Degenerative osteoarthritis is a common and progressive condition that becomes more frequent and symptomatic with aging. There is erosion and loss of articular cartilage. Rheumatoid arthritis typically involves small joints of the hands and feet most severely, and there is a destructive pannus that leads to marked joint deformity. A gouty arthritis is more likely to be accompanied by swelling, and deformity with joint destruction. The pain is not related to usage. Osteomyelitis represents an ongoing infection that produces marked bone deformity, not just joint narrowing. Lyme disease produces a chronic arthritis, but it is typically preceded by a deer tick bite with a skin lesion. It is much less common than osteoarthritis.



[Q: 1461] OnExamination -
Rheumatology

A man in his 20's begins to note persistent lower back pain and stiffness that diminishes with activity. In his 30's he also develops hip and shoulder arthritis, and in his 40's he is bothered by decreased lumbar spine mobility. He has no other major medical problems.

These findings are most typical for which of the following?

- 1- Ankylosing spondylitis
- 2- Calcium pyrophosphate dihydrate deposition disease
- 3- Lyme disease
- 4- Osteoarthritis
- 5- Rheumatoid arthritis

Answer & Comments

Answer: 1- Ankylosing spondylitis

He probably is also HLA B27 positive. The earlier in life the disease begins, the worse the prognosis. There is a progressive bony ankylosis, especially of spine. RA typically involves small joints. Osteoarthritis typically involves a single large joint. Calcium pyrophosphate dihydrate deposition disease (Pseudogout) is more typical of the elderly and occurs in acute attacks.



[Q: 1462] OnExamination -
Rheumatology

A 70-year-old man from Lancashire has noted increasing back and leg pain for several years. X-rays reveal bony sclerosis of the sacroiliac, lower vertebral, and upper tibial regions with cortical thickening, but without mass effect or significant bony destruction.

He also says his hat does not fit him anymore. He has greater difficulty hearing on the left. He has orthopnea and pedal edema.

Blood tests reveal an elevated serum alkaline phosphatase.

The most likely pathologic process that explains these findings is?

- 1- Decreased bone mass
- 2- Metastatic adenocarcinoma
- 3- Paget's disease of bone
- 4- Renal failure with renal osteodystrophy
- 5- Vitamin D deficiency

Answer & Comments

Answer: 3- Paget's disease of bone

This man has Paget's disease with high output cardiac failure and sensorineural deafness.

Renal osteodystrophy leads to lesions of osteitis fibrosa cystica admixed with osteomalacia, which are focal in nature. Metastatic disease to bone produces focal lesions, not more diffuse enlargement.



[Q: 1463] OnExamination -
Rheumatology

A 75-year-old female presents with hyperosmolar non-ketotic hyperglycaemia. She has a red, hot and swollen knee.

Which of the following is most useful in the diagnosis of the swollen knee joint?

- 1- ANA
- 2- CRP
- 3- Joint Aspiration
- 4- Orthopaedic referral for joint washout
- 5- Rheumatoid factor

Answer & Comments

Answer: 3- Joint Aspiration

Joint aspiration is the best option in this context. It is a simple procedure, with a high diagnostic yield. Sending the joint aspiration for M/C/S in a blood culture bottle may increase yield. The risk of introducing infection into the knee joint during simple

aspiration by non-experts is 1 in 10,000 procedures, so the procedure is safe.



[Q: 1464] OnExamination 2012 -
Nephrology

A 65-year-old with type 2 diabetes mellitus and a heavy smoking history is started on an angiotensin-converting enzyme inhibitor (ACEI) for high blood pressure.

His creatinine subsequently doubles from 100 $\mu\text{mol/l}$ to 200 $\mu\text{mol/l}$. His general practitioner is concerned about the possibility of renal artery stenosis.

Which of the following investigations would give the highest diagnostic yield for this condition?

- 1- CT abdomen
- 2- CT abdomen with contrast
- 3- Duplex ultrasonography
- 4- Magnetic resonance angiogram (MRA)
- 5- Plasma renin levels

Answer & Comments

Answer: 4- Magnetic resonance angiogram (MRA)

Renal artery stenosis is an important cause of hypertension to recognise.

A rise in creatinine of 15% from baseline is expected with commencement of an ACE-inhibitor.

In this vignette, the large rise in creatinine should warrant a search for renal artery stenosis given the likelihood of vascular disease.

Of the investigations listed, CT abdomen and CT abdomen with contrast should not be selected as CT imaging should be directed towards the aorta and not the abdomen (CT angiogram). In addition, the contrast could cause nephrotoxicity in the context of recent acute kidney injury.

Plasma renin levels can be measured but lack specificity.

Duplex ultrasonography is a common first line investigation but may not be diagnostic due to technical difficulties (obese patients, overlying bowel gas).

This leaves MRA as the top choice for investigating renal artery stenosis.



[Q: 1465] OnExamination 2012 -
Nephrology

According to the current classification, which of the following glomerular filtration rate (GFR) ranges in ml/min/1.73m^2 is representative of stage IV chronic kidney disease (CKD)?

- 1- 0 - 10
- 2- < 15
- 3- 15- 29
- 4- 30-59
- 5- 60-80

Answer & Comments

Answer: 3- 15- 29

This question tests knowledge of the classification of chronic kidney disease.

The table below lists stages of CKD and corresponding GFRs.

Options A, B, D and E are not reflective of stage IV chronic kidney disease and are therefore incorrect.

Stage	GFR ml/min/1.73m^2	Description
1	>90	Normal or increased GFR with other evidence of renal damage
2	60-89	Slight decrease in GFR, with other evidence of renal damage
3a	45-59	Moderate decrease in GFR, with or without other

		evidence of renal damage
3b	30-44	As above
4	15-29	Severe decrease in GFR, with or without other evidence of renal damage
5	<15	Established renal failure

The suffix (p) is used to denote the presence of proteinuria when staging CKD. These patients have a worse prognosis, which usually warrants secondary care follow-up.



[Q: 1466] OnExamination 2012 - Nephrology

A 28-year-old gentleman presents to hospital feeling unwell with a few days history of diarrhoea and abdominal pain. He reports having eaten at a 'burger van' a few days ago.

He has no previous hospitalisations. His initial laboratory tests show new onset renal impairment, anaemia and low platelets. His clotting is normal.

Which of the following pathogens is most likely to be responsible for this presentation?

- 1- Clostridium difficile
- 2- Escherichia coli
- 3- Enterococcus faecalis
- 4- Methicillin resistant Staphylococcus aureus (MRSA)
- 5- Streptococcus viridans

Answer & Comments

Answer: 2- Escherichia coli

Haemolytic uraemic syndrome is a syndrome composing of the triad of:

- Microangiopathic haemolytic anaemia
- Low platelets and
- Renal failure.

A number of pathogens are implicated including Escherichia coli, usually the O157:H7 subtype. This produces a verotoxin (also known as Shiga toxin) which binds to endothelial receptors, particularly in the renal, gastrointestinal and central nervous systems thereby causing the clinical symptoms. Thrombin and fibrin are deposited in the microvasculature, and cause haemolysis of circulating erythrocytes. Platelets are also sequestered.

The other pathogens which can cause HUS are Streptococcus pneumoniae, Shigella dysenteriae (type 1 and 3), HIV and Coxsackie virus.

This presentation is not classical of C. difficile as we are given no risk factors for this in the question stem so option A is incorrect.

Enterococcus faecalis is a bowel commensal which is unlikely to cause the degree of pathology described in this case so option C is incorrect.

There is no reason to suspect this gentleman is MRSA positive so option D is incorrect.

Streptococcus viridans is an upper respiratory tract and throat bacteria. This patient's presentation does not involve that organ system so option E is incorrect.



[Q: 1467] OnExamination 2012 - Nephrology

A 33-year-old male who is receiving regular haemodialysis is noted to have a plasma potassium of 6.9 mmol/L (3.5-4.9) before a dialysis session. Usually his potassium is less than 5.5 mmol/L.

Which food combination from the dietary history would be most likely to cause the high potassium concentration?

- 1- Cereal, toast, biscuits.
- 2- Filter coffee, tea, boiled potatoes.
- 3- Milk, butter, plain yoghurt

4- Milk, ham, chicken.

5- Tomato, potato crisps, banana.

Answer & Comments

Answer: 5- Tomato, potato crisps, banana.

In particular tomato and banana have high potassium content and patients should be advised to avoid such foods.



[Q: 1468] OnExamination 2012 - Nephrology

A 77-year-old chronic smoker presented with toe gangrene. He suffered from diabetes mellitus, and had a shrunken right kidney.

The patient had a serum creatinine level of 340 $\mu\text{mol/L}$ before this admission. Neither dorsalis pedis nor posterior tibial pulses were palpable. He was assessed by vascular surgeon, who recommended a magnetic resonance angiography (MRA) with gadolinium (in order to minimise the risk of contrast-induced nephropathy).

What opinion would you formulate?

- 1- Adequate hydration before gadolinium administration should solve the problem.
- 2- Diabetes mellitus is a contraindication for magnetic resonance angiography.
- 3- The magnetic resonance angiography with gadolinium is not recommended because it carries a risk of nephrogenic systemic fibrosis.
- 4- This patient should be administered N-acetylcysteine before receiving gadolinium.
- 5- This patient should be offered imaging with gadolinium because he had a high risk for iodinated radio contrast-induced nephropathy.

Answer & Comments

Answer: 3- The magnetic resonance angiography with gadolinium is not

recommended because it carries a risk of nephrogenic systemic fibrosis.

According to the latest guidelines, the need for a gadolinium-based contrast study should be carefully considered in any patient with chronic kidney disease stage 3 or greater.

Our patient, in other words, had a high risk for this condition of nephrogenic systemic fibrosis (NSF) with potentially fatal consequence. Because of a higher dose requirement of gadolinium in angiography, the odds of NSF are even higher for the patient.

This toxicity of gadolinium cannot be circumvented by hydration (option A) or N-acetylcysteine (option D); they are considered to be more appropriate for preventing radio contrast-induced nephropathy.



[Q: 1469] OnExamination 2012 - Nephrology

The kidney plays a number of important homeostatic and excretory roles. Despite being a small percentage of total body mass, it receives a significant proportion of the cardiac output.

Which of the following answers best estimates the proportion of cardiac output to the kidneys under normal physiological conditions?

- 1- 5%
- 2- 10%
- 3- 20%
- 4- 40%
- 5- 50%

Answer & Comments

Answer: 3- 20%

The kidney requires a significant proportion of the cardiac output to fulfil its functions.

The actual value of cardiac output can vary depending on different physiological states (for example, stress and hypovolaemia) but

approximately 20-25% of the cardiac output goes towards the kidney. Therefore 20% is correct.

The other options are incorrect estimates and should not be selected.



[Q: 1470] OnExamination 2012 - Nephrology

Which of the following lifestyle characteristics is associated with IgA nephropathy?

- 1- Alcohol excess
- 2- Cocaine use
- 3- High cholesterol
- 4- Obesity
- 5- Red meat intake

Answer & Comments

Answer: 1- Alcohol excess

IgA nephropathy is associated with a host of medical conditions.

Heavy alcohol use in the past is also associated with the disease.

There is no known significant association with cocaine use (option B), high cholesterol (option C), obesity (option D) or red meat intake (option E). These answers are therefore incorrect.

Reference:

Donadio JV, Grande JP. IgA nephropathy. *N Engl J Med.* 2002 Sep 5;347(10):738-48



[Q: 1471] OnExamination 2012 - Nephrology

A 66-year-old gentleman with a history of benign prostatic hyperplasia is admitted with a rise in creatinine from 100 μ l to 300 μ l from a routine blood test done in the community.

The admitting team requests an ultrasound of the kidneys which shows normal sized kidneys with no evidence of hydronephrosis.

Of the options below, select the most appropriate size of a normal adult kidney on ultrasound appearance (measured longitudinally).

- 1- 6 cm
- 2- 11 cm
- 3- 15 cm
- 4- 18 cm
- 5- 20 cm

Answer & Comments

Answer: 2- 11 cm

The normal adult kidney size on ultrasound is between 9-12 cm hence option B is correct.

Ultrasonography plays a crucial part in evaluating acute and chronic renal impairment. In this case of suspected prostatic obstruction it is important to exclude hydronephrosis.

In the adult population the usual range of kidney size measured longitudinally is between 9 cm-12 cm (hence option B is correct).

The other options, A, C, D and E fall out of this range and should not be selected.

Reference:

SA Emamian, MB Nielsen, JF Pedersen, and L Ytte *Kidney dimensions at sonography: correlation with age, sex, and habitus in 665 adult volunteers. Am. J. Roentgenol., Jan 1993; 160: 83 - 86.*



[Q: 1472] OnExamination 2012 - Nephrology

A 16-year-old female presents with a three year history of recurrent colicky loin pain. One year ago she passed a renal calculus.

Twenty four hour urine collection showed normal levels of calcium, phosphate and urate, but elevated levels of arginine, cystine, lysine and ornithine.

Which one of the following features is characteristic of this condition?

- 1- Accumulation of cystine in collecting system
- 2- Autosomal dominant inheritance
- 3- Cystine deposits within the cornea
- 4- Functional defects within the glomeruli
- 5- Radiolucent renal stone formation

Answer & Comments

Answer: 1- Accumulation of cystine in collecting system

This condition is typical of cystinuria/nephropathic cystinosis, an autosomal recessive genetic defect in membrane transport for cystine, lysine, ornithine and arginine in epithelial cells.

The disease is characterised by recurrent nephrolithiasis.

Radiolucent stones are not specific for this condition and may be seen with uric acid stones.



[Q: 1473] OnExamination 2012 - Nephrology

If a patient with chronic renal failure is treated with erythropoietin (EPO), *which of the following will be expected in this patient?*

- 1- Decreased pure red cell aplasia
- 2- Decreased risk of hypertension
- 3- Decreased risk of thrombosis
- 4- Increased well being
- 5- Reduced appetite

Answer & Comments

Answer: 4- Increased well being

Increased viscosity is seen in EPO therapy which may exacerbate hypertension and there is also increased risk of thrombosis.

Pure red cell aplasia is a rare unwanted effect due to stimulation of antibodies by administered EPO which cross reacts with the patient's endogenous EPO.

Improvement in haemoglobin level results in the increased well being and better appetite.



[Q: 1474] OnExamination 2012 - Nephrology

A 16-year-old girl presented with Henoch-Schönlein purpura and renal involvement.

What is the most likely outcome?

- 1- A high probability of relapse
- 2- Complete renal recovery
- 3- Persistent hypertension
- 4- Persistent proteinuria
- 5- Requirement for long term corticosteroids

Answer & Comments

Answer: 2- Complete renal recovery

Henoch-Schönlein purpura (HSP) is a self-limiting vasculitis which occurs in children and young adults.

It is characterised by non-thrombocytopenic purpura, arthralgia, abdominal pain and glomerular nephritis.

It is likely to be an immune complex disease involving immunoglobulin (Ig)A, but no treatment has proven efficacy.

The disease usually settles between four to six weeks without sequelae if kidney involvement is mild. However this condition can occasionally relapse.



[Q: 1475] OnExamination 2012 -
Nephrology

A 62-year-old man with a longstanding history of hypertension is seen in the outpatient clinic.

Investigations show:

Creatinine 280 $\mu\text{mol/L}$ (60-110)

Urinalysis: Blood ++

Protein 1.8 g/L

Ultrasound scan of kidneys: left kidney 8.5 cm; right kidney 8.9 cm.

What is the best investigation to diagnose the cause of his renal impairment?

- 1- Intravenous urogram (IVU)
- 2- Isotope renogram
- 3- Renal angiogram
- 4- Renal biopsy
- 5- Retrograde pyelogram

Answer & Comments

Answer: 4- Renal biopsy

This patient has a long history of hypertension, therefore it should have been appropriately controlled in the clinic.

The patient now presents with bilaterally shrunken kidneys, renal impairment and evidence of a glomerulonephritis.

In the presence of mild to moderate hypertension, proteinuria indicates either underlying renal disease or renovascular disease.

As this patient has blood and protein in the urine, on the background of impaired renal function and shrunken kidneys, the best investigation would be to perform a renal biopsy (assuming the hypertension was controlled). This would differentiate between renovascular disease and glomerulonephritis, which may be reversible.

If this patient had the above clinical findings without blood and protein in the urine, then the investigation of choice would be a renal angiogram, to diagnose renovascular disease.



[Q: 1476] OnExamination 2012 -
Nephrology

A 70-year-old female presents for investigation of fatigue and weight loss.

Investigations reveal:

Haemoglobin 9.0 g/dL (11.5-16.5)

White cell count $2.0 \times 10^9/\text{L}$ ($4-11 \times 10^9$)

Platelet count $250 \times 10^9/\text{L}$ ($150-400 \times 10^9$)

Total protein 74 g/L (61-76)

Albumin 28 g/L (37-49)

Urea 16 mmol/L (2.5-7.5)

Creatinine 250 $\mu\text{mol/L}$ (60-110)

Plasma glucose 6.5 mmol/L (3.0-6.0)

Urine dipstick analysis Protein + & blood +

Renal ultrasound Normal

Which one of the following investigations would be most appropriate for this patient?

- 1- 24 hour urinary protein estimation
- 2- Measurement of anti-glomerular basement membrane (anti-GBM) antibodies
- 3- Measurement of anti-neutrophil cytoplasmic antibodies (ANCA)
- 4- Plasma protein electrophoresis
- 5- Renal angiography

Answer & Comments

Answer: 4- Plasma protein electrophoresis

This patient may well have myeloma as reflected by the anaemia, leucopenia and elevated non-albumin protein concentration.

Thus plasma protein electrophoresis would be the investigation of choice in this patient.



[Q: 1477] OnExamination 2012 - Nephrology

A 65-year-old man is admitted with renal failure and is diagnosed with acute tubular necrosis (ATN).

Which of the following is least likely to be the cause of acute tubular necrosis?

- 1- Corticosteroid therapy
- 2- Hypertension
- 3- Hypovolaemia
- 4- Paracetamol poisoning
- 5- Rhabdomyolysis

Answer & Comments

Answer: 1- Corticosteroid therapy

Renal failure from ATN occurs in 25% of patients with severe hepatic damage.

Accelerated hypertension can cause small vessel obstruction with proliferative endarteritis of intralobular arteries and fibrinoid necrosis of afferent arterioles and glomerular capillary tuft.

Corticosteroid therapy has not been associated with ATN.

Other causes of ATN include:

- Hypotension
- Hepatic failure
- Eclampsia
- Drugs such as aminoglycosides, cephalosporins, cisplatin, amphotericin.



[Q: 1478] OnExamination 2012 - Nephrology

Which of the following concerning the pH of urine is correct?

- 1- Is a useful indicator of the acid/base balance of the blood
- 2- Rises on a vegetarian diet

- 3- Is determined by the concentration of ammonium
- 4- Is lower than 5.5 in renal tubular acidosis (RTA)
- 5- Would be above 7.0 after prolonged and severe vomiting

Answer & Comments

Answer: 2- Rises on a vegetarian diet

Urine pH is affected by diet, with vegetarians having more alkaline urine when compared with omnivores.

Animal proteins contained in meat, eggs and cheese are often converted into acidic products (for example, amino acids) during digestion, absorption or metabolism. This provides a daily increase in the body's acid content, which has to be excreted by the kidneys. For people eating a vegetarian diet, consumption of foods rich in citrate or carbonated drinks raise the urine pH.

Other situations can interfere with this balance, such as tubular function or bacterial infection, which often promotes an alkaline urine pH due to the presence of bacterial enzymes converting urea to ammonia.

Urine pH has variable effects upon stone formation. The solubility of uric acid is markedly decreased in an acidic solution so uric acid stones are more likely to form. However, calcium phosphate becomes less soluble at pH>6; hence calcium phosphate stones are more likely to form in an alkaline urine. Therefore dietary advice needs to be tailored to the clinical scenario.

C. Excretion of ammonium occurs when an acid urine is produced but the pH of urine is of course determined by the concentration of H⁺ ions.

D. Unable to lower the pH to less than 5.5 in type 1 RTA.

E. This would be expected in an attempt to compensate for the loss of acid; however when there is extracellular fluid depletion the retention of sodium takes priority.

Instead of bicarbonate being excreted it is reabsorbed in the proximal and distal nephron and this perpetuates the metabolic alkalosis until the fluid balance is restored with intravenous (IV) fluids.

Reference:

Grases F, Costa-Bauza A, Prieto RM. Renal lithiasis and nutrition. *Nutr J* 2006; 5:23. (free access through pubmed).



[Q: 1479] OnExamination 2012 - Nephrology

A 55-year-old homeless male was found stuporous and smelling of alcohol.

Observations in the emergency department reveal a core temperature of 34°C, a pulse of 50 bpm and blood pressure of 116/80 mmHg. Dipstick urine analysis shows blood +++.

Some of his investigations are listed:

Creatinine 320 µmol/l (60-110)

Gamma GT 40 U/l (10-40)

AST 550 U/l (1-40)

LDH 1500 U/l (10-250)

Urine microscopy no cells or organisms.

What is the most likely cause of the raised serum creatinine concentration?

- 1- Chronic renal failure
- 2- Dehydration
- 3- Hypothermia
- 4- Paracetamol poisoning
- 5- Rhabdomyolysis

Answer & Comments

Answer: 5- Rhabdomyolysis

The elevated serum creatinine is most likely due to rhabdomyolysis as the patient was

found unconscious, is hypothermic, and is likely to have sustained muscle injury.

The latter is confirmed by an elevated aspartate aminotransferase and lactate dehydrogenase (LDH) but the normal gamma-glutamyl transpeptidase (GGT) argues against these being released from the liver.

Rhabdomyolysis is strongly suggested by the fact that urinalysis is strongly positive for blood, whereas urine microscopy is negative for red blood cells.

The positive urinalysis is caused by myoglobin, a muscle protein released during muscle damage; this appears in the urine and can cause acute renal failure.



[Q: 1480] OnExamination 2012 - Nephrology

A 49-year-old smoker who had been diagnosed with diabetes mellitus two years ago was hospitalised because of a foot ulcer. Below knee amputation was performed because of necrotising fasciitis.

Pre-operatively, his serum creatinine measured 78 micromol/L. After recovery from the operation, a repeat creatinine showed a level of 54 micromol/L.

What is the most likely explanation for the decrease in serum creatinine level?

- 1- This is compatible with daily variation of creatinine level.
- 2- The kidney function did not improve but creatinine generation reduced after amputation.
- 3- The nephrologist started dialysis.
- 4- The kidney improved with resolved inflammation.
- 5- None of the above.

Answer & Comments

Answer: 2- The kidney function did not improve but creatinine generation reduced after amputation.

The use of serum creatinine to estimate the glomerular filtration rate can be misleading when the patient has abnormal muscle mass (such as leg amputation).

We assume an improvement of kidney function when there is a falling creatinine level; this statement holds true only in the absence of a large change in muscle mass (or meat intake).

The generation of creatinine is primarily determined by dietary intake and muscle mass, which probably accounts for the apparent 'improvement' in the creatinine level after an amputation (option D).

The option C should not be chosen because our question mentioned no clear indication for dialysis.



[Q: 1481] OnExamination 2012 - Nephrology

A 65-year-old woman with a history of recurrent urinary tract infections attends the Emergency department with loin pain and haematuria.

She is diagnosed with renal stones the composition of which is magnesium ammonium phosphate.

Which of the following organisms are likely to be implicated in her urinary infections?

- 1- Bacteroides fragilis
- 2- Enterococcus faecalis
- 3- Escherichia coli
- 4- Proteus mirabilis
- 5- Staphylococcus aureus

Answer & Comments

Answer: 4- Proteus mirabilis

Bacteroides fragilis (option A) and Enterococcus faecalis (option B) are bowel commensals but do not produce triple phosphate stones and so these answers are incorrect.

Escherichia coli is a common urinary tract pathogen but it is not associated with triple phosphate stones and so option C is wrong.

Staphylococcus aureus is rarely a urinary pathogen and is not associated with the production of triple phosphate stones. Option E is therefore incorrect.

Reference:

Moe OW. Kidney Stones: pathophysiology and medical management. Lancet. 2006 Jan 28;367(9507):333-44



[Q: 1482] OnExamination 2012 - Nephrology

A 78-year-old gentleman is admitted with diarrhoea, recent onset of atrial fibrillation, acute renal failure and abdominal pain.

Some of his laboratory parameters are shown below:

Sodium 146 mmol/L (135-145)

Potassium 3 mmol/L (3.5-5.0)

Bicarbonate 14 mmol/L (24-30)

Chloride 95 mmol/L (95-105)

Urea 30 mmol/L (2.5-6.5)

What is the anion gap of this patient?

- 1- 24
- 2- 30
- 3- 40
- 4- 45
- 5- 48

Answer & Comments

Answer: 3- 40

The anion gap is an estimate of the unmeasured anions in the serum and helps to differentiate the causes of metabolic acidosis.

This gentleman has a significantly raised anion gap possibly secondary to ischaemic bowel and lactic acid production.

Note that the serum urea is not involved in the calculation of the anion gap.



[Q: 1483] OnExamination 2012 - Nephrology

A 45-year-old gentleman presents with loin pain and haematuria and is found on ultrasound examination to have polycystic kidney disease.

Of note, his father died of a brain haemorrhage in his 50s. Genetic testing reveals that the patient has the PKD-1 gene mutation.

On which chromosome is this gene mutation found?

- 1- Chromosome 2
- 2- Chromosome 4
- 3- Chromosome 12
- 4- Chromosome 15
- 5- Chromosome 16

Answer & Comments

Answer: 5- Chromosome 16

The PKD-1 gene mutation is found on chromosome 16p and so option E is correct.

The PKD-2 gene mutation is found on chromosome 4 and gives rise to a milder phenotype. Option B is therefore incorrect.

The other chromosomes do not contain the PKD-1 gene and so options A, C and D are also incorrect.

Reference:

Wilson, PD. Polycystic Kidney Disease. *N Engl J Med.* 2004 Jan 8;350(2):151-64.



[Q: 1484] OnExamination 2012 - Nephrology

A 22-year-old woman who is taking long term doxycycline for severe acne comes to the clinic complaining of chronic thirst and polyuria. She has to pass urine two to three times per night, which is highly unusual for her.

There is no significant past medical history, and her only medication is the oral contraceptive pill.

On examination her lying BP is 136/80 mmHg, with a postural drop of 15 mmHg. Her BMI is 29. There were no other significant findings on physical examination.

Investigations show

Haemoglobin 13.8 g/dl(11.5-16.5)

White cells $6.3 \times 10^9/L$ (4-11)

Platelets $222 \times 10^9/L$ (150-400)

Sodium 141 mmol/l (135-146)

Potassium 4.8 mmol/l (3.5-5)

Creatinine 122 $\mu\text{mol/l}$ (79-118)

Urea 8.5 mmol/l (2.5-6.7)

Which of the following is the most appropriate treatment?

- 1- Discontinue the doxycycline
- 2- Fluid restrict her
- 3- Increase her oral fluid intake
- 4- Intranasal vasopressin
- 5- Oral bendroflumethiazide

Answer & Comments

Answer: 1- Discontinue the doxycycline

Tetracyclines are known to be a cause of nephrogenic diabetes insipidus, as are

Lithium

Certain anti-fungals

Certain anti-viral agents.

Whilst increasing her oral intake may relieve some of her symptoms of thirst, discontinuing the doxycycline is the only way to resolve both her thirst and her polyuria.

High dose intranasal vasopressin may relieve her symptoms but the most appropriate treatment is discontinuation of the tetracycline antibiotic.



[Q: 1485] OnExamination 2012 - Nephrology

A 65-year-old man presents with renal colic. The following day he passes a stone in his urine with analysis revealing that it is composed of uric acid.

Which one of the following is the most likely cause of this type of renal stone?

- 1- Allopurinol
- 2- Chronic renal failure
- 3- Primary hyperparathyroidism
- 4- Secondary polycythaemia
- 5- Thiazide diuretics

Answer & Comments

Answer: 5- Thiazide diuretics

Uric acid stones occur in 5-25% of all cases of nephrolithiasis. They are associated with hyperuricaemia and hyperuricosuria.

Predisposing factors for uric acid stone formation are:

Dehydration

High purine load (high protein diet)

As a primary factor in idiopathic gout

Associated with high cell turnover (for example, haematological malignancy).

Chronic renal failure is incorrect, as there is hyperuricaemia without hyperuricosuria.

Hyperparathyroidism is associated with calcium stones, not uric acid stones.

Primary polycythaemia would predispose to uric acid stone formation, whereas secondary polycythaemia does not.

Allopurinol is prescribed to treat gout and prevents uric acid formation, hence it reduces the frequency of uric acid stones.

The correct answer is thiazide diuretics. Thiazide diuretics cause hyperuricaemia and can predispose to hyperuricosuria and uric acid stone formation. Uric acid stones are also associated with underlying hypertension.

Thiazide diuretics are used to treat calcium stones as they increase the reabsorption of calcium from the proximal tubules, preventing hypercalciuria.



[Q: 1486] OnExamination 2012 - Nephrology

An 18-year-old female student attends the clinic as her father has just died with end-stage renal failure. He had been diagnosed with autosomal dominant polycystic kidney disease (ADPKD).

She wishes to know what investigations she requires.

Which of the following is an appropriate strategy in her management?

- 1- Geneticist referral
- 2- Glomerular filtration rate estimation
- 3- MRI brain
- 4- Ultrasound of the renal tract
- 5- Urine dipstick

Answer & Comments

Answer: 1- Geneticist referral

An ultrasound of the renal tract may not be appropriate at this patient's age, given that cysts may not become apparent until the age of 20.

Gross haematuria in ADPKD carries a poor prognosis however microscopic haematuria may be a complication.

Subarachnoid haemorrhage may be a cause of mortality in 9% of patients with ADPKD, though 8% of patients have an asymptomatic intracranial aneurysm; if the diagnosis is confirmed and there is a strong history of subarachnoid haemorrhage then an MRI would be indicated.

Genetic counselling is most appropriate in this context and genetic linkage analysis may be utilised.



[Q: 1487] OnExamination 2012 - Nephrology

A 79-year-old woman presents to the Emergency department following a mechanical fall, resulting in a left fractured neck of femur and a long-lie of 14 hours.

She is oliguric; her urine is dark in colour and shows 4+ to haemoglobin on urine dipstick.

Which of the following is consistent with a diagnosis of rhabdomyolysis?

- 1- Hypocalcaemia
- 2- Hypokalaemia
- 3- Hyponatraemia
- 4- Hypophosphataemia
- 5- Thrombocytopenia

Answer & Comments

Answer: 1- Hypocalcaemia

Her urine is dark due to myoglobin.

Dipstick will be positive for blood (a false positive). On microscopy no red cells are seen although there may be pigmented granular casts.

As serum calcium is bound to damaged muscle, rhabdomyolysis may result in hypocalcaemia. Around 20% of patients

become hypercalcaemic during recovery as this bound calcium is remobilised.

Hypokalaemia is not a typical feature of rhabdomyolysis. Instead, hyperkalaemia may be present and is a life-threatening complication of the syndrome. It occurs because potassium is released from necrotic myocytes and this is exacerbated in the context of acute kidney injury and metabolic acidosis.

However, severe hypokalaemia is considered as one of the causes of rhabdomyolysis.

Hyponatraemia is not a typical feature of rhabdomyolysis. Instead, sodium may be high if the patient is water deplete following trauma.

Hypophosphataemia is not a typical feature of rhabdomyolysis. Phosphate may instead be normal or high. However, severe hypophosphataemia is considered as one of the causes of rhabdomyolysis.

Thrombocytopenia would warrant consideration of an alternate diagnosis. It is not a typical feature of rhabdomyolysis.



[Q: 1488] OnExamination 2012 - Nephrology

A 60-year-old male presents with typical renal colic and one day later passes a small stone.

However, the original x ray of the abdomen revealed no obvious calculi.

What is the most likely composition of his calculus?

- 1- Calcium
- 2- Cystine
- 3- Oxalate
- 4- Phosphate
- 5- Uric acid

Answer & Comments

Answer: 5- Uric acid

The main constituent will be uric acid.

Major causes of stone formation:

Calcium stones (80%) - hypercalciuria (for example, primary hyperparathyroidism), hyperoxaluria (for example, XS intake, ileal disease and bypass)

Uric acid stones (10%) - high purine intake, high cell turnover

Cystine stones (2%) - cystinuria (AR defect in dibasic amino acid transporter)

Infection stones (5%) - chronic infection with urea splitting organisms causes stones made of magnesium ammonium phosphate and calcium phosphate

Other stones (3%) - include xanthine stones, rare renal chloride channel mutations can cause stone formation.

There appears to be a male predominance with a 2:1 ratio.

Calcium and infection stones are radio-opaque, cystine stones are weakly radio-opaque and urate stones are radiolucent.



[Q: 1489] OnExamination 2012 - Nephrology

A 42-year-old female is admitted following an overdose of diazepam and alcohol.

On examination she was unconscious with a core temperature of 34.5°C and a blood pressure of 110/80 mmHg.

Investigations reveal:

Creatinine 242 µmol/l (60-100)

AST 500 U/l (0-40)

Gamma GT 35 U/l (<50)

Urine microscopy No cells or organisms

Urine dipstick analysis blood+++

Ultrasound abdomen Normal

Which one of the following is the most likely cause of these findings?

- 1- Associated paracetamol poisoning
- 2- Chronic renal failure
- 3- Dehydration
- 4- Hypothermia
- 5- Rhabdomyolysis

Answer & Comments

Answer: 5- Rhabdomyolysis

This patient has taken an overdose of diazepam and has collapsed for an indeterminate period. She is now seen with renal impairment.

The features together with the elevated amino transferase (AST) (from muscle) suggest a diagnosis of rhabdomyolysis.



[Q: 1490] OnExamination 2012 - Nephrology

A 58-year-old man with longstanding hypertension was found to have a serum creatinine concentration of 275 µmol/L (60-110).

Urinalysis showed blood ++ and protein >1 g/L. Renal ultrasound showed the left kidney to be 9.2 cm long, the right to be 8.9 cm long (normal range for both kidneys 10-12 cm), and neither kidney was obstructed.

What is the best investigation to diagnose the cause of the renal impairment?

- 1- Intravenous urography
- 2- Isotope renography
- 3- Renal arteriography
- 4- Renal biopsy
- 5- Retrograde pyelography

Answer & Comments

Answer: 4- Renal biopsy

The presence of long standing hypertension, haematuria, significant non-nephrotic proteinuria is highly suspicious of glomerular

pathology, such as IgA nephropathy which is best characterised by a renal biopsy.

In the absence of obstruction on ultrasound, intravenous urography, retrograde pyelography, and isotope renography are not appropriate.

Renal size asymmetry in the presence of hypertension and renal impairment might prompt the search for renovascular disease. However in this case of kidneys are of similar and good size.



[Q: 1491] OnExamination 2012 - Nephrology

A 32-year-old woman with IgA nephropathy attended the clinic shortly after having a positive pregnancy test.

On physical examination, pulse rate was 60 / minute and blood pressure was 145/83 mmHg. Fundi and cardiac examinations were normal. There was no pedal oedema.

Urine protein measured 0.7 g daily. Her serum creatinine level was 60 µmol/L. Medications at that time were lisinopril and folic acid.

Which of the following recommendations is most appropriate?

- 1- Continue the folic acid and lisinopril
- 2- Continue the folic acid and lisinopril, but advise to stop lisinopril in the second half of pregnancy
- 3- Change lisinopril to losartan
- 4- Stop lisinopril
- 5- Target blood pressure of < 120/80 mmHg during pregnancy

Answer & Comments

Answer: 4- Stop lisinopril

Both ACE inhibitor and angiotensin-receptor blocker are contraindicated in pregnancy.

The use of ACE inhibitor during the second half of the pregnancy (option B) has been well

known to be associated with oligohydramnios (probably resulting from impaired fetal renal function) and neonatal anuria, and fetal death.

Although the old teaching might allow the use of lisinopril during the first trimester, an observational retrospective cohort study that included women with exposure to ACE inhibitors in the first trimester, as reported in 2006, raised the issue that the drug is associated with increased odds for cardiovascular defects and central nervous system defects.

By extrapolation, other blockers of renin-angiotensin system should also be switched to other class of antihypertensive drugs (before conception, if possible). In other words, options B and C are not appropriate.

Blood pressure goal during pregnancy, in general, is less aggressive (option E); a very tight blood pressure control is linked with an increased risk of fetal growth restriction. Pre-pregnancy doses of antihypertensive medications are not infrequently reduced, particularly in the second trimester.



[Q: 1492] OnExamination 2012 - Nephrology

A 20-year-old woman presents to the acute medical intake with lethargy and confusion.

On examination you note a purpuric rash covering the abdominal wall and thighs and a fever of 38°C. Investigations reveal a haemolytic anaemia, thrombocytopenia and acute kidney injury.

Which feature of the presentation makes the diagnosis of thrombotic thrombocytopenic purpura more likely than haemolytic uraemic syndrome?

- 1- Acute kidney injury
- 2- Confusion
- 3- Fever
- 4- Haemolytic anaemia

5- Thrombocytopenia

Answer & Comments

Answer: 2- Confusion

Thrombotic thrombocytopenic purpura (TTP) and haemolytic uraemic syndrome (HUS) have overlapping clinical features, with up to 60% of TTP patients missing at least one component of the classical pentad, and around 30% of HUS patients having neurological symptoms and fever.

Typically the degree of kidney injury is worse in patients with haemolytic uraemic syndrome.

Neurological symptoms are less common in haemolytic uraemic syndrome.

Acute kidney injury can be present in both conditions. It is typically more severe in haemolytic uraemic syndrome.

Neurological symptoms are much less common in patients presenting with haemolytic uraemic syndrome.

Fever can be present in both conditions.

Haemolytic anaemia can be present in both conditions.

Thrombocytopenia can be present in both conditions.



[Q: 1493] OnExamination 2012 - Nephrology

A 48-year-old woman patient presents to the medical intake with bilateral leg swelling.

Urine dipstick shows 4+ protein and serum albumin is 14 g/l (normal range 35-50 g/l). Renal function is within normal range.

Further urinalysis indicates nephrotic-range proteinuria. Further to this a renal biopsy is performed which shows thickened glomerular capillary loops.

Which of the following may be a cause for this presentation?

- 1- Candida spp.
- 2- Escherichia coli O157:H7
- 3- Helicobacter pylori
- 4- Hepatitis B
- 5- Mycoplasma spp.

Answer & Comments

Answer: 4- Hepatitis B

Secondary causes include:

Autoimmune disease

Infections

Drugs (captopril, gold, nonsteroidal anti-inflammatory drugs [NSAIDs]) or

Malignancy.

Infectious causes of membranous nephropathy include:

Hepatitis B

Hepatitis C

Syphilis

Malaria.

It can also be seen in HIV although this disease is more often associated with a focal glomerulosclerosis.

Candida spp. are not causes of membranous nephropathy.

Although related to haemolytic uraemic syndrome, Escherichia coli O157 is not a cause of membranous nephropathy.

H. pylori is related to peptic ulcer disease and is not a cause of membranous nephropathy.

Hepatitis B is a secondary cause of membranous nephropathy and patients with this syndrome should be tested.

Although a cause of atypical pneumonia, Mycoplasma spp. is not a cause of membranous nephropathy.



[Q: 1494] OnExamination 2012 -
Nephrology

You are asked to see an orthopaedic patient who developed renal failure after a two week course of gentamicin.

No features of hypovolaemia or sepsis are evident. You suspect a diagnosis of aminoglycoside-induced acute tubular necrosis.

Which of the following fit the diagnosis?

- 1- The patient's acute renal failure usually appears within two days of gentamicin
- 2- The patient is non-oliguric.
- 3- The urine microscopy shows active red cell casts.
- 4- We expect an irreversible renal failure.
- 5- All of above

Answer & Comments

Answer: 2- The patient is non-oliguric.

The reversible acute tubular necrosis after aminoglycoside reflects a concurrent impairment in the concentrating ability, and most patients are non-oliguric (option B).

We expect a diagnosis of acute renal failure beginning more than five days after the initiation of gentamicin; option A is incorrect.

The urine sediment (in contrast to the suggestion in option C) should either be benign or show granular or epithelial cell casts.

The doctor's role is to ensure no hypovolaemia, sepsis, or catabolic state, all of which will defer tubular regeneration (recovery).

Irreversible tubulointerstitial damage, however, is uncommon after discontinuing aminoglycoside.



[Q: 1495] OnExamination 2012 -
Nephrology

A 70-year-old woman was referred with a six-week history of painless macroscopic haematuria.

Her only medications were IM sodium aurothiomalate and oral ibuprofen, which she took for rheumatoid arthritis.

Investigations:

Serum creatinine 92 $\mu\text{mol/L}$ (60-110)

Urine dipstick blood ++++

Protein +

Abdominal plain x ray normal

Ultrasound kidneys and renal tract normal

Which one of the following is the best initial investigation?

- 1- Cystoscopy
- 2- Intravenous urogram (IVU)
- 3- Renal biopsy
- 4- Stop ibuprofen
- 5- Stop sodium aurothiomalate

Answer & Comments

Answer: 1- Cystoscopy

This lady has macroscopic haematuria and a trace of protein in the urine. She is taking ibuprofen and IM sodium aurothiomalate (gold). Her renal function is normal, as is the plain abdominal x ray and USS renal tract.

Ibuprofen is a common cause of interstitial nephritis, and this could present with painless haematuria.

Sodium aurothiomalate commonly causes trace proteinuria, and if present on its own is unimportant, but it can also cause membranous glomerulonephritis, which this lady could have.

However, the most important thing to exclude would be a bladder tumour initially before

embarking upon a renal biopsy. Therefore cystoscopy is the best initial investigation.



[Q: 1496] OnExamination 2012 - Nephrology

A 60-year old man with a history of non-small cell lung cancer was treated with a right lower lobectomy 12 months ago.

He had an abdominal CT scan one month ago which revealed hepatic mass lesions and hilar lymphadenopathy. He now presents with malaise and fatigue.

His results show:

Urinalysis Protein +++

24 hour urine protein 2.7 g/24hr

Serum urea 30 mmol/L (2.5-7.5)

Serum creatinine 450 µmol/L (60-110)

A renal biopsy shows focal deposition of IgG and C3 with a granular pattern.

What is the most likely diagnosis?

- 1- Goodpasture's syndrome
- 2- Membranous glomerulonephritis
- 3- Minimal change glomerulonephritis
- 4- Nodular glomerulosclerosis
- 5- Rapidly progressive glomerulonephritis

Answer & Comments

Answer: 2- Membranous glomerulonephritis

Membranous GN is associated with:

Malignancy

Elderly patients, male more than female

Medications: penicillamine, GOLD, captopril, and heavy metals: mercury and cadmium

Basement membrane thickening

Rheumatoid arthritis

Autoimmune disease: systemic lupus erythematosus (SLE), thyroid

Nephrotic syndrome is the main presentation

Hepatitis B

Odd infections - like syphilis, leprosy, HIV, schistosomiasis, malaria

Immune complex deposition with IgG and C3

Sickle cell disease.

Forty per cent remit without treatment, 30% develop endstage renal failure (ESRF).



[Q: 1497] OnExamination 2012 - Nephrology

A patient with end stage renal disease is receiving haemodialysis and erythropoietin.

Which of the following does erythropoietin therapy cause?

- 1- Benign intracranial hypertension
- 2- Hypotension
- 3- Myositis
- 4- Osteoporosis
- 5- Seizures

Answer & Comments

Answer: 5- Seizures

Hypertension is a frequent problem associated with erythropoietin and may induce seizures.

A particular symptom is the onset of sudden stabbing migraine-like headache and should raise awareness to the possibility of hypertensive crisis.

Other adverse effects of treatment with erythropoietin include:

Hyperkalaemia in uraemic patients

Increased packed cell volume (PCV) (especially with misuse by normal individuals)

Thrombocythaemia

Shunt thrombosis

Induction of iron deficiency
Skin rashes
Urticaria and
Flu-like illness.



[Q: 1498] OnExamination 2012 -
Nephrology

A 56-year-old gentleman established on peritoneal dialysis presents with abdominal pain, fever and cloudy drainage.

A diagnosis of peritoneal dialysis (PD) peritonitis is suspected.

Which of the following laboratory findings is most useful in establishing the diagnosis of PD peritonitis?

- 1- Doubling in serum C reactive protein (CRP)
- 2- Doubling in serum creatinine
- 3- Neutrophils consisting 10% of total white cell count (WCC) in PD fluid
- 4- Raised serum amylase
- 5- White cell count > 100/ mm³ in PD fluid sample

Answer & Comments

Answer: 5- White cell count > 100/mm³ in PD fluid sample

PD peritonitis is an important complication of peritoneal dialysis. The vignette describes a typical presentation.

A high suspicion for the diagnosis is required and empirical treatment is often started.

PD fluid WCC of greater than 100/mm³ is diagnostic of PD peritonitis and should be selected.

Raised serum CRP may be associated but is not necessarily diagnostic.

Likewise, doubling of serum creatinine may have multiple reasons and should not be selected.

Although amylase may be raised there can be other intra-abdominal causes.

A PD fluid neutrophil percentage of greater than 50% and not 10% is in keeping with PD peritonitis.



[Q: 1499] OnExamination 2012 -
Nephrology

A 46-year-old woman develops nephrotic syndrome and is awaiting further tests to establish the underlying aetiology.

In which circumstance would corticosteroids be most effective in reversing the nephrotic syndrome?

- 1- Membranous nephropathy
- 2- Mesangial IgA disease
- 3- Minimal change disease
- 4- Primary amyloidosis
- 5- Renal vein thrombosis

Answer & Comments

Answer: 3- Minimal change disease

Although there is no known effective treatment for IgA nephropathy, there have been reports of favourable response to long term corticosteroid therapy.

80% adults with minimal change glomerulonephritis (GN) will respond to steroids, although remissions can take up to 16 weeks.

Membranous GN does not respond to steroid treatment.

No specific treatment is available to cause regression of amyloid deposits.



[Q: 1500] OnExamination 2012 -
Nephrology

A 65-year-old gentleman with type 2 diabetes mellitus and hypertension is started on an ACE-inhibitor.

Which of the following is the most appropriate time period to check his creatinine and potassium after commencing the medication?

- 1- 24 hours after starting the medication
- 2- 48 hours after starting the medication
- 3- One to two weeks after starting the medication
- 4- Six hours after he takes the medication
- 5- Two months after starting the medication

Answer & Comments

Answer: 3- One to two weeks after starting the medication

Monitoring of renal function and potassium is important after commencement of an ACE inhibitor.

The optimum period to check this is one to two weeks after commencing the medication.

Six, 24 and 48 hours after starting the medication are too early to detect relevant changes. These answers should not be selected.

Two months after starting the medication is too late and should not be selected.



[Q: 1501] OnExamination 2012 - Nephrology

A 7-year-old boy is brought to the surgery by his mother. He has become unwell with severe diarrhoea which is now mixed with blood.

History of note is a visit to a model farm a few days earlier. He is nauseous, has a severe headache, and feels very unwell.

On examination he is pyrexial 38.2°C, his BP is 142/88 mmHg. He has a soft, diffusely tender abdomen.

Investigations show

Haemoglobin 9.2 g/dl(13.5-18)

White cell count 11.9 x 10⁹/L (4-10)

Platelets 76 x 10⁹/L (150-400)

Sodium 141 mmol/l (134-143)

Potassium 4.9 mmol/l (3.5-5)

Creatinine 192 µmol/l (60-120)

Bilirubin 92 µmol/l (<17)

Urine Blood ++

Protein ++

Which of the following is the most likely diagnosis?

- 1- Brucella infection
- 2- Campylobacter infection
- 3- Escherichia coli infection
- 4- Salmonella infection
- 5- Shigella infection

Answer & Comments

Answer: 3- Escherichia coli infection

The symptoms, signs and investigations are typical of Escherichia coli 157 infection, leading to haemolytic-uraemic syndrome (HUS).

The syndrome is characterised by:

Microangiopathic haemolytic anaemia

Thrombocytopenia

Acute renal failure.

The most likely route of infection is his trip to the model farm.

Unfortunately antibiotics confer no benefit and may increase the risk of neurological complications associated with HUS.

This patient should be referred urgently to the hospital for management of his fluid and electrolyte balance. Unfortunately fatality rates from HUS remain high, at between 5 and 10%.



[Q: 1502] OnExamination 2012 -
Nephrology

A 62-year-old man with a history of type 2 diabetes and renal failure comes to the Emergency department. He currently uses continuous ambulatory peritoneal dialysis, and has noticed an increase in his insulin requirements over the past 24 hours, dull abdominal pain, and now has a cloudy bag.

On examination he is pyrexial 37.8°C and looks unwell, his blood pressure is 142/88 mmHg, with a pulse of 90. His abdomen is generally tender to palpation.

Investigations show:

Haemoglobin 10.4 g/dl(13.5-18)

White cell count $13.6 \times 10^9/L$ (4-10)

Platelets $190 \times 10^9/L$ (150-400)

Sodium 137 mmol/l (134-143)

Potassium 5.3 mmol/l (3.5-5)

Creatinine 342 $\mu\text{mol/l}$ (60-120)

CRP 88(<10)

Peritoneal dialysis fluid >100 white cells/cm²

Which of the following organisms is most likely to be responsible?

- 1- C. albicans
- 2- S. aureus
- 3- S. faecalis
- 4- S. pyogenes
- 5- S. viridians

Answer & Comments

Answer: 2- S. aureus

Staphylococcus aureus, Staphylococcus epidermidis, Pseudomonas aeruginosa, and Escherichia coli are the commonest causes of peritonitis in peritoneal dialysis patients. Severe infections may be polymicrobial.

Treatment with intraperitoneal antibiotics is superior to intravenous antibiotics.

Persistent or recurrent peritonitis should prompt catheter removal.



[Q: 1503] OnExamination 2012 -
Nephrology

A 32-year-old female is diagnosed with Goodpasture's syndrome.

Which of the following therapies used in conjunction with plasmapheresis and corticosteroids would be expected to improve prognosis associated with the condition?

- 1- Azathioprine
- 2- Cyclophosphamide
- 3- Cyclosporin
- 4- Mycophenolate mofetil
- 5- Tacrolimus

Answer & Comments

Answer: 2- Cyclophosphamide

Studies reveal that without treatment mortality is as high as 90% in association with Goodpasture's.

However the prognosis is drastically improved with the removal of antigen through plasmapheresis, immunosuppression with corticosteroids and cyclophosphamide.

There are some studies revealing the potential of mycophenolate mofetil but the evidence is rather anecdotal.



[Q: 1504] OnExamination 2012 -
Nephrology

A 21-year-old female presents with joint pains and rash. On examination her blood pressure was 140/100 mmHg.

Investigations reveal:

Creatinine 90 $\mu\text{mol/l}$ (60-110)

Anti dsDNA antibodies Strongly positive(0-73)

24 hour urinary protein excretion 1.7 g(<0.2)

Renal biopsy Membranous nephropathy

What is the most appropriate next treatment for her nephropathy?

- 1- ACE inhibitor for blood pressure control
- 2- Cyclophosphamide
- 3- NSAIDs for arthralgia
- 4- Prednisolone for immunosuppression
- 5- Warfarin anticoagulation

Answer & Comments

Answer: 1- ACE inhibitor for blood pressure control

This patient has systemic lupus erythematosus with the disease affecting her kidneys.

The renal manifestations of SLE are highly variable, ranging from mild asymptomatic proteinuria and/or haematuria to rapidly progressive uraemia. The various presentations are difficult to classify into clinical syndromes and histological classes. Although lupus nephritis affects a third of patients early in the disease it is frequently unrecognised until nephritic and/or nephrotic syndrome with renal failure occur.

Histologically, a number of different types of renal disease are recognised in SLE, with immune-complex mediated glomerular disease being the most common. The up to date International Society of Nephrology/Renal Pathology Society 2003 classification divides these into six different patterns:

- I - minimal mesangial
- II - mesangial proliferative
- III - focal
- IV - diffuse
- V - membranous
- VI - advanced sclerosis

Patients with membranous lupus nephritis tend to present with nephrotic syndrome.

Microscopic haematuria and hypertension may also be seen. Biopsies show global or segmental subepithelial immune deposits or their morphologic sequelae, with or without mesangial alterations. It may occur in combination with class III or IV, in which case both are diagnosed. Progression is variable, and immunosuppression is not always needed. Cyclophosphamide, mycophenolate mofetil and azathioprine reduce mortality in proliferative forms of lupus glomerulonephritis, but the benefit is not clear in membranous forms.

More important to this patient's renal disease in this patient is aggressive blood pressure control. An angiotensin-converting enzyme (ACE) inhibitor would be first line, as it has been shown to reduce proteinuria independently of its effect on blood pressure.

Warfarin is not considered an appropriate treatment as this lady has not exhibited any prothrombotic tendencies.

Non-steroidal anti-inflammatory medication would treat her arthralgia but would have no effect on the prognosis of the disease.

Therefore the correct answer should be A, but immunosuppression may well be required to manage her extra-renal disease.



[Q: 1505] OnExamination 2012 - Nephrology

A 65-year-old female is referred with a long history of hypertension and episodic urinary tract infections.

Dipstick analysis of the urine shows blood +++ together with protein +++. Her urea is 20 mmol/L (2.5-7.5) and creatinine is 280 µmol/L (60-110).

An ultrasound of abdomen is requested and shows left and right kidneys of 9 cm in size (10-12) without evidence of obstruction.

Which one of the following is the best investigation to diagnose the cause of her renal failure?

- 1- Isotope renography
- 2- IV urography
- 3- Renal angiography
- 4- Renal biopsy
- 5- Retrograde pyelography

Answer & Comments

Answer: 4- Renal biopsy

This patient has impaired renal function with hypertension and significant proteinuria and haematuria (glomerulonephritis). The kidneys are smaller than expected with no evidence of obstruction.

Intravenous urography is not the investigation of choice in a patient with impaired renal function.

Isotope renography would provide information about the relative function of each kidney and would show areas of scarring due to renal stone disease, infection, or vascular disease. It would also exclude congenital malformations of the kidneys. Although useful it would not provide information on the cause of the haematuria and proteinuria.

Renal angiography is the gold standard for assessing renovascular disease. It is an invasive procedure with potential complications. This investigation would not exclude causes of proteinuria and haematuria.

Retrograde pyelography would be useful if there were any evidence of obstruction.

The best investigation is a renal biopsy. This would show any changes of glomerulonephritis along with renal scarring from longstanding hypertension or urinary tract infections.



[Q: 1506] OnExamination 2012 - Nephrology

A 60-year-old man wishes to act as a kidney donor to his 37-year-old wife.

She has end stage renal failure from polycystic kidney disease and is maintained on peritoneal dialysis.

The couple have two teenage daughters, neither of whom have renal cysts on recent ultrasound scans.

Which one of the following statements is correct?

- 1- Living related donation from one of the daughters would be preferable to donation from the husband
- 2- Living unrelated donation is not recommended in cases of inherited renal disease
- 3- The age difference between husband and wife is a relative contraindication to transplantation
- 4- The husband should not be accepted for kidney donation until all siblings have been considered
- 5- The results of living unrelated kidney donation are sufficiently poor that organ donation should not proceed

Answer & Comments

Answer: 4- The husband should not be accepted for kidney donation until all siblings have been considered

Providing there is a sibling who is proven not to have polycystic kidney disease, living related donation should be considered as this would ensure a better match and better graft survival. Siblings are close genetically, and therefore usually are a better match than spouses. The age difference is not, however, a contraindication to kidney donation.

Living unrelated kidney donation could also be considered, and is increasing in use in the UK.

In patients with polycystic kidney disease, or for other inherited diseases, a graft from an unrelated donor would not necessarily succumb to the same disease process. Results are usually excellent if a good match is found. This is usually organised by being on the transplant waiting list, therefore receiving a kidney from a family member is often quicker.

As polycystic kidney disease is inherited as an autosomal dominant condition, there is a significant (50%) risk that this lady's daughters have been affected. Obviously, if affected they are not suitable to act as renal transplant donors. Cysts usually develop during teenage years, so one cannot be confident a child has not been affected until they are at least 20: a normal ultrasound scan at 20 years of age means you can be 90% confident they are not affected, a normal scan at 30 increases the confidence level to 98%. Therefore this lady's siblings (who presumably are all adults) should be considered prior to her children, as those siblings affected by the condition should already be showing the phenotype.



[Q: 1507] OnExamination 2012 - Nephrology

A 43-year-old man has had vague malaise for three weeks.

Physical examination is normal, except for a blood pressure of 150/95 mmHg and pitting oedema of the legs to the knees.

Dipstick urinalysis shows no glucose, blood, ketones, nitrite, or urobilinogen, and the microscopic urinalysis reveals no RBC/hpf and only 1 WBC/hpf.

Additional laboratory testing reveals a 24 hour urine protein of 4.1 gm. His serum creatinine is 350 µmol/L (60-110) with urea of 30 mmol/L (2.5-7.5). His hepatitis B surface antigen is positive.

Which of the following conditions is he most likely to have?

1- Acute tubular necrosis

2- Diabetic nephropathy

3- Membranous glomerulonephritis

4- Post-streptococcal glomerulonephritis

5- Systemic lupus erythematosus

Answer & Comments

Answer: 3- Membranous glomerulonephritis

Membranous glomerulonephritis is an antibody mediated disease in which the immune complexes localise to the subepithelial aspect of the capillary loop. That is, between the outer aspect of the basement membrane and the podocyte (epithelial cell).

The immune complexes develop in situ or, less likely, by the deposition of circulating immune complexes. The antibody may bind to an intrinsic glomerular antigen or to an exogenous antigen planted on the capillary wall.

Approximately 25 to 30% of cases are secondary.

Common associations include:

Systemic lupus erythematosus and other connective tissue disorders

Drugs (gold, penicillamine, non-steroidal anti-inflammatory agents)

Hepatitis B, syphilis, quartan malaria, leprosy, schistosomiasis

Carcinoma, melanoma, leukaemia, non-Hodgkin's lymphomas.

Membranous glomerulonephritis is more common in adults and most patients are older than 30 years at diagnosis. Membranous glomerulonephritis accounts for 35-50% of cases of adult nephrotic syndrome.

Most patients present with heavy proteinuria, most commonly in the nephrotic range, that is insidious in onset. A few patients have accompanying microscopic haematuria.



[Q: 1508] OnExamination 2012 -
Nephrology

Which one of the following statements regarding renal function is correct?

- 1- A ten minute period of hyperventilation will normally be expected to lead to an increased rate of bicarbonate excretion in urine
- 2- Sodium reabsorption in the tubules is mainly controlled by aldosterone
- 3- The daily solute excretion will lie between 75 and 300 mosmol
- 4- The permeability of the proximal nephron to water increases in the presence of vasopressin
- 5- The rate of ammonium excretion in urine is inversely related to the rate of urinary hydrogen ion excretion

Answer & Comments

Answer: 1- A ten minute period of hyperventilation will normally be expected to lead to an increased rate of bicarbonate excretion in urine

Arginine vasopressin (AVP) acts on the collecting ducts increasing permeability to water.

The total solute excretion is approximately 700 mosmol/d.

Sodium reabsorption is mostly through active transport in the loop of Henle with only a modest reabsorption facilitated by aldosterone.

A ten minute period of hyperventilation would cause a respiratory alkalosis leading to an increased secretion of bicarbonate and retention of hydrogen ions.

The rate of ammonium excretion is proportional to the rate of hydrogen ion excretion.



[Q: 1509] OnExamination 2012 -
Nephrology

A 14-year-old boy visits his general practitioner complaining of feeling unwell, passing smoky dark urine and having swelling of his ankles.

Of note he reports a sore throat two weeks prior. His anti-streptolysin O titre is positive and his renal function is mildly impaired.

If this patient were to have a renal biopsy, *which of the following is the most likely finding?*

- 1- C4d staining positive
- 2- Effacement of podocytes on electron microscopy
- 3- Humps in the subepithelial space on electron microscopy
- 4- IgA deposition in the mesangium
- 5- Tram track pattern on light microscopy

Answer & Comments

Answer: 3- Humps in the subepithelial space on electron microscopy

Not all cases of post-streptococcal glomerulonephritis (GN) require a biopsy.

The characteristic electron microscopy findings are described in the correct option.

C4d staining positive is incorrect as this refers to detection of BK virus by the C4d stain.

Podocyte effacement is incorrect as this is diagnostic of minimal change disease.

IgA deposition in the mesangium is a biopsy finding in IgA nephropathy and so is incorrect.

The tram track appearance on light microscopy represents membranoproliferative glomerulonephritis and therefore should not be selected.



[Q: 1510] OnExamination 2012 -
Nephrology

Which of the following is true concerning metastatic calcification in chronic renal failure (CRF)?

- 1- Characteristically caused by calcium oxalate deposition
- 2- Decreased by vitamin D
- 3- Increased prevalence with time on haemodialysis
- 4- Rapidly reversed in all sites after parathyroidectomy
- 5- Unaffected by time on CAPD

Answer & Comments

Answer: 3- Increased prevalence with time on haemodialysis

CRF is associated with:

- Low serum calcium
- Hyperphosphataemia
- Increased parathyroid hormone (PTH)
- Reduced intestinal calcium absorption
- Raised alkaline phosphatase.

Parathyroidectomy improves extraskeletal calcification, but vascular calcification improves less than periarticular calcification.

Metastatic calcification is due mainly to calcium phosphate deposition, although CRF managed with dialysis is the commonest cause of secondary oxalosis (acute arthritis of small joints with digital calcific deposits).

Prolonged treatment with vitamin D (hence hypercalcaemia and hyperphosphataemia) increases extraskeletal calcification.



[Q: 1511] OnExamination 2012 -
Nephrology

A man developed *Helicobacter pylori* related duodenal ulcer after kidney transplantation.

He did not use aspirin; other concurrent medication included cyclosporine, prednisolone, azathioprine and amlodipine. The patient reported no known drug allergy.

What is the most reasonable eradication treatment regimen?

- 1- Bismuth + pantoprazole + metronidazole + tetracycline
- 2- Monotherapy with proton pump inhibitor
- 3- Pantoprazole + amoxicillin
- 4- Pantoprazole + amoxicillin + clarithromycin
- 5- Pantoprazole + metronidazole + clarithromycin

Answer & Comments

Answer: 1- Bismuth + pantoprazole + metronidazole + tetracycline

Clarithromycin is relatively contraindicated in kidney transplant recipients because of its interaction with cyclosporine.

Quadruple therapy containing a proton pump inhibitor, bismuth, metronidazole, and tetracycline (option A), has been shown in meta-analysis of comparative randomised controlled trials to achieve a similar eradication rate to clarithromycin-based triple therapy.

Monotherapies and dual therapies (options B and C) - usually a proton pump inhibitor and one antibiotic - have always had disappointing results in eradication of *Helicobacter pylori*.

Options D and E are theoretically effective in *H. pylori* infection, but clarithromycin interacts with cyclosporine. Being an enzyme inhibitor, this macrolide will result in an (undesirable) increase the blood level of cyclosporine.

Bismuth-based quadruple therapy (option A), as recommended in the Maastricht Consensus Report, is the main option for second-line therapy.



[Q: 1512] OnExamination 2012 -
Nephrology

A 72-year-old man with chronic kidney disease and atrial fibrillation was followed up in the outpatient clinic. The doctor requested an elective colonoscopy examination.

This patient has been taking dabigatran (an oral thrombin inhibitor). His estimated creatinine clearance was 30 ml/min/1.73 m².

How should we advise the patient before colonoscopy examination?

- 1- Continue the dabigatran
- 2- Stop dabigatran one to two days before colonoscopy
- 3- Stop dabigatran three to five days before colonoscopy
- 4- Stop dabigatran two weeks before colonoscopy
- 5- Check the clotting profile (prothrombin time) and decide the timing of stopping dabigatran before colonoscopy

Answer & Comments

Answer: 3- Stop dabigatran three to five days before colonoscopy

The drug dabigatran has a half life elimination of 12-14 hours in normal subjects; it lasts longer in patients with abnormal kidney function.

For patients with normal creatinine clearance, it is safe to discontinue the drug one to two days before colonoscopy procedure. For the patient in this scenario, it is better to stop the drug three to five days (option C) before the procedure. An even longer period might be considered for those undergoing major surgery, spinal puncture or placement of epidural catheter (in whom complete haemostasis is warranted).

Dabigatran is an oral anticoagulant that should be stopped before colonoscopy. The drug contributes to INR elevation but its effect

cannot be monitored in such manner. Similarly, use of aPTT can only provide an approximation of dabigatran's anticoagulant activity.

It should be noted that there is absence of antidote to reverse rapidly the anticoagulant effects of dabigatran in the case of life-threatening haemorrhage or surgery.

The time to discontinue the drug depends on the patient kidney function. In fact, it is recommended to evaluate renal function prior to (and during) therapy; there is indication-specific dose reduction protocol in patients with moderate renal impairment. Haemodialysis removes around 60% of the drug over two to three hours.

Clearance of the low molecular weight heparin is predominantly by renal route.

Please note that unfractionated heparin's half life is not affected by renal function; it is metabolised by hepatic and vascular endothelial heparinases.



[Q: 1513] OnExamination 2012 -
Nephrology

An elderly man was hospitalised because of viral encephalitis for which he received aciclovir intravenously.

There was a decline in the urine output five days later. A nephrologist in consultation suggested aciclovir-induced acute kidney injury.

Which of the following characteristics are compatible with the diagnosis?

- 1- This patient's renal function typically begins to deteriorate three weeks after aciclovir therapy.
- 2- The mechanism is tubular obstruction.
- 3- Renal ultrasound is expected to show hydronephrosis.
- 4- The urine microscopy does not add information

- 5- The patient should be asymptomatic apart from decrease in the urine output.

Answer & Comments

Answer: 2- The mechanism is tubular obstruction.

Intravenous doses of aciclovir, which has relatively low solubility, can lead to deposition of aciclovir crystals in the renal tubules, resulting in intratubular obstruction and foci of interstitial inflammation. This occurs more often in a dehydrated patient.

The decline in renal function is expected to begin shortly after aciclovir therapy (option A).

No hydronephrosis (option C) is seen because the obstruction is intratubular (and not ureteral).

However, patient will complain of flank or abdominal pain (presumably due to urinary tract obstruction); option E is therefore incorrect.

In some cases, birefringent needle-shaped aciclovir crystals (option D) can be seen in the patient's urine (particularly under polarised light).

This condition can be prevented by prior hydration and slow drug infusion.



[Q: 1514] OnExamination 2012 - Nephrology

A 51-year-old male comes to the surgery complaining of nausea and fatigue. You have previously seen him with symptoms of sinusitis, and a saddle nose deformity.

Most recently he has begun to complain of shortness of breath and a chronic cough.

On examination he is hypertensive at 160/92 mmHg. There are bilateral inspiratory crackles on auscultation of the chest.

Investigations show

Haemoglobin 11.8 g/dl (13.5-18)

White cell count $10.1 \times 10^9/L$ (4-10)

Platelets $182 \times 10^9/L$ (150-400)

Sodium 141 mmol/l (134-143)

Potassium 5.5 mmol/l (3.5-5)

Creatinine 230 $\mu\text{mol/l}$ (60-120)

ESR 72 (<10)

Urine Blood ++

Protein ++

Which of the following is the most likely diagnosis?

1- Goodpasture's syndrome

2- IgA nephropathy

3- Membranous nephropathy

4- Minimal change disease

5- Wegener's granulomatosis

Answer & Comments

Answer: 5- Wegener's granulomatosis

Wegener's granulomatosis is a multi-system disorder characterised by necrotising granulomas of medium and small blood vessels. Patients have constitutional symptoms such as fever, lethargy and weight loss.

Organ specific involvement includes:

Eyes

Upper airway

Lung

Renal

Nervous system

Skin

Joints

Men are affected slightly more often than women and typically present in the fourth or fifth decade. Patients often present with ocular or ENT symptoms for sometime before a diagnosis is made.

Autoimmune profile is likely to reveal a positive circulating anti-neutrophil cytoplasmic antibody (cANCA), and renal biopsy is the usual way to obtain a tissue diagnosis.

Treatment is with high dose steroids and cyclophosphamide, which has revolutionised this disease which is otherwise rapidly fatal.



[Q: 1515] OnExamination 2012 - Nephrology

A 17-year-old boy presented with a non-blanching rash over his legs, a swollen knee and painless frank haematuria.

Investigations revealed:

Serum Creatinine 210 $\mu\text{mol/L}$ (60-110)

Urine dipstick analysis: Blood+++

Urine dipstick analysis: Protein+

Urine culture Negative

Ultrasound of the kidneys Normal

Which glomerular abnormality is most likely to be present at renal biopsy?

- 1- Focal and segmental sclerosis
- 2- Foot process fusion
- 3- Linear deposition of IgG on the basement membrane
- 4- Mesangial deposition of IgA
- 5- Thickening of basement membranes

Answer & Comments

Answer: 4- Mesangial deposition of IgA

The likely diagnosis here is Henoch-Schönlein purpura (HSP).

HSP is an inflammatory disorder of unknown cause characterised by IgA-dominant immune complexes in smaller venules, capillaries and arterioles. It presents with purpura, arthritis (especially ankles and knees), abdominal pains, haematuria and proteinuria.

HSP is often associated with infectious agents such as group A Streptococci and Mycoplasma.

If there is progression to renal impairment then renal histopathology may include minimal change to severe glomerulonephritis that is indistinguishable from IgA nephropathy. However, mesangial Ig A deposits are the most typical features of HSP on renal biopsy.



[Q: 1516] OnExamination 2012 - Nephrology

A 45-year-old man with chronic renal failure presents to clinic complaining of increasing fatigue and weakness.

He receives three hours of haemodialysis, thrice weekly. His blood pressure is measured at 176/110 mmHg pre-dialysis and 166/95 mmHg post-dialysis.

Investigations pre-dialysis show:

Hb 9.5 g/d(13.0-18.0)

Potassium 6.9 mmol/l (3.5-4.9)

Creatinine 1567 $\mu\text{mol/l}$ (60-110)

Calcium(corrected) 2.1 mmol/l (2.2-2.6)

Which of the following options is most appropriate initial management for this patient?

- 1- Give alfacalcidol to correct hypocalcaemia
- 2- Increase the duration of each dialysis session
- 3- Reduce the potassium concentration in the dialysate
- 4- Start erythropoietin to increase haemoglobin level
- 5- Start ramipril to gain better control of his blood pressure

Answer & Comments

Answer: 2- Increase the duration of each dialysis session

Haemodialysis (HD) is a complex area and one which does not need to be completely understood by a general physician, or one early in the stages of training. This question deals with the complex concept of dialysis adequacy. The prime aim of long-term haemodialysis is to remove nitrogenous metabolic end-products, remove fluid and maintain electrolyte, fluid and acid-base equilibrium. Although toxin removal is critical, the removal of any particular toxin is a poor measure of haemodialysis adequacy because the removal rate depends on the pre-dialysis serum concentration. 'Clearance' is therefore used to indicate dialysis adequacy, and most commonly the clearance of urea is used.

Clearance is the ratio of removal rate to blood concentration. Removal rate can be measured instantaneously by sampling blood on either side of the dialyser and multiplying the difference by the inflow rate. Clearance is the removal rate divided by the inflow concentration. However, this only provides a measure of dialysis at one point in time. The adequacy of an entire haemodialysis session is best measured by the fall in solute concentration from before dialysis to after. This is calculated using complex equations and is expressed as Kt/V . The current recommendation for adequate dialysis for three treatments per week are a Kt/V of 1.2. The details are not needed for MRCP but are described in the references below for those who are interested.

A more crude assessment of the adequacy of dialysis can be obtained by noting the magnitude of the decrease in blood urea concentration (the 'urea reduction ratio').

In addition to assessing the reduction in urea, it is standard practice in the UK to take biochemical and haematological measurements before and after haemodialysis sessions at regular intervals (monthly in hospital HD patients and at least 3 monthly in home HD patients). Adequate HD is indicated by pre-dialysis serum bicarbonate levels of 18-

24mmol/l, potassium 4.0-6.0mmol/l, phosphate 1.1-1.7mmol/l, and calcium and albumin within normal range. It is also recommended that pre-dialysis haemoglobin concentration should be maintained between 11.0-12.0g/dl.

Cardiovascular morbidity and mortality remains very high in haemodialysis. Control of blood pressure is central to this, and improving adequacy of dialysis has proven value in overcoming this. Blood pressure varies significantly in HD patients depending on the time taken: pre-dialysis, post-dialysis or inter-dialysis. There is a lack of evidence regarding which value correlates best with long-term outcome. Hypertension pre-dialysis can be used a surrogate marker for inadequate ultrafiltration during haemodialysis. Available evidence indicates that control of a patient's fluid volume influences cardiovascular outcome. Volume and blood pressure are linked and it is therefore important to optimise ultrafiltration and dry weight to control blood pressure. All efforts should be taken to ensure haemodialysis patients are euvolaemic and normotensive, which include counselling on sodium and fluid restriction, adequate ultrafiltration and the use of medication. A high pre-dialysis or inter-dialysis blood pressure may be related to excessive sodium and water ingestion during the inter-dialysis period or a high dialysate sodium level, whereas a high post-dialysis blood pressure may reflect inadequate achievement of dry weight. Weight gain between dialyses of more than 4.8% is associated with increased mortality.

The combination of high pre- and post-dialysis blood pressure, and high pre-dialysis potassium, indicate that this patient is receiving inadequate dialysis. Both procedural issues (insufficient blood flow rate, dialysis time and frequency and needle size) and access issues should be addressed. If these fail to improve the situation a different dialysis

modality should be considered, such as more frequent or sustained haemodialysis. From the available options, increasing the duration of the dialysis session should be done initially.

His haemoglobin is also below the recommended level for a dialysis patient but you need to measure haematinics prior rather than jumping in with EPO treatment. Many haemodialysis patients are iron deplete, and in these cases intravenous iron is indicated rather than EPO in the first instance. Anti-hypertensive medication can be considered if adequate ultrafiltration fails to control this patient's blood pressure.



[Q: 1517] OnExamination 2012 - Nephrology

A 25-year-old woman who is 20 weeks pregnant is diagnosed with pyelonephritis.

She had suffered recurrent urinary infections since childhood and her family history reveals that her mother had a history of hypertension and had been told she had a kidney problem.

Examination was normal and urea and creatinine were both normal.

What is the most likely diagnosis?

- 1- Autosomal dominant polycystic kidney disease
- 2- Bladder outlet obstruction
- 3- Normal physiological urinary stasis of pregnancy
- 4- Reflux nephropathy
- 5- Renal stone disease

Answer & Comments

Answer: 4- Reflux nephropathy

This lady has had recurrent urinary tract infections since childhood and now presents with pyelonephritis. Pyelonephritis is an uncommon infection in pregnancy and requires aggressive treatment with antibiotics.

It is associated with preterm labour in 4% and may lead to fetal distress.

A. The answer is not ADPKD as symptoms do not tend to occur before the age of 40.

B. Bladder outlet obstruction should not occur in pregnancy and would cause hydronephrosis and worsening renal function.

C. Answer C is incorrect as this should not cause pyelonephritis.

E. Renal stone disease does predispose to developing urinary tract infections but is less likely than reflux nephropathy.

The correct answer is reflux nephropathy (D). This lady has a long history of urinary tract infections with probable underlying reflux scarring and this would predispose her to developing pyelonephritis in pregnancy.



[Q: 1518] OnExamination 2012 - Nephrology

A 68-year-old male is referred by his general practitioner with deteriorating hypertension and renal function.

Investigations show:

Serum Creatinine 250 $\mu\text{mol/L}$ (60-110)

Urinalysis + protein

Renal ultrasound scan:

left kidney 9 cm long

right kidney 7 cm, no obstruction (10-12 cm)

Which of the following would be the most appropriate investigation for this patient?

- 1- Intravenous renography
- 2- Isotope renography
- 3- MR angiography
- 4- Renal biopsy
- 5- Retrograde pyelography

Answer & Comments

Answer: 3- MR angiography

The diagnosis is likely to be atherosclerotic renal artery stenosis (RAS) as suggested by the asymmetric reduction in renal size, with mild proteinuria quite common in the condition.

Investigations include captopril renography, magnetic resonance (MR) angiography which is virtually as good as renal arteriography.

None of the other investigations are appropriate for RAS.



[Q: 1519] OnExamination 2012 - Nephrology

Which of the following is a feature of cystinuria?

- 1- A useful response to acidification of urine
- 2- Accumulation of cystine in the kidney
- 3- Autosomal dominant inheritance
- 4- Excessive urinary arginine excretion
- 5- Radiolucent urinary calculi

Answer & Comments

Answer: 4- Excessive urinary arginine excretion

Cystinuria is the commonest inborn error of amino acid transport.

Amino acids excreted in urine are cystine, ornithine, arginine and lysine (mnemonic - COAL).

The renal stones are radio-opaque due to the presence of sulphur.

It is inherited as an autosomal recessive condition.

Management includes alkalinisation along with high fluid intake (>4 L/day); d-penicillamine may also be used.

It is cystinosis that leads to accumulation of cystine in the kidney.



[Q: 1520] OnExamination 2012 - Nephrology

A 35-year-old gentleman presents with new onset renal failure and a non-blanching rash across his legs.

In addition, he describes a history of recurrent sinus infections and nose bleeds.

Which of the following tests are most likely to be diagnostic in this case?

- 1- ANA
- 2- C-ANCA
- 3- P-ANCA
- 4- Rheumatoid factor
- 5- Serum electrophoresis

Answer & Comments

Answer: 2- C-ANCA

Wegener's granulomatosis is disease of granulomatous inflammation involving the kidney, upper respiratory and sinus tracts. It is most often associated with the anti-cytoplasmic ANCA (c-ANCA) positivity.

Anti-nuclear antibody (option A) can be positive in wide range of connective tissue diseases and is not the best diagnostic test listed and so is incorrect.

P-ANCA is associated with microscopic polyangiitis and not Wegener's and so option C should not be selected.

Rheumatoid factor (option D) and serum electrophoresis for myeloma (option E) are not diagnostic tests in this case and so are incorrect.



[Q: 1521] OnExamination 2012 - Nephrology

Which of the following is correct in asymptomatic chronic renal failure (CRF)?

- 1- Decrease in blood pressure accompanied by increase in extracellular fluid

- 2- Increase serum (alkaline phosphatase) mainly due to liver isoenzyme
- 3- Serum ionised (calcium) is normal
- 4- Serum (phosphate) characteristically increased before GFR falls to 30 ml/min
- 5- There is increase in tubular excretion of urate

Answer & Comments

Answer: 3- Serum ionised (calcium) is normal

Urate retention is common feature in CRF.

Total serum (calcium) is reduced or at lower limits of normal but ionised (calcium) is normal unless steps are taken to treat acidosis actively, for example, with sodium bicarbonate.

Plasma phosphate is usually normal until CKD stage 5.

Hyperphosphataemia occurs when glomerular filtration rate (GFR) falls less than 30 ml/min.

Increased bone alkaline phosphatase reflects osteodystrophy.

Hypertension is due largely to salt and water retention, and also overactivity of renin angiotensin systems.



[Q: 1522] OnExamination 2012 - Nephrology

What is the most compatible joint finding of patients suffering from Henoch-Schönlein purpura?

- 1- Erosive arthropathy
- 2- Transient non-deforming oligoarthritis, mostly large joints of the legs
- 3- Symmetrical small hand joints
- 4- Preponderance of temporomandibular joint
- 5- Typical enthesitis

Answer & Comments

Answer: 2- Transient non-deforming oligoarthritis, mostly large joints of the legs

The arthritis of Henoch-Schönlein purpura is usually transient or migratory, involves one to four joints, and is non-deforming (option B). Typical sites are the lower extremity large joints (hips, knees, and ankles). Affected young children may refuse to walk.

Kidney manifestation occurs only in 10-50% of patients with the disease.

Purpura is the sine qua non of Henoch-Schönlein purpura. It may be difficult to diagnose this disease if the patient first presents with kidney involvement or joint manifestation.

Joint disease of Henoch-Schönlein purpura does not cause any chronic damage, as opposed to that of rheumatoid arthritis (hence incorrect for option A).

Symmetrical joint involvement of hands is atypical (hence incorrect option C).

Enthesitis (option E), inflammation of the region of attachment of tendons and ligaments, is a feature of ankylosing spondylitis and other spondyloarthritis.



[Q: 1523] OnExamination 2012 - Nephrology

You were asked to see a 50-year-old man who developed haemoptysis.

Further evaluation showed pulmonary infiltrates and his urine dipstick showed red cells and active urine sediments.

Which of the following evaluations would be most diagnostic?

- 1- A request for anti-glomerular basement membrane (anti-GBM) antibody and antineutrophil cytoplasmic antibody (ANCA).
- 2- A smoking history

- 3- Anti-Smith (Sm) antibodies
- 4- An ultrasound image of the kidneys
- 5- Fractional excretion of sodium

Answer & Comments

Answer: 1- A request for anti-glomerular basement membrane (anti-GBM) antibody and antineutrophil cytoplasmic antibody (ANCA).

Bleeding into alveolar space can be manifested as haemoptysis, and together with renal disease or glomerulonephritis, should prompt an evaluation for systemic vasculitis.

Pulmonary renal syndrome can result from Wegener's granulomatosis or ANCA-associated vasculitis. Goodpasture's syndrome (associated with anti-GBM) is another consideration.

Of interest, smoking (option B) appears to be of relevance in causing an epitope that incites an immune response (and thus alveolar damage and haemoptysis manifestation), but this piece of information would not be of the most diagnostic value.

Kidney biopsy, but not ultrasound alone (option D) is occasionally performed in patients with overt manifestations of renal disease (to look for a segmental necrotising lesion in this case).



[Q: 1524] OnExamination 2012 - Nephrology

A child-bearing woman asked you about the use of angiotensin converting enzyme (ACE) inhibitor in pregnancy.

Choose the best answer in response to her query.

- 1- ACE inhibitors are listed as FDA rating B; they can be used in pregnancy
- 2- ACE inhibitor should be changed to angiotensin receptor blocker before conception.

- 3- The drugs can be continued until second trimester because ACE inhibitor has not been shown to be teratogenic
- 4- ACE inhibitor should be withheld during the first trimester; it is otherwise safe in the second and third trimester.
- 5- ACE inhibitor should not be used during pregnancy.

Answer & Comments

Answer: 5- ACE inhibitor should not be used during pregnancy.

Contrary to previous teaching, a United States study (including 29,507 infants born between 1985 and 2000, 209 of whom were exposed to ACE inhibitors in the first trimester only) showed a significant increase in major (in particular, cardiovascular) congenital malformation. Option C is therefore incorrect.

Second and third trimester exposure to ACE inhibitors (option D) must be avoided because of the association with serious adverse fetal effects, notably oligohydramnios, in utero death, and neonatal anuria and renal failure.

The same probably applies to angiotensin receptor blocker (option B) and direct renin inhibitor (aliskiren).



[Q: 1525] OnExamination 2012 - Nephrology

A 72-year-old man presented with shortness of breath of two month duration. He has been treated for rheumatoid arthritis for the past 30 years.

On examination, his blood pressure was 190/110 mmHg, he had bilateral pitting ankle oedema, fourth heart sound, bilateral basal crackles and arthritic changes in the hands, wrists, ankles and left knee.

Basic investigations revealed the following results:

Sodium 128mmol/l137-144

Potassium 4.2 mmol/l/3.5-4.9

Urea 30 mmol/l/2.5-7.0

Creatinine 610 µmol/l/60-110

Glucose 7.8 mmol/l/3-6

Urinalysis protein +++

Ultrasound KUB: right and left kidneys 10cm and 10.6 cm respectively. No obstruction.

What is the cause of renal failure?

- 1- Acute glomerulonephritis
- 2- Amyloidosis
- 3- Analgesic nephropathy
- 4- Chronic pyelonephritis
- 5- Hypertensive nephropathy

Answer & Comments

Answer: 2- Amyloidosis

Acute glomerulonephritis presents more acutely and anuria is a prominent feature in chronic pyelonephritis.

Kidneys are small and scarred in chronic pyelonephritis.



[Q: 1526] OnExamination 2012 - Nephrology

Which of the following is the best estimate for total body requirement of sodium per day for a 70 kg adult male?

- 1- 30 mmol
- 2- 70 mmol
- 3- 120 mmol
- 4- 160 mmol
- 5- 180 mmol

Answer & Comments

Answer: 2- 70 mmol

Understanding sodium requirements is important especially when maintenance intravenous fluid prescriptions are required.

The average sodium requirement is 60-100 mmol per day (approximately 1 mmol/kg per day).

The best answer of those listed is 70 mmol. The other options fall out of this range and should not be selected.



[Q: 1527] OnExamination 2012 - Nephrology

A 65-year-old lady is evaluated for shortness of breath.

The attending clinician is concerned about a pulmonary embolism and proceeds with a CT pulmonary angiogram.

The radiologist is concerned about the risk of contrast induced nephropathy as the patient has some degree of existing renal impairment.

At what time period does contrast induced nephropathy classically peak?

- 1- 4-8 hours
- 2- 24-48 hours
- 3- 3-5 days
- 4- 14 days
- 5- 28 days

Answer & Comments

Answer: 3- 3-5 days

Studies have shown that contrast induced nephropathy is most likely to occur 48 to 72 hours after the administration of intravenous contrast hence option C is the best answer.

The other time periods stated are less likely therefore options A, B, D and E are incorrect.

Reference:

Barrett BJ, Parfrey PS. Clinical practice. Preventing nephropathy induced by contrast medium. *N Engl J Med.* 2006 Jan 26;354(4):379-86



[Q: 1528] OnExamination 2012 -
Nephrology

A 12-year-old boy presents to the surgery with peri-orbital and mild ankle oedema which has increased over the past few weeks.

Other history of note is a recent upper respiratory tract infection. He has been feeling increasingly tired and lethargic over the past few weeks.

On examination his BP is 138/72 mmHg. He has periorbital oedema and pitting ankle oedema.

Investigations show:

Haemoglobin 12.4 g/dl(13.5-18)

White cell count $7.8 \times 10^9/L$ (4-10)

Platelets $191 \times 10^9/L$ (150-400)

Sodium 141 mmol/l (134-143)

Potassium 4.6 mmol/l (3.5-5)

Creatinine 104 $\mu\text{mol/l}$ (60-120)

Serum albumin 28 g/l (35-50)

Urine Protein ++

Which of the following is the most likely cause?

- 1- IgA nephropathy
- 2- Alport's syndrome
- 3- Membranous nephropathy
- 4- Minimal change nephropathy
- 5- Post streptococcal glomerulonephritis

Answer & Comments

Answer: 4- Minimal change nephropathy

The history of periorbital oedema, normal blood pressure and creatinine, but proteinuria and low albumin is typical of minimal change disease.

The condition is much more common in this age range than membranous nephropathy, which also causes proteinuria.

The important point about making the diagnosis is that the condition responds to corticosteroid therapy in 90% or more of sufferers in childhood within two weeks, although treatment is usually continued for a period of eight weeks.

The lack of haematuria counts against post streptococcal glomerulonephritis, and IgA nephropathy.

Alport's syndrome is a familial nephritis associated with haematuria and progressive sensorineural hearing loss.



[Q: 1529] OnExamination 2012 -
Nephrology

A 32-year-old male with type 1 diabetes undergoes a 24 hour urine collection.

Which of the following urine albumin concentrations signify microalbuminuria?

- 1- 10 mg/day
- 2- 50 mg/day
- 3- 500 mg/day
- 4- 1 g/day
- 5- 3.5 g/day

Answer & Comments

Answer: 2- 50 mg/day

Microalbuminuria is defined as a urine albumin excretion of between 30-300 mg per 24 hours.

A concentration above 300 mg/24 hours signifies albuminuria and a concentration above 3.5 g/24 hours signifies overt proteinuria.

Microalbuminuria is not just an indicator of early renal involvement but it also identifies increased cardiovascular risk with an approximate twofold cardiovascular risk above the already increased risk in the diabetic population.

A useful surrogate of the total albumin excretion is the albumin: creatinine ratio.

The urinary albumin:creatinine ratio is measured using the first morning urine sample where practicable.

Microalbuminuria is indicated where there is an albumin:creatinine ratio > 2.5 mg/mmol (men) or 3.5 mg/mmol (women).

Proteinuria is indicated by a ratio of > 30 mg/mmol.



[Q: 1530] OnExamination 2012 - Nephrology

Which one of the following cytokines is strongly implicated in renal scarring?

- 1- Interferon alpha
- 2- Interleukin-10
- 3- Granulocyte colony stimulating factor
- 4- Transforming growth factor-beta
- 5- Tumour necrosis factor alpha

Answer & Comments

Answer: 4- Transforming growth factor-beta

Renal scarring is a serious complication of chronic pyelonephritis that occurs due to vesicoureteric reflux. It is mediated by cytokines, chemokines and their receptors, complement, adhesion molecules and extracellular matrix proteins. The cytokines which seem to play the largest role are interleukin (IL)-1beta, transforming growth factor (TGF)-beta and IL-3. TGF-beta in particular seems to be pro-fibrotic by recruiting fibroblasts, and a genotype where its production is limited has been shown to be less likely to develop renal scarring.

Interferon-alpha is produced by leucocytes, and is mainly involved in innate immune responses against viral infection. It is also made synthetically as medication, used for the treatment of hepatitis C, for example.

Interleukin-10 is an anti-inflammatory cytokine which acts to inhibit the synthesis of other cytokines. It also enhances B-cell survival, proliferation and antibody production.

Granulocyte colony-stimulating factor (G-CSF) is produced by a number of different tissues to stimulate the bone marrow to produce granulocytes, and release them into the blood. It also stimulates the survival, proliferation, differentiation and function of neutrophil precursors and mature neutrophils. It is used therapeutically in patients with neutropenia secondary to chemotherapy, particularly in cases of neutropenic sepsis.

Tumour necrosis factor (TNF)-alpha is one of the cytokines that can stimulate the acute phase reaction. The majority is produced by activated macrophages, and it acts to regulate immune cells, induce fever and sepsis, initiate cell apoptosis and inhibit tumourgenesis and viral replication.



[Q: 1531] OnExamination 2012 - Nephrology

A 30-year-old Caucasian man with HIV infection was found to have high blood pressure at 180/118 mmHg (high on several occasions). His father died of stroke at the age of 51.

Routine blood tests showed:

Sodium 145 mmol/l (135-145)

Potassium 3.4 mmol/l (3.5-5.1)

Creatinine 99 µmol/l (60-110)

Urea 4.9 mmol/l (2.9-9.0)

Urinanalysis No proteinuria

Plasma aldosterone 815 pmol/l (28-445)

Plasma renin 0.3 ng/ml/h(0.7-5)

Renal ultrasound Normal-sized kidneys

CD4 769 cells/ml

HIV RNA 4531 copies/ml

He was not on any antiretroviral therapy.

What is the most likely cause of his high arterial blood pressure?

- 1- Adult polycystic kidney
- 2- Conn's syndrome
- 3- Familial essential hypertension
- 4- HIV associated nephropathy
- 5- Non-Hodgkin's lymphoma involving kidneys

Answer & Comments

Answer: 2- Conn's syndrome

High aldosterone and low renin levels indicate primary hyperaldosteronism which accounts for up to 10% of all hypertensive patients. It is the most prevalent form of secondary hypertension.

Potassium level is often normal or the lower limit of normal and so hypokalaemia is not a prerequisite for diagnosis of Conn's syndrome.

Normal renal ultrasound makes adult polycystic kidney an unlikely cause of high blood pressure.

High aldosterone and low renin level is not seen in familial essential hypertension.

HIV associated nephropathy causes proteinuria.

Non-Hodgkin's lymphoma is often associated with low CD4 count.

Reference:

Hammer F, Stewart PM. Investigating hypertension in a young person. *BMJ* 2009; 338:885-6.



[Q: 1532] OnExamination 2012 - Nephrology

A 60-year-old woman is admitted with sudden onset of chest pain and is diagnosed with an acute myocardial infarction.

Her acute illness is complicated by low blood pressure and poor tissue perfusion for several days. Her serum lactate becomes elevated.

Her serum urea and creatinine are noted to be increasing.

	Day 1	Day 2	Day 3	Normal Range
Urea (mmol/L)	8	22	30	2.5-7.5 mmol/L
Creatinine (μmol/L)	116	140	200	60-110 μmol/L

Granular and hyaline casts are present on microscopic urinalysis.

What is the renal lesion that is most likely to be present in this situation?

- 1- Acute tubular necrosis
- 2- Minimal change disease
- 3- Nodular glomerulosclerosis
- 4- Pyelonephritis
- 5- Renal vein thrombosis

Answer & Comments

Answer: 1- Acute tubular necrosis

Ischaemia, typically in hypotensive hospitalised patients, is the most frequent antecedent to acute tubular necrosis.

Blood pressure should be maintained in cardiogenic shock with fluids and / or inotropic agents.



[Q: 1533] OnExamination 2012 - Nephrology

A 32-year-old woman is assessed at the antenatal clinic; she had no known medical disease prior to this pregnancy.

Which of the following scenarios is most compatible with chronic hypertension in pregnancy?

- 1- Blood pressure 135/92 mmHg at 28 weeks of gestation
- 2- Blood pressure 142/90 mmHg at 12 weeks of gestation

- 3- Documentation of proteinuria +++ by urine dipstick at 35 weeks of gestation.
- 4- Development of pre-eclampsia at 32 weeks.
- 5- Development of pre-eclampsia at 35 weeks.

Answer & Comments

Answer: 2- Blood pressure 142/90 mmHg at 12 weeks of gestation

Chronic hypertension in pregnancy is defined as blood pressure of at least 140 mmHg systolic or 90 mmHg diastolic before pregnancy, or for women who first present for care during pregnancy as in this case, before 20 weeks of gestation (option B).

Proteinuria at the third trimester (option C), if not present initially, favours the diagnosis of pre-eclampsia, instead of end-organ damage of chronic hypertension.

Women with chronic hypertension have an increased chance of pre-eclampsia and therefore pre-eclampsia (options D and E) per se does not exclude concurrent chronic hypertension. In fact, the condition of pre-eclampsia tends to develop at less than 34 weeks of gestation with chronic hypertension, earlier than is typical in women without antecedent hypertension.

Most women with chronic hypertension have a decrease in blood pressure during pregnancy. Their blood pressure falls toward the end of the first trimester. Still, chronic hypertension has to be diagnosed by first documentation of high blood pressure before 20 weeks of gestation (option B).



[Q: 1534] OnExamination 2012 - Nephrology

A 64-year old man is admitted to the Emergency department.

A recent discharge letter lists his co-morbidities as diet controlled diabetes

mellitus, chronic renal failure, angina, hypercholesterolaemia and hypertension.

He drinks between four to six units per day and is an ex-smoker with a 20 pack year history. You note blood tests from one month ago indicating a urea of 21 mmol/l and creatinine of 600 µmol/l.

He describes a sudden onset retrosternal pain that started 12 hours previously and is sharp and pleuritic.

On examination he is distressed but haemodynamically stable with a blood pressure of 133/57 mmHg, a heart rate of 78 and oxygen saturations of 99% on air. He is hunched forward as he feels this makes the pain better. He does not have a fistula in situ.

His heart sounds are dual with no murmurs and there are fine bibasal crepitations on respiratory examination. You can not discern a raised JVP but there is mild bilateral pitting oedema to mid calf.

An ECG reveals ST elevation in all leads. A chest radiograph indicates mild pulmonary oedema with no cardiomegaly. A full blood count is normal and electrolytes reveal a of 140 mmol/l, potassium of 5.2 mmol/l, urea of 44 mmol/l and creatinine of 746 µmol/l.

What is the most appropriate management for this patient?

- 1- CT angiogram
- 2- Haemodialysis
- 3- Omeprazole and oesophagogastroduodenoscopy
- 4- Primary coronary angioplasty
- 5- Treatment dose low molecular weight heparin and CT pulmonary angiogram

Answer & Comments

Answer: 2- Haemodialysis

The most likely diagnosis in the patient is uraemic pericarditis. We do not have enough history to discern how his kidney disease is

usually managed, but in the presence of pericarditis haemodialysis is required.

Other hard indications for acute haemodialysis are hyperkalaemia, acidosis and pulmonary oedema not responding to medical treatment.

Softer indications include other uraemic symptoms and anuria without any hard indications.

A. Aortic dissection is typically a sharp pain radiating to the back. The long history and ECG changes make this diagnosis unlikely.

B. Haemodialysis is appropriate in this patient with uraemic pericarditis.

C. Omeprazole and oesophagogastroduodenoscopy would be inappropriate as there is no suggestion of upper gastrointestinal pathology.

D. Primary coronary angioplasty would not be suitable in this patient as the ECG changes of global ST segment elevation relate better to pericarditis than acute coronary syndrome.

E. The history and ECG changes fit better with pericarditis than a pulmonary embolism; therefore treatment with dose low molecular weight heparin and CTPA would be inappropriate.



[Q: 1535] OnExamination 2012 - Nephrology

You are reviewing the guidelines for GP referral to the hospital service for possible renal artery stenosis because of an increase in the number of referrals over the past few months.

Which of the following correctly reflects a criterion for a patient who should be referred for further investigations?

- 1- BP>150/90 mmHg despite 2 anti-hypertensives
- 2- Fall of GFR>10% during first 2 months after starting an ACE inhibitor

3- Fall of GFR>15% over 12 months

4- Pulmonary oedema with reduced LV function

5- Unexplained hyperkalaemia with hypertension

Answer & Comments

Answer: 3- Fall of GFR>15% over 12 months

Criteria were published in 2009 for referral for suspected renovascular disease. These did include a fall of glomerular filtration rate (GFR) greater than 15% over 12 months against a background of renovascular disease. So option C is the correct answer.

Recurrent pulmonary oedema despite normal LV function is another referral criterion.

With respect to hypertension, lack of target achievement on three or more agents is a referral criterion, as is unexplained hypokalaemia in association with raised blood pressure.

GFR criteria after starting ACE inhibitor are a fall of greater than 15% during the first two months.



[Q: 1536] OnExamination 2012 - Nephrology

A 48-year-old teacher came to the nephrology clinic; he was found to have stage 3 chronic kidney disease during a health check. He wished to discuss future renal replacement therapy.

Which of the following is/are considered to be contraindication/s to peritoneal dialysis?

1. Presence of colostomy.
2. Heparin allergy.
3. Hepatitis B infection.
4. History of complex abdominal surgery with adhesion.

1- 1 and 4

- 2- 4 only
 3- 1, 3 and 4
 4- All of above
 5- None of above

Answer & Comments

Answer: 1- 1 and 4

Heparin anticoagulation (option 2), in contrast to extracorporeal haemodialysis therapy, is not needed for peritoneal dialysis.

Peritoneal dialysis makes use of a closed system (peritoneal cavity) to allow effective dialysis. Colostomy (option 1), or any other form of peritoneal cavity breach, is a contraindication to peritoneal dialysis.

Complex abdominal surgery and resultant extensive adhesion (option 4) damage the peritoneal membrane (peritoneal fibrosis) and lead to compartments within the peritoneum. This is now considered a relative contraindication to peritoneal dialysis.

Simple abdominal surgery, however, does not preclude peritoneal dialysis; examples include cholecystectomy, appendectomy or caesarean section.



[Q: 1537] OnExamination 2012 - Nephrology

A 40-year-old woman was referred for proteinuria (2.6 gram daily). Her serum creatinine level was 120 $\mu\text{mol/L}$. The referral letter mentioned a low serum complement C3 level.

With reference to the latter information, which of the following comments are relevant to her disease?

1. A history of infective endocarditis is of relevance.
2. A detailed medical history and physical examination to search for infection focus.
3. Diagnosis of myeloma should be suspected.

4. Hepatitis B and C serology should be sought.

5. Laboratory testing should include anti-nuclear antibody (ANA) and anti-double-stranded DNA antibody.

- 1- 1 and 4
 2- 2 only
 3- 3 and 4
 4- All except 3
 5- All of above

Answer & Comments

Answer: 4- All except 3

This is a case of hypocomplementaemia glomerular disease; differential diagnosis should include

Postinfectious glomerulonephritis
 (classically infective endocarditis)

Lupus nephritis

Membranoproliferative glomerulonephritis
 and

Mixed cryoglobulinaemia.

Her proteinuria points to glomerular pathology. Glomerular diseases with low complement levels narrow down the differential diagnosis.

Membranoproliferative glomerulonephritis is classically associated with decreased serum C3 (and a normal C4, indicating activation of the alternative pathway of complement). This indicates one form of chronic immune complex disease (see above for the common examples).

On the other hand, lupus nephritis is associated with activation of the classical pathway, and often associated with suppression of both C3 and C4. This is considered a correct answer although the question did not mention the C4 level.

The median age at diagnosis of multiple myeloma (option D) is 70 years, much older than this case.

Renal impairment is unrelated to immune complex; it occurs mostly as a result of direct tubular damage from excess protein load, dehydration, hypercalcaemia, and the use of nephrotoxic medications.



[Q: 1538] OnExamination 2012 - Nephrology

A 34-year-old lady is brought into the emergency department with protracted seizures. Laboratory studies reveal that her serum sodium is 114 mmol/litre.

The attending physicians wish to treat her with 'hypertonic saline' - stronger than the normal physiologic concentration.

What is deemed to be the physiologic concentration of saline?

- 1- 0.45%
- 2- 0.9%
- 3- 1.2%
- 4- 3%
- 5- 5%

Answer & Comments

Answer: 2- 0.9%

There are few indications for hypertonic saline. Ongoing seizures secondary to hyponatraemia is one such indication.

There are a number of hypertonic saline solution concentrations above the normal physiological value of 0.9%. The question asks for the physiological saline concentration and so 0.9% is correct.

Other answers listed are not physiologic and should not be selected.

Saline at 0.45% concentration is often termed half normal saline.

The remaining options represent hypertonic saline concentrations that can be administered.



[Q: 1539] OnExamination 2012 - Nephrology

Which of the listed medications has a thiazide-like action?

- 1- Acetazolamide
- 2- Bumetanide
- 3- Furosemide
- 4- Metolazone
- 5- Triamterene

Answer & Comments

Answer: 4- Metolazone

Metolazone is an example of a diuretic with a thiazide-like action.

Bumetanide and furosemide are loop diuretics, blocking reabsorption of sodium at the loop of Henle.

Acetazolamide is a carbonic anhydrase inhibitor and has no relation to thiazide-like action.

Triamterene is a potassium-sparing diuretic with no thiazide-like activity.



[Q: 1540] OnExamination 2012 - Nephrology

Antidiuretic hormone (ADH) plays a crucial homeostatic role in osmoregulation.

From where is antidiuretic hormone released?

- 1- Adrenal medulla
- 2- Anterior pituitary
- 3- Hypothalamus
- 4- Posterior pituitary
- 5- Right atrium

Answer & Comments

Answer: 4- Posterior pituitary

Antidiuretic hormone is synthesised in the hypothalamus and stored and released from the posterior pituitary.

The other locations described are incorrect and the other options should not be selected.



[Q: 1541] OnExamination 2012 - Nephrology

Antidiuretic hormone (ADH) plays an important role in osmoregulation.

Which of the mechanisms listed most accurately describes the action of ADH on the kidney?

- 1- Carbonic anhydrase inhibition in the proximal tubule
- 2- Constriction of the efferent arteriole of the glomerular apparatus more than the afferent
- 3- Downregulation of sodium channel in the thick ascending limb of the loop of Henle
- 4- Insertion of aquaporin channels in the collecting duct of the kidney
- 5- Insertion of ATP dependent sodium channels in the distal tubule

Answer & Comments

Answer: 4- Insertion of aquaporin channels in the collecting duct of the kidney

ADH plays a crucial role in maintaining the normal concentration of the serum.

Released by the posterior pituitary, it results in insertion of aquaporin channels in the collecting duct, allowing water reabsorption. ADH does not inhibit carbonic anhydrase, nor is it related to constriction of afferent or efferent arterioles.

ADH is not associated with action on the thick ascending limb of the loop of Henle, or in the distal tubule.



[Q: 1542] OnExamination 2012 - Nephrology

A 34-year-old female presents with shortness of breath.

She has been treated for asthma by her GP with an inhaled steroid, but the GP has documented an eosinophilia of $1.1 \times 10^9/L$ (14%) (normal $<0.1 \times 10^9/L$). She has been referred to the clinic because her GP found her creatinine to be $347 \mu\text{mol/L}$ (60-110).

Which of the following would support a diagnosis of Churg-Strauss syndrome?

- 1- Extravascular eosinophils on vascular biopsy
- 2- Fixed pulmonary infiltrates on chest radiographs
- 3- Peak flow $<150\text{ml/minute}$
- 4- Peripheral alveolar filling infiltrate predominantly in the upper lobes on a chest radiograph
- 5- Peripheral 'stocking' neuropathy

Answer & Comments

Answer: 1- Extravascular eosinophils on vascular biopsy

A diagnosis of Churg-Strauss syndrome requires four of the following features:

Asthma

Eosinophilia greater than 10%

Mononeuropathy or polyneuropathy

Paranasal sinus abnormality

Non-fixed pulmonary infiltrates visible on chest radiographs and

Blood vessels with extravascular eosinophils.

Peripheral alveolar filling infiltrate predominantly in the upper lobes on a chest

radiograph is typical of chronic eosinophilic pneumonia.

A peripheral 'stocking and glove' neuropathy is not typical of Churg-Strauss syndrome and is more common in type 2 diabetes.



[Q: 1543] OnExamination 2012 - Nephrology

A 75-year-old lady with metastatic lung small cell cancer is admitted with confusion, lethargy and hyponatraemia.

The admitting clinicians think that her presentation is compatible with syndrome of inappropriate diuretic hormone (SIADH).

Which of the following medications is appropriate treatment for this?

- 1- Demeclocycline
- 2- Furosemide
- 3- Intranasal desmopressin
- 4- Intravenous 5% dextrose
- 5- Spironolactone

Answer & Comments

Answer: 1- Demeclocycline

SIADH is the excess production of antidiuretic hormone (ADH) resulting in increased water retention at the distal tubules.

Among many causes, small cell cancer is associated with ADH secretion.

Demeclocycline will block the action of ADH on the distal tubules, thereby preventing water reabsorption.

Furosemide and spironolactone are diuretics and likely to lower serum sodium.

Intranasal desmopressin is equivalent to ADH and will worsen the situation, further lowering serum sodium.

Rehydration with 5% dextrose is likely to lower serum sodium more, so this should be avoided.



[Q: 1544] OnExamination 2012 - Nephrology

Urinary protein:creatinine ratio (PCR) represents a reliable way of quantifying proteinuria.

What PCR value in mg/mmol approximates to a 24 hour urine protein collection of 1g?

- 1- 10 mg/mmol
- 2- 100 mg/mmol
- 3- 500 mg/mmol
- 4- 750 mg/mmol
- 5- 1g/mmol

Answer & Comments

Answer: 2- 100 mg/mmol

Urinary protein creatinine ratio is a spot test that has been shown to approximate 24 hour urinary protein collection reliably. It avoids the cumbersome nature of collecting urine over 24 hours.

A 24 hour urinary protein collection of 1g is approximately equivalent to urinary PCR of 100 mg/mmol. The other values are incorrect and should not be selected.



[Q: 1545] OnExamination 2012 - Nephrology

During which age range is IgA nephropathy usually diagnosed?

- 1- 10-20 years
- 2- 20-40 years
- 3- 40-60 years
- 4- 60-70 years
- 5- 70 +

Answer & Comments

Answer: 2- 20-40 years

IgA nephropathy has a male preponderance and is commonly diagnosed in the age range of 20-40.

Options A, C, D and E which fall out of this age range are incorrect and should not be selected.

Reference:

Donadio JV, Grande JP. IgA nephropathy. *N Engl J Med*. 2002 Sep 5;347(10):738-48



[Q: 1546] OnExamination 2012 - Nephrology

A 24-year-old female presents with a 48 hour history of vomiting and epigastric pain. She has vomited over ten times in the last day.

There is no history of diarrhoea and the presumed diagnosis is viral gastroenteritis.

What is the most likely picture of her acid base status?

- 1- Mixed metabolic acidosis and respiratory alkalosis
- 2- Primary metabolic acidosis
- 3- Primary metabolic alkalosis
- 4- Primary respiratory acidosis
- 5- Primary respiratory alkalosis

Answer & Comments

Answer: 3- Primary metabolic alkalosis

Copious vomiting in this patient leads to loss of gastric contents which are predominantly acidic.

The resulting acid base picture is one of a metabolic alkalosis.

Options A and B are incorrect because the patient is in acid deficit rather than acid excess.

There is no primary respiratory pathology in the question and so options D and E are incorrect.



[Q: 1547] OnExamination 2012 - Nephrology

A 62-year-old woman presents with severe nausea and lethargy a few days after beginning diclofenac and amoxicillin from her GP for pain and a urinary tract infection. She has no past history of note apart from hypertension for which she takes ramipril, and she believes she injured her back lifting a wardrobe.

On examination her BP is 159/92 mmHg, she has bilateral crackles on auscultation of the chest, her pulse is 89 and regular. Abdominal examination is unremarkable. She has a widespread erythematous rash.

Investigations show

Hb 11.9 g/dl(13.5-18)

WCC $8.9 \times 10^9/L$

Eosinophilia(4-11)

PLT $203 \times 10^9/L$ (150-400)

Na 139 mmol/l (135-146)

K 6.1 mmol/l (3.5-5)

Cr 382 mmol/l (79-118)

Urine protein ++

Blood-

White cells-

Which of the following is the most likely diagnosis?

- 1- Acute tubular necrosis
- 2- Churg-Strauss syndrome
- 3- Interstitial nephritis
- 4- Membranous nephropathy
- 5- Pyelonephritis

Answer & Comments

Answer: 3- Interstitial nephritis

The rapid onset of renal failure, coupled with a rash and eosinophilia is highly suspicious of a diagnosis of interstitial nephritis as a result of exposure to non-steroidal or amoxicillin.

Whilst eosinophilia is not usually seen in interstitial nephritis as a result of NSAIDs, it is seen in penicillin-induced interstitial nephritis.

CT scanning and ultrasound are the main imaging modalities, with IVU being rarely used now. Renal biopsy is definitive in cases where the diagnosis is in doubt.

Resolution of renal failure usually begins after the causative agent is discontinued.



[Q: 1548] OnExamination 2012 - Nephrology

A 26-year-old man is referred to the clinic with microscopic haematuria. He also has hypertension, which the GP diagnosed as essential hypertension and commenced him on amlodipine 5 mg daily.

You understand on further questioning that his brother has haematuria and renal impairment and his father died of a stroke at the age of 42. On examination his blood pressure is 152/88 mmHg, he has bilateral ballotable kidneys.

Investigations show

Haemoglobin 13.4 g/dl(13.5-18)

White cell count $6.0 \times 10^9/L$ (4-10)

Platelets $242 \times 10^9/L$ (150-400)

Sodium 140 mmol/l (134-143)

Potassium 4.7 mmol/l (3.5-5)

Creatinine 162 μ mol/l (60-120)

Urine blood ++

Protein -

Which of the following is the investigation most appropriate to elucidate the underlying diagnosis?

1- Contrast CT abdomen

2- Cystoscopy

3- Intravenous pyelogram (IVP)

4- Plain abdominal film

5- Ultrasound abdomen

Answer & Comments

Answer: 5- Ultrasound abdomen

The fact that his father and brother are both affected is suggestive of an autosomal dominant inherited disorder, probably autosomal dominant polycystic kidney disease (ADPKD).

Given that his father had a stroke at a young age, this raises the possibility of a berry aneurysm and subsequent subarachnoid haemorrhage.

ADPKD affects as many as 1 in 1000 individuals and is responsible for around 10% of the UK dialysis burden.

Polycystic liver disease is seen in 80% of patients but is usually asymptomatic. Abdominal ultrasound has a sensitivity approaching 100% for patients above 20 years of age.

Hypertension should be aggressively managed, with ACE inhibitors the therapy of choice.



[Q: 1549] OnExamination 2012 - Nephrology

A 54-year-old man with intermittent claudication was found to have renal impairment.

Investigations revealed:

Serum Creatinine 180 μ mol/l (60-100)

Urinalysis Protein++

Renal ultrasound revealed a right kidney of 7 cm and a left kidney of 10 cm (normal dimensions 10-14 cm).

Which investigation should be requested to establish a diagnosis?

- 1- Cystoscopy
- 2- Intravenous urography
- 3- Isotope renography
- 4- Renal arteriography
- 5- Renal biopsy

Answer & Comments

Answer: 4- Renal arteriography

This patient has renovascular disease with a right renal artery stenosis.

The gold standard for establishing a diagnosis of renal artery stenosis is renal arteriography and this is commonly performed with magnetic resonance angiography.

In one third of cases the disease is bilateral; 40% may have peripheral vascular disease and there may be proteinuria.



[Q: 1550] OnExamination 2012 - Nephrology

A 7-year-old boy is admitted with renal colic due to renal calculus.

His mother has a similar history of recurrent calculi.

What is the most likely explanation for recurrent renal calculi in both mother and child?

- 1- Cystinosis
- 2- Cystinuria
- 3- Hyperoxaluria
- 4- Idiopathic hypercalciuria
- 5- Urate uropathy

Answer & Comments

Answer: 4- Idiopathic hypercalciuria

Idiopathic hypercalciuria has a familial or sporadic pattern. In the familial pattern an autosomal dominant inheritance is present.

The type of the disease is identical in affected members of the same family and the typical presentation is of recurrent urinary calculi.

Cystinuria, cystinosis, urate uropathy and hyperoxaluria are autosomal recessive conditions.



[Q: 1551] OnExamination 2012 - Nephrology

A 30-year-old female presents with fevers and a three month history of malaise.

Results show:

Creatinine 250 $\mu\text{mol/L}$ (60-110)

Complement C3 23 mg/dL (65-190)

What is the likely diagnosis?

- 1- HIV nephropathy
- 2- Infective endocarditis
- 3- Membranous nephropathy
- 4- Microscopic polyangiitis
- 5- Minimal change nephropathy

Answer & Comments

Answer: 2- Infective endocarditis

Hypocomplementaemia is associated with either vasculitides such as systemic lupus erythematosus and cryoglobulinaemia but is also associated with a non-vasculitic process such as subacute bacterial endocarditis (SBE).

In this case with the three month history and fevers SBE is suggested.

In microscopic polyangiitis, which is classically small vessel, complement would be expected to be normal.



[Q: 1552] OnExamination 2012 -
Nephrology

A 43-year-old male is diagnosed with diabetic nephropathy. If this patient had type 1 diabetes his chances of progressing to end stage renal disease (ESRD) would be approximately 50%.

What percentage of patients with type 2 diabetes with diabetic nephropathy would be expected to progress to ESRD?

- 1- 15%
- 2- 30%
- 3- 45%
- 4- 50%
- 5- 55%

Answer & Comments

Answer: 1- 15%

Although the incidence of diabetic nephropathy is less in type 2 diabetics as approximately 90-95% of all diabetics are type 2s, the majority of patients with diabetic nephropathy are type 2 diabetics.

There are a number of stages in the development of nephropathy with glomerular hyperfiltration being an early feature. Nephropathy itself is signalled by the excretion of trace amounts of protein in the urine microalbuminuria.

The progression of the disease may be attenuated by stringent blood pressure control (with an angiotensin-converting enzyme inhibitor [ACEi]) and strict glycaemic control.



[Q: 1553] OnExamination 2012 -
Nephrology

A 17-year-old girl is admitted with a two day history of rigors due to a urinary tract infection.

On examination she appears unwell, has a body mass index (BMI) of 31 kg/m², a temperature of 39°C; examination is otherwise normal.

Initial biochemistry revealed:

Potassium 4 mmol/L(3.5-4.9)

Urea 7 mmol/L(2.5-7.5)

Glucose 33 mmol/L(3.0-6.0)

pH 7.3 (7.36-7.44)

Standard bicarbonate 14 mmol/L(20-28)

Base deficit -10 mmol/L

urinalysis negative for ketones

Which one of the following is the best initial treatment for her hyperglycaemia?

- 1- Metformin
- 2- Metformin plus gliclazide
- 3- Pioglitazone
- 4- Sliding scale IV insulin infusion
- 5- Subcutaneous insulin mixture

Answer & Comments

Answer: 4- Sliding scale IV insulin infusion

This patient has a metabolic acidosis with pH of 7.3 and low bicarbonate, this is most likely due to sepsis.

She is likely to have type 2 diabetes given the BMI with uncontrolled hyperglycaemia but is unlikely to have classical diabetic ketoacidosis because the urine is negative for ketones.

It is important that her glycaemia is controlled to promote recovery from the sepsis.

This is best achieved with intravenous insulin initially.



[Q: 1554] OnExamination 2012 -
Nephrology

A 25-year-old female wishes to start a family but she is concerned as her 50-year-old mother had adult polycystic kidney disease.

Examination reveals no specific abnormalities.

Which is the most appropriate initial screening test for polycystic kidney disease in this woman?

- 1- Genetic linkage analysis
- 2- Intravenous urogram
- 3- Isotope renography
- 4- Renal ultrasound
- 5- Urinalysis

Answer & Comments

Answer: 4- Renal ultrasound

The answer lies between renal ultrasound and genetic linkage analysis. Polycystic kidney disease is an autosomal dominant disorder. Mutations in at least three different genes can lead to autosomal dominant polycystic disease (APKD).

PKD-1 on chromosome 16: 85% of cases. Polycystin 1 is an integral membrane glycoprotein involved in cell/matrix interactions

PKD-2 on chromosome 4: 10% of cases. Polycystin 2 which may associate with polycystin 1 through a common signalling pathway

A third gene mutation is known but its exact chromosomal location is not.

Diagnosis is made by multiple bilateral renal cysts and a positive family history.

Genetic linkage studies: Can exclude or make the diagnosis in younger patients. Requires blood from at least two affected family members.

Ultrasonography:

In PKD 1 families, age related diagnostic criteria are used: two cysts in under 30 years age group.

At least two cysts in each kidney in 30-59 years. Four cysts in each kidney for over 60 years.

CT: More sensitive than USS and may aid in diagnosis in younger patients.

MR angiography: In patients with a family history of intracranial aneurysm - to screen for cerebral aneurysms.



[Q: 1555] OnExamination 2012 - Nephrology

You are called to the Emergency department to assess a 21-year-old student who has presented with bloody diarrhoea.

The diarrhoea started two weeks previously and was associated with increasing nausea and malaise and mild swelling of the lower limbs. She was having difficulty passing urine. She had eaten steak from the local butcher at a friend's barbeque the day before developing diarrhoea.

On examination she was pale with evidence of petechiae over her legs. Her face appeared puffy. Blood pressure was 160/95 mmHg. She was afebrile but had a tachycardia and crackles on inspiration at both lung bases. There was an old appendectomy scar in the right iliac fossa.

Investigations showed:

Haemoglobin 8.5 g/dl(11.5-16.5)

White cell count $13.2 \times 10^9/L$ (4-11)

Neutrophils $9.5 \times 10^9/L$ (1.5-7)

Platelets $35 \times 10^9/L$ (150-400)

PT 12s(11.5-15.5)

APTT 34 s(30-40)

Fibrinogen 4 g/l (1.8-5.4)

Serum Sodium 139 mmol/l (137-144)

Serum potassium 6.1 mmol/l (3.5-4.9)

Serum urea 40 mmol/l (2.5-7.5)

Serum creatinine 411 $\mu\text{mol/l}$ (60-110)

Serum albumin 27 g/l (37-49)

Dipstick urine Blood ++ Protein +

What is the single most important next investigation to determine the diagnosis?

- 1- ASO titres
- 2- Blood film analysis
- 3- Renal tract ultrasound
- 4- Transthoracic echocardiogram
- 5- Urine microscopy

Answer & Comments

Answer: 2- Blood film analysis

This patient has haemolytic uraemic syndrome (HUS).

It typically presents with a triad of:

- Acute renal failure (ARF)
- Microangiopathic haemolytic anaemia
- Thrombocytopenia with normal clotting.

HUS is a complication of infection with verocytotoxin producing *Escherichia coli* usually of the serotype 0157:H7.

Toxins produced in the intestine enter the blood and bind to endothelial cells in target organs. Endothelial cell damage leads to platelet and fibrin deposition with resultant fragmentation of circulating red blood cells and microvascular occlusion.

The syndrome has also been reported after infections with coxsackie, echovirus and Shigella.

HUS is characterised by the sudden onset of haemolytic anaemia with fragmentation of red blood cells, thrombocytopenia and acute renal failure after a prodromal illness of acute gastroenteritis often with bloody diarrhoea.

Clinical signs include increasing pallor, haematuria, oliguria and purpura. Jaundice is occasionally seen. Hypertension may be present.

Typical results show an anaemia, thrombocytopenia, and often a neutrophilia. Blood film shows fragmented erythrocytes.

Urea and electrolytes are typical of acute renal failure. There is normal coagulation and fibrinogen.

Neurological complications include:

Stroke, seizure and coma occur in 25% of patients

Rarely pancreatitis

Pleural and pericardial effusions.

Approximately 5% of patients will develop end stage renal failure.

Long term renal sequelae range from proteinuria to chronic renal failure.

Therapy is supportive with:

- Correction of anaemia
- Correction of uraemia by early dialysis
- Strict fluid balance
- Treatment of hypertension.

Major differential diagnosis is:

Sepsis with DIC - presents with abnormalities of clotting parameters.

TTP - thrombotic thrombocytopenic purpura presents with microangiopathic haemolytic anaemia, thrombocytopenic purpura, neurologic abnormalities, fever, and renal disease.

Renal abnormalities tend to be more severe in HUS.

Although once considered variants of a single syndrome, recent evidence suggests that the pathogenesis of TTP and HUS is different. Patients with TTP lack a plasma protease that is responsible for the breakdown of von Willebrand factor (vWF) multimers and these accumulate in the plasma. The activity of this protease is normal in patients with HUS.

Until the test for vWF protease activity becomes available, differentiation between HUS and TTP is based on the presence of central nervous system involvement in TTP and the more severe renal involvement in HUS.

In HUS 90% of patients are children and a history of prodromal diarrhoeal illness is more common.

The therapy of choice for TTP is plasma exchange with fresh frozen plasma.



[Q: 1556] OnExamination 2012 - Nephrology

A 23-year-old female presents at 16 weeks into her first pregnancy with a blood pressure of 144/96 mmHg. A 24 hour urine collection reveals a protein excretion of 0.7 g/d (<0.2)

What is the most likely explanation for these findings?

- 1- Essential hypertension
- 2- Gestational hypertension
- 3- Normal changes of pregnancy
- 4- Pre-eclampsia
- 5- Secondary hypertension

Answer & Comments

Answer: 5- Secondary hypertension

This pregnant woman has hypertension and proteinuria (as defined by a blood pressure above 140/90 mmHg and proteinuria above 0.3 g/d). It would not be regarded as normal to have this high a blood pressure or protein content of urine.

Hypertensive disorders during pregnancy occur in women with pre-existing primary or secondary hypertension, and in women who develop new-onset hypertension (defined as those cases occurring after 20 weeks).

All patients who have hypertension during pregnancy are at increased risk of eclampsia.

Although the rate of this is decreasing, hypertension in pregnancy remains one of the leading causes of maternal death. In addition it can lead to stillbirth, preterm birth and small for gestational age babies.

In pregnancy chronic hypertension is defined as hypertension that is present at the booking visit or before 20 weeks, or if the woman is already taking antihypertensive medication when she conceives. It can be primary or secondary in aetiology.

Gestational hypertension is new hypertension which presents after 20 weeks without significant proteinuria.

Pre-eclampsia is new hypertension presenting after 20 weeks with significant proteinuria. Severe pre-eclampsia is pre-eclampsia with severe hypertension (>160/110) and/or with symptoms (headache, visual disturbance, abdominal pain, vomiting, breathlessness and oedema), and/or biochemical and haematological impairment.

The presence of significant proteinuria in chronic hypertension should alert you to the suspect underlying renal disease, especially in a young patient. Significant proteinuria is defined as a urinary protein:creatinine ratio greater than 30mg/mmol or a 24-hour urine collection or more than 300mg protein. In pregnancy it only indicates pre-eclampsia if it develops after 20 weeks gestation.

Management of chronic hypertension in pregnancy involves determining the cause (if you suspect it to be secondary), restricting dietary sodium, regular antenatal check-ups, and anti-hypertensive treatment. Blood pressure should be kept less than 150/100mmHg, unless there is evidence of target-organ damage in which case the blood pressure should be kept less than 140/90mmHg.

Patients with chronic hypertension are at increased risk of developing pre-eclampsia and are therefore prescribed 75mg of aspirin

daily from 12 weeks, which is believed to reduce the risk. ACE inhibitors and angiotensin-II receptor blockers are avoided due to their increased risk of congenital malformations. In general treatment should be overseen by an obstetrician if there is primary hypertension, and a renal physician or endocrinologist if secondary hypertension is suspected.



[Q: 1557] OnExamination 2012 - Nephrology

A 72-year-old male presented to his GP with depression after the death of his wife.

His notes also reveal that he has a two year history of urinary hesitancy and poor stream. His GP prescribed him some medication and the following day he developed acute urinary retention.

Which of the following drugs is most likely to have precipitated the urinary retention?

- 1- Amitriptyline
- 2- Diazepam
- 3- Fluoxetine
- 4- Venlafaxine
- 5- Zopiclone

Answer & Comments

Answer: 1- Amitriptyline

Amitriptyline has anticholinergic effects, being associated with tachycardia, dry mouth and urinary retention.

These features are not typical of selective serotonin reuptake inhibitors (SSRIs) such as venlafaxine and fluoxetine, with urinary retention and dry mouth rarely reported.

Diazepam, a benzodiazepine does not have anticholinergic effects.

Zopiclone is a benzodiazepine-like agent whose side effects include drowsiness.



[Q: 1558] OnExamination 2012 - Nephrology

A 45-year-old man had recurrent nephrolithiasis.

Renal function tests and serum calcium measurements were normal.

A 24 hour urine collection revealed:

Volume 3L

Calcium 15 mmol/24 hours (2.5-7.5)

Oxalate 200 mmol/24 hours (90-450)

Uric acid 3 mmol/24 hours (1.48-4.45)

Citrate 2mmol/24hours (0.3-3.4)

What is the most useful therapy to reduce stone formation?

- 1- Allopurinol
- 2- Dietary calcium restriction
- 3- Penicillamine
- 4- Potassium citrate
- 5- Thiazide diuretic

Answer & Comments

Answer: 5- Thiazide diuretic

This patient has hypercalciuria and thiazide diuretics can decrease urinary excretion of calcium and possibly oxalate.

Dietary calcium restriction will not limit calciuria, given the large amount of calcium that can be mobilised from bone.

The lack of hyperuricosuria and hypocitraturia excludes the other treatments offered.



[Q: 1559] OnExamination 2012 - Nephrology

A 30-year-old woman presented with hypertension (160/110 mmHg), elevated titres of antibodies to double-stranded DNA, and proteinuria (1g per 24 hours).

A renal biopsy demonstrated WHO class II lupus nephritis (mesangial disease).

What is the most appropriate single treatment for this patient?

- 1- Antihypertensive medication
- 2- High-dose corticosteroids
- 3- Intravenous cyclophosphamide
- 4- Oral cyclophosphamide
- 5- Plasma exchange

Answer & Comments

Answer: 1- Antihypertensive medication

There is good evidence that immunosuppression could alter outcome in the presence of proliferative glomerulonephritis but not in mesangial or membranous glomerulonephritis.

Therefore the best line of treatment would be a conservative approach to address risk factors for progression of renal impairment such as uncontrolled hypertension.

There is no good evidence to support plasma exchange as an effective treatment modality in lupus nephritis.



[Q: 1560] OnExamination 2012 - Nephrology

A 66-year-old man has developed chronic renal failure with a serum urea of 60 mmol/l (2.5-7.5) and creatinine of 650 mol/l (60-110).

Auscultation of the chest reveals a friction rub over the cardiac apex.

Which of the following types of pericarditis is he likely to have?

- 1- Constrictive
- 2- Fibrinous
- 3- Haemorrhagic
- 4- Purulent
- 5- Serous

Answer & Comments

Answer: 2- Fibrinous

The uraemia leads to exudation of fibrin onto the epicardial and pericardial surfaces.

Haemorrhagic pericarditis is more typical of tuberculosis or metastatic tumour.

Serous pericarditis is more typical of collagen vascular diseases.



[Q: 1561] OnExamination 2012 - Nephrology

Which of the following statements regarding idiopathic membranous nephropathy is correct?

- 1- Immune complex deposits are typically seen in the glomerular mesangium.
- 2- It characteristically presents in the first decade of life.
- 3- Males are twice as commonly affected as females.
- 4- Progression to end-stage renal failure is rapid.
- 5- The nephritic syndrome is a characteristic presentation.

Answer & Comments

Answer: 3- Males are twice as commonly affected as females.

Membranous nephropathy is characterised by thickened basement membranes and monotonous granular deposits of IgG and C3 distributed in the epimembranous space of virtually all glomerular capillaries.

The mesangium may be involved at a later stage of the disease and is more typical of secondary disease.

It is typically seen in the over 40 age group with a male predominance of 2 to 1 and is associated with a variable prognosis with 25% developing end stage renal failure (ESRF) over

10 years and 25% going into remission. There is a higher rate of remission for the idiopathic form.

The majority of patients manifest with a pure nephrotic syndrome.

A nephritic presentation is rare.



[Q: 1562] OnExamination 2012 - Nephrology

Which of the following concerning renal blood flow is true?

- 1- Can be measured using the Fick principle
- 2- Is decreased in response to hypoxia
- 3- Is 40% of the cardiac output at rest
- 4- Is higher in the medulla than the cortex
- 5- Is increased when renal nerves are stimulated

Answer & Comments

Answer: 1- Can be measured using the Fick principle

Renal blood flow (RBF) is approximately 25% of cardiac output.

The 'Fick principle' can be used to estimate RBF through clearance.

RBF is higher in the cortex than medulla as one might expect with the increasing glomeruli in this region.

Sympathetic stimuli produce vasoconstriction and RBF should be increased in response to hypoxia.



[Q: 1563] OnExamination 2012 - Nephrology

A 70-year-old female is admitted 12 hours after taking an overdose of aspirin.

Investigations revealed:

Serum Sodium 138 mmol/l (137-144)

Serum Potassium 5.9 mmol/l (3.5-4.9)

Serum bicarbonate 14 mmol/l (20-28)

Serum Urea 18.1 mmol/l (2.5-7.5)

Serum Creatinine 238 mol/l (60-110)

Serum salicylate 1120 mg/l (8)

What is the most appropriate treatment of this patient?

- 1- Haemodialysis
- 2- Haemofiltration
- 3- Intravenous sodium bicarbonate
- 4- Peritoneal dialysis
- 5- Urine alkalinisation

Answer & Comments

Answer: 1- Haemodialysis

This patient is at major risk of aspirin toxicity as reflected by the excessive aspirin concentration and appears to have developed acute renal failure - she is acidotic with an elevated potassium.

Bicarbonate is recommended as a supportive therapy but in this patient haemodialysis is the treatment of choice. The latter is advised when the plasma-salicylate concentration is greater than 700 mg/litre (5.1 mmol/litre) or in the presence of severe metabolic acidosis as recommended within the BNF poisons section.

There is nothing wrong with haemofiltration it just removes the toxin more slowly.



[Q: 1564] OnExamination 2012 - Nephrology

Which one of the following statements is correct?

- 1- Adult polycystic renal disease is inherited as an autosomal recessive trait
- 2- Alport's syndrome affects females more severely than males
- 3- Medullary sponge kidney is typically not inherited but is a congenital condition.

- 4- Nephrogenic diabetes insipidus (DI) is inherited as an autosomal dominant trait
- 5- Reflux nephropathy is inherited as an autosomal recessive trait

Answer & Comments

Answer: 3- Medullary sponge kidney is typically not inherited but is a congenital condition.

Polycystic kidney disease (PKD) is usually autosomal dominant although the infantile form is autosomal recessive.

Nephrogenic DI is usually X linked.

Features of Alport's syndrome (hereditary nephritis, haematuria, progressive renal failure and high frequency nerve deafness) are usually more marked in males.

Neither reflux nephropathy nor medullary sponge kidneys are hereditary conditions.



[Q: 1565] OnExamination 2012 - Nephrology

What is the most likely outcome of minimal change nephropathy with onset at 12 years of age?

- 1- Frequent relapse
- 2- Full renal recovery
- 3- Permanent renal impairment
- 4- Persistent hypertension
- 5- Persistent proteinuria

Answer & Comments

Answer: 2- Full renal recovery

Thirty to 40% of children achieve spontaneous remission and 90% achieve remission following eight weeks of treatment with high dose steroids.

However in adults only around 50% achieve remission.



[Q: 1566] OnExamination 2012 - Nephrology

A 30-year-old man had a blood pressure of 150/100 mmHg.

Clinical examination was normal.

Which one of the following would suggest secondary hypertension?

- 1- 24 Hour urinary protein excretion of 1.6 g (<0.2)
- 2- A creatinine clearance of 90 mL/min (70-140)
- 3- Left ventricular hypertrophy (LVH) criteria on the ECG
- 4- Serum potassium of 3.9 mmol/L (3.5-4.9)
- 5- The presence of arteriovenous (AV) nipping on fundoscopy.

Answer & Comments

Answer: 1- 24 Hour urinary protein excretion of 1.6 g (<0.2)

It is rather young for a 30-year-old to be hypertensive but the presence of such a degree of urinary protein would suggest that the lesion is of renal origin - polyarteritis nodosa, etc.

The potassium concentration is normal and although it does not exclude Conn's it is certainly not suggestive.

LVH would be found with sustained hypertension of any aetiology as would AV nipping.

The creatinine clearance is normal.



[Q: 1567] OnExamination 2012 - Nephrology

A 69-year-old man developed spontaneous bacterial peritonitis complicating his Child's C liver cirrhosis. There was no sign of hypovolaemia.

Which of the following measures was best supported by evidence to prevent the development of hepatorenal syndrome?

- 1- Intravenous dopamine infusion
- 2- Intravenous albumin administration.
- 3- Central venous pressure monitoring
- 4- Regular lactulose use
- 5- Neomycin

Answer & Comments

Answer: 2- Intravenous albumin administration.

Administration of albumin (1.5 g per kilogram of body weight at diagnosis and 1.0 g per kilogram 48 hours later), in addition to antibiotics, has been shown in randomised controlled trial to markedly reduce the risk of hepatorenal syndrome (option B).

The mechanism of albumin (option B) is thought to be its positive effect on circulatory function and other effects, such as antioxidant properties.

Judicious use of diuretics prevents renal failure but this patient has no sign of hypovolaemia.

Central venous pressure monitoring (option C) is not indicated.

Synthetic disaccharide lactulose (option D) is for preventing hepatic encephalopathy, and has no role in preventing hepatorenal syndrome.

Neomycin (option E), by the same token, is thought to be a treatment of choice for hepatic encephalopathy (but limited evidence). In fact, it has been associated with ototoxicity and nephrotoxicity (hence incorrect for option E).



[Q: 1568] OnExamination 2012 - Nephrology

A 67-year-old man presents with sudden

onset atrial fibrillation (ventricular rate of 150/minute). His serum creatinine concentration was 250 $\mu\text{mol/L}$ (70-110).

What is the main factor that determines the choice of loading dose of digoxin in this patient?

- 1- Absorption
- 2- Apparent volume of distribution
- 3- Lipid solubility
- 4- Plasma half life
- 5- Renal clearance

Answer & Comments

Answer: 5- Renal clearance

The pharmacokinetics of digoxin are complex and best explained by a two compartment model.

The loading dose is mainly dependent on the volume of distribution of a drug but this patient has moderate renal failure.

The loading dose is calculated (using various models) by taking into account age, creatinine clearance, body surface area, etc.

Volume of distribution becomes important particularly when body weight is 40 kg or less.

On balance it is the renal failure that is the most important factor in this patient in determining the loading dose.

Digoxin is cleared by the kidneys so the maintenance dose would require adjustment in renal failure.



[Q: 1569] OnExamination 2012 - Nephrology

A 69-year-old man developed *Pseudomonas aeruginosa* infection.

He was started on gentamicin.

Aminoglycoside nephrotoxicity correlates with which one of the following?

- 1- Frequency of aminoglycoside dosing
- 2- High peak and low trough aminoglycoside levels
- 3- Ototoxicity
- 4- Post-antibiotic effect
- 5- Supratherapeutic doses administered once daily

Answer & Comments

Answer: 1- Frequency of aminoglycoside dosing

Aminoglycoside undergoes glomerular filtration and then reabsorption in the proximal tubule where tubular cell injury/death occurs.

Administering aminoglycoside less frequently (option A) allows the kidney more time to "recover" from drug accumulation within the proximal tubular cells and hence minimises nephrotoxicity.

Although aminoglycoside toxicity is not that common, over the past years an experimental animal model has provided insights regarding the mechanisms of cytotoxicity.

Aminoglycoside toxicity occurs in those cell types in which the drug accumulates - primarily the proximal tubules in the cortex.

Multiple human clinical trials (including meta-analysis) as well as animal studies report less nephrotoxicity and equal efficacy when aminoglycosides are given once daily (option E supratherapeutic doses) rather than in conventional divided doses.

This once-daily dosing approach exploits the post-antibiotic bactericidal effect even when drug levels fall below the so-called "therapeutic levels" allowing for a longer dosing interval (thus high peaks and low troughs are desirable, making options B and D incorrect).

Ototoxicity probably has a different underlying pathophysiology from that of nephrotoxicity; the two do not predict one another (option C).



[Q: 1570] OnExamination 2012 - Nephrology

A 59-year-old man with chronic renal failure comes to the surgery complaining of tiredness and lethargy. He has a longstanding history of type 1 diabetes and takes a range of medications.

On examination his BP is 145/84 mmHg.

Investigations show

Haemoglobin 9.4 g/dl (13.5-18)

White cell count $6.4 \times 10^9/L$ (4-10)

Platelets $162 \times 10^9/L$ (150-400)

Sodium 140 mmol/l (134-143)

Potassium 5.0 mmol/l (3.5-5)

Creatinine 219 $\mu\text{mol/l}$ (60-120)

Ferritin 10 Microgram/l (20-60)

Faecal occult blood Negative

Urine Protein ++

Which of the following is the most appropriate next step?

- 1- Erythropoietin
- 2- IV iron transfusion
- 3- Oral ferrous sulphate
- 4- Referral for lower GI endoscopy
- 5- Referral for upper GI endoscopy

Answer & Comments

Answer: 2- IV iron transfusion

This patient has a low serum ferritin, a common occurrence in patients with chronic renal failure. Often patients with chronic renal failure struggle with their eating, and have deficient iron absorption. As such IV iron transfusion is the therapy of choice.

Once iron stores are restored and ferritin is in the normal range, if the patient is still anaemic then erythropoietin would be the next appropriate option.

Given the FOB is negative, GI blood loss is less likely as a cause of his anaemia.



[Q: 1571] OnExamination 2012 - Nephrology

A 63-year-old man, with chronic renal failure and type 2 diabetes, presents to the surgery complaining of generalised aching. He takes twice daily mixed insulin for his diabetes, and ramipril for vascular risk modification.

On examination his BP is 155/92 mmHg, pulse is 75 and regular. Physical examination is otherwise unremarkable.

Haemoglobin 10.9 g/dl(13.5-18)

White cell count $6.1 \times 10^9/L$ (4-10)

Platelets $191 \times 10^9/L$ (150-400)

Sodium 140 mmol/l (134-143)

Potassium 5.3 mmol/l (3.5-5)

Creatinine 320 $\mu\text{mol/l}$ (60-120)

Calcium 2.05 Mmol/l (2.2-2.67)

Urine Protein +

Which of the following is the most likely underlying diagnosis?

- 1- Hypoparathyroidism
- 2- Primary hyperparathyroidism
- 3- Secondary hyperparathyroidism
- 4- Tertiary hyperparathyroidism
- 5- Vitamin D intoxication

Answer & Comments

Answer: 3- Secondary hyperparathyroidism

Chronic renal failure leads to low levels of hydroxylated vitamin D, and hence to hypocalcaemia. This leads to a secondary increase in parathyroid hormone levels.

The second, fourth and fifth options will cause hypercalcaemia.

Standard therapy of choice is three times per week 1-alpha calcidol. Once the calcium approaches the normal range there is often an associated fall in parathyroid levels.

Cinacalcet may be used in patients with end-stage renal disease receiving maintenance haemodialysis, with frequent monitoring of parathormone and calcium.



[Q: 1572] OnExamination 2012 - Nephrology

A 28-year-old man is referred to you by the practice nurse for hypertension management. She has seen him three times over the past four months and his BP is persistently elevated at around 155/92 mmHg.

Your partner has seen him previously for some non-specific right upper quadrant abdominal pain.

On examination of the abdomen you can feel bilateral enlarged kidneys, and a liver edge.

Investigations show

Haemoglobin 12.5 g/dl(13.5-18)

White cell count $6.4 \times 10^9/L$ (4-10)

Platelets $182 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (134-143)

Potassium 4.8 mmol/l (3.5-5)

Creatinine 182 $\mu\text{mol/l}$ (60-120)

Glucose 4.5 Mmol/l (<6.0)

Urine Blood ++

Protein -

Which one of the following is most closely associated with his underlying condition?

- 1- Aortic stenosis
- 2- Coarctation of the aorta
- 3- Diabetes mellitus
- 4- Mitral valve prolapse

5- Tricuspid stenosis

Answer & Comments

Answer: 4- Mitral valve prolapse

A young man presenting with renal failure, haematuria and liver and renal masses raises the suspicion of polycystic kidney disease.

Associated liver cysts are found in around 80% of individuals with polycystic kidney disease. Pancreatic cysts are rarer, and may in some cases be associated with recurrent pancreatitis.

Patients are at increased risk of renal stones, but the predominant increase is seen in urate stones, rather than other types.

Up to 25% of patients may have some degree of mitral valve prolapse.

MODY 5 is associated with hepatic and renal cysts and diabetes mellitus, but that is less likely to be the diagnosis here in the presence of a normal glucose.

Polycystic kidney disease carries an autosomal dominant pattern of inheritance, but may occur as a de novo mutation in 5%.



[Q: 1573] OnExamination 2012 - Nephrology

A 35-year-old man presents with left loin pain and haematuria. He comments that he has had three episodes of similar symptoms in the past.

On examination, he is afebrile and has mild pallor.

Investigations show:

Sodium 140 mmol/L (137-144)

Potassium 3.0 mmol/L (3.5-4.9)

Chloride 115 mmol/L (95-107)

Bicarbonate 12 mmol/L (20-28)

Calcium 2.5 mmol/L (2.2-2.6)

Urea 19 mmol/L (2.5-7.5)

Urinalysis pH 6.5, protein 1+, RBC 1+, White cell count 1+

What is the most likely diagnosis?

1- Bartter's syndrome

2- Conn's syndrome

3- Renal tubular acidosis type 1

4- Renal tubular acidosis type 2

5- Renal tubular acidosis type 4

Answer & Comments

Answer: 3- Renal tubular acidosis type 1

The patient has metabolic acidosis with failure to acidify the urine appropriately, pointing to a diagnosis of renal tubular acidosis (RTA).

Type 1 RTA is due to distal tubule defect to excrete hydrogen ions whereas type 2 RTA is associated with proximal tubule defect to reabsorb bicarbonate.

Type 1 is associated with nephrocalcinosis.

Both types 1 and 2 are associated with hypokalaemia whereas type 4 is characterised by hyperkalaemia.

Bartter's and Conn's syndromes are causes of hypokalaemia and metabolic alkalosis.



[Q: 1574] OnExamination 2012 - Nephrology

A 70-year-old man underwent emergency surgery for an acute abdomen.

Following surgery he was noted to have become oliguric.

Investigations revealed the following:

Sodium 121 mmol/l (137-144)

Potassium 6.6 mmol/l (3.5-4.9)

Chloride 92 mmol/l (95-107)

Urea 17.2 mmol/l (2.5-7.5)

Creatinine 250 µmol/l (60-110)

pH 7.16 (7.36-7.44)

Standard bicarbonate 15.6 mmol/l (20-28)

What is the calculated anion gap for this patient?

- 1- 5 mmol/l
- 2- 10 mmol/l
- 3- 15 mmol/l
- 4- 20 mmol/l
- 5- 25 mmol/l

Answer & Comments

Answer: 4- 20 mmol/l

Anion gap is calculated as $(Na + K) - (Cl + HCO_3)$.

Therefore in this patient, the calculated value is 20 mmol/l.

The normal anion gap is between 8-16 mmol/l. The excessive value here reflects the presence of other acidic anions, and in this case with the metabolic acidosis, the constituents may be lactate, etc.



[Q: 1575] OnExamination 2012 - Nephrology

A 55-year-old man who has received haemodialysis for many years presents with deteriorating discomfort in both shoulders. Past medical history included bilateral carpal tunnel decompression.

His investigations reveal:

Haemoglobin 10 g/dl (13.0-18.0)

ESR 30 mm/1st hr (1-10)

C reactive protein 12 mg/l (<10)

Urate 0.58 mmol/l (<0.45)

What is the most likely diagnosis?

- 1- β_2 microglobulin amyloidosis
- 2- Gout
- 3- Osteoarthritis
- 4- Polymyalgia rheumatica

5- Pseudogout

Answer & Comments

Answer: 1- β_2 microglobulin amyloidosis

The features of shoulder pain associated with a past history of carpal tunnel syndrome in a patient receiving haemodialysis suggests a diagnosis of β_2 microglobulin amyloidosis.

Amyloid deposits composed of β_2 microglobulin as the major constituent protein are mainly localised in joints and periarticular bone and lead to destructive arthropathy which tends to develop five to ten years after the initiation of dialysis.

Death from amyloidosis of gut and heart may occur after 20 years of dialysis.



[Q: 1576] OnExamination 2012 - Nephrology

A 50-year-old man is admitted with cardiogenic shock due to an acute myocardial infarction.

His urine output drops over the next few days. His serum urea increases to 18 mmol/l (2.5 - 7.5), with creatinine of 300 μ mol/l (60 - 110). Urinalysis reveals no protein or glucose, a trace blood, and numerous hyaline casts.

Several days later he develops polyuria and his serum urea and creatinine fall.

Which of the following pathologic findings is most likely to be seen in his kidneys?

- 1- Fusion of podocyte foot processes
- 2- Glomerular crescents
- 3- Hyperplastic arteriolosclerosis
- 4- Mesangial immune complex deposition
- 5- Patchy tubular necrosis

Answer & Comments

Answer: 5- Patchy tubular necrosis

He would have findings of ischaemic acute tubular necrosis from cardiogenic shock.

Fusion of podocyte foot processes is seen in minimal change glomerulonephritis.

Glomerular crescents can complicate any glomerulopathy but, along with mesangial immune complex deposition, is usually an immune-mediated process.

Hyperplastic arteriolosclerosis is the 'onion skin' appearance of arterioles in malignant hypertension.



[Q: 1577] OnExamination 2012 - Nephrology

In chronic untreated renal failure which of the following findings is characteristic?

- 1- Hypercalcaemia
- 2- Hypercalcinuria
- 3- Hyperosmolar dehydration
- 4- Hypokalaemia
- 5- Metabolic alkalosis

Answer & Comments

Answer: 2- Hypercalcinuria

Major pathophysiological abnormalities of chronic renal failure:

Accumulation of nitrogenous waste products

Acidosis: bicarbonate wasting, decreased ammonia secretion, decreased acid excretion

Sodium wasting: solute diuresis, tubular damage

Sodium retention: nephrotic syndrome, CCF, anuria, excess sodium intake

Urinary concentrating defect: nephron loss, solute diuresis

Hyperkalaemia: decreased glomerular filtration rate (GFR), acidosis, hyperaldosteronism

Renal osteodystrophy: decreased intestinal calcium absorption, impaired 1,25-dihydroxy vitamin D production, secondary hyperparathyroidism

Growth retardation: protein calorie deficiency, renal osteodystrophy, acidosis, anaemia

Anaemia: decreased erythropoietin production, low grade haemolysis, inadequate intake

Bleeding tendency: thrombocytopenia, decreased platelet function

Infection: defective granulocyte function

Neurology: uraemia, aluminium toxicity results in fatigue, poor concentration, headache, memory loss, slurred speech, muscle weakness and cramps, seizures and coma

GI ulceration: gastric acid hypersecretion

Hypertension: sodium and water overload, hyperammonaemia

Hypertriglyceridaemia: decreased plasma lipoprotein lipase activity

Pericarditis and cardiomyopathy: cause unknown

Glucose intolerance: tissue insulin resistance.



[Q: 1578] OnExamination 2012 - Nephrology

You are taking part in a clinical trial for a new monoclonal antibody designed to increase the population of T regulatory cells for treating a range of T cell mediated autoimmune disorders.

Which of the following is a feature of T regulatory cells?

- 1- 20% of mature CD4 positive cells are regulatory T cells
- 2- CD4+ CD25+ are thought to be the most important T regulatory cell population
- 3- No CD8+ T regulatory cells exist
- 4- Regulatory cells do not express CD3 receptors
- 5- They produce large amounts of IL-2

Answer & Comments

Answer: 2- CD4+ CD25+ are thought to be the most important T regulatory cell population

CD4+ CD25+ Fox-P3 + T regulatory cells are thought to be the most important T regulatory cell population. They are thought to play an important role in regulating immune responses after invading organisms have been tackled and preventing the development of autoimmunity.

Regulatory T cells are not thought to produce IL-2.

A small population of CD8+ human regulatory T cells has been identified in addition to the larger population of CD4+ regulatory cells.

All T cells express the CD3 receptor, and in humans 5-10% of CD4+ cells are regulatory T cells.



[Q: 1579] OnExamination 2012 - Nephrology

In which of the following circumstances would the treatment of anaemia with erythropoetin still be expected to be effective?

- 1- Aluminium toxicity
- 2- Folate deficiency
- 3- Hyperkalaemia
- 4- Infection
- 5- Iron deficiency

Answer & Comments

Answer: 3- Hyperkalaemia

Epoetin (recombinant human erythropoetin) is used:

In chronic renal failure

To shorten the period of anaemia in those receiving platinum-based chemotherapy and

Prevention of anaemia in premature babies with low birth weight.

Its efficacy may be impaired in certain circumstances particularly with iron deficiency but also with aluminium toxicity, folate deficiency and infection. In the latter the switch to the acute phase proteins impairs its function.

Its efficacy is unimpaired in hyperkalaemia.



[Q: 1580] OnExamination 2012 - Nephrology

Which of the following is the best imaging to identify renal scarring, for instance after childhood febrile urinary tract infection?

- 1- Renal ultrasonography
- 2- Voiding cystourethrography
- 3- Renal DMSA scintigraphy
- 4- Renal DTPA scintigraphy
- 5- Intravenous pyelography

Answer & Comments

Answer: 3- Renal DMSA scintigraphy

Renal scintigraphy with DMSA involves administration of radioactive isotope which is avidly taken up by the renal parenchyma (option C). This permits the identification of regions of decreased uptake that may represent acute inflammation (such as pyelonephritis) or renal scarring.

The technique of dimercaptosuccinic acid DMSA scan (option C) also allows detection of congenital renal disorder.

A small kidney with uniform uptake of DMSA is likely to represent congenital hypodysplasia, whereas a focal area of reduced cortical uptake associated with loss of contours is more likely to represent an infection-related scar.

Renal DTPA involves an isotope that is exclusively filtered by the glomeruli, and is used to give a "perfusion index" and evaluate excretion (obstruction assessment) of the kidney (hence option D incorrect).

Voiding cystourethrography is used to determine whether there is vesicoureteral reflux, which might give an increased risk (but not diagnostic) of renal scarring (hence option B incorrect).

Ultrasonography (option A) also does not reliably detect low-grade scarring.



[Q: 1581] OnExamination 2012 - Nephrology

You are asked to see a haemodialysis patient who developed high fever one hour after initiation of dialysis.

Her dialysis was performed using a tunnelled right internal jugular vein catheter, which has been in place and functioning for one year. No other vascular access has been created.

The current catheter exit site looked clean. Examination showed no cardiac murmur. Blood cultures were drawn from the catheter and her peripheral arm; both grew methicillin-resistant *Staphylococcus aureus* (MRSA).

Which one of the following best describes the correct treatment approach?

- 1- Discharge the patient with oral cloxacillin.
- 2- Administer vancomycin
- 3- Administer vancomycin and remove the central venous catheter

4- Administer vancomycin, keep the central venous catheter but add concomitant antibiotic lock (making use of supratherapeutic concentrations of vancomycin within the catheter lumen after each dialysis session).

5- Administer vancomycin and gentamicin.

Answer & Comments

Answer: 3- Administer vancomycin and remove the central venous catheter

Catheter removal (option C) is strongly recommended in *Staphylococcus aureus* bloodstream infection given the high risk of recurrence in these patients.

Cloxacillin should not be used in MRSA infection (option A incorrect); vancomycin is the drug of choice.

Daptomycin might be needed if minimum inhibitory concentration is ≥ 2 µg/ml indicative of heterogeneous vancomycin intermediate *S. aureus* (hVISA).

We strongly advise catheter removal in the following circumstances of catheter-related bloodstream infection:

- Severe sepsis
- Haemodynamic instability
- Endocarditis
- Evidence of metastatic infection, or
- Persistence of bacteraemia after 48-72 hours of effective antibiotics.

Furthermore, salvage of catheter is more reserved for low-virulence pathogens such as coagulase negative *Staphylococci*, but not MRSA.

Antibiotic lock therapy involves instillation of high-dose antibiotics (prepared using heparin) at the end of each dialysis session into the catheter to maintain high concentrations within the dialysis catheter.

The reported success rate to salvage a tunneled catheter using a combination of systemic antimicrobials and antibiotic lock therapy is only 40% to 55% (option D) with *S. aureus* (compared with 75% to 84% with coagulase negative Staphylococci).



[Q: 1582] OnExamination 2012 - Nephrology

A 42-year-old woman presents to nephrology clinic. She has end stage renal disease due to type 1 diabetes mellitus, and is awaiting transplant. She has been using peritoneal dialysis for six months.

She is complaining of fatigue and you note her haemoglobin to be 9.6 g/dl. You are considering commencing erythropoietin treatment.

What is the most common side effect of erythropoietin when used in patients with chronic kidney disease?

- 1- Blurred vision
- 2- Hepatotoxicity
- 3- Hypertension
- 4- Hypokalaemia
- 5- Thrombocytopenia

Answer & Comments

Answer: 3- Hypertension

Erythropoietin therapy may be considered in patients with chronic kidney disease who have anaemia to increase haemoglobin concentration to 11-12 g/dl.

Serious side-effects of erythropoietin when used in chronic kidney disease are:

- Hypertension - 20% of patients require increased antihypertensive therapy
- Seizures
- Thromboembolic disease
- Anaphylaxis

Failure of treatment - this may be due to untreated iron deficiency, marrow fibrosis, drug therapy, development of antibodies against the treatment, testosterone deficiency in males, or poor compliance.

Blurred vision is not a recognised side effect.

Hepatotoxicity is not a recognised side effect.

New or worsening hypertension is a common side effect of erythropoietin therapy. Twenty per cent of patients will require increased antihypertensive therapy. Erythropoietin may even precipitate a hypertensive crisis.

Hypokalaemia is not a recognised side effect. Instead, hyperkalaemia may occur.

Thrombocytopenia is not a recognised side effect. A dose-dependent rise in platelet count is common, due to erythropoietin affinity for thrombopoietin receptors.



[Q: 1583] OnExamination 2012 - Nephrology

A 23-year-old patient on regular haemodialysis was admitted to the hospital after exertional dyspnoea and atrial fibrillation.

A troponin T laboratory request was made.

What opinion would you formulate?

- 1- A rise in cardiac troponin compared with previous one would support the presence of myocardial ischaemia.
- 2- Any troponin level identifies a patient at greater risk of death compared with a patient without elevated troponin, but this observation does not hold in dialysis population.
- 3- Cardiac troponin test has no diagnostic role in patients undergoing dialysis; it should not be requested.
- 4- He is too young to have cardiovascular disease; troponin test can be omitted.
- 5- None of above.

Answer & Comments

Answer: 1- A rise in cardiac troponin compared with previous one would support the presence of myocardial ischaemia.

The pre-test probability of cardiovascular disease is high in dialysis patients, but the cardiac troponin biomarker should be interpreted in the context of the clinical history and examination for any dialysis patient.

The cardiac troponin tests are frequently elevated in asymptomatic patients undergoing dialysis. In dialysis patients with acute cardiac symptoms, a rising trend in troponin (option A) should still suggest significant myocardial ischaemia.

The option D is incorrect because dialysis patients have exceptionally high risk of cardiovascular disease burden.

A minor issue is that the effect of haemodialysis on cardiac troponin levels remains controversial. By convention, the troponin is best measured on a pre-dialysis blood sample (unless clinical symptoms dictate otherwise).



[Q: 1584] OnExamination 2012 - Nephrology

A 54-year-old man was electively admitted for hernia repair.

Prior to surgery, you detected a serum phosphate level of 0.76 mmol/L (reference range 0.80-1.5 mmol/L). The remainder of his laboratory tests were normal.

What would be the most likely cause?

- 1- Laboratory error
- 2- Hyperventilation after painful venepuncture by a new intern
- 3- Oncogenic hypophosphataemic osteomalacia
- 4- Tumour lysis syndrome

5- X linked hypophosphataemic rickets

Answer & Comments

Answer: 2- Hyperventilation after painful venepuncture by a new intern

The three major mechanisms of hypophosphataemia are

Redistribution of extracellular phosphate into cells

Decreased intestinal absorption and

Depletion due to increased urinary loss.

The correct option in this question is from the first mechanism.

When a patient hyperventilates (option B), there is a rise in intracellular pH (fall in partial pressure of carbon dioxide, which can readily diffuse across cell membranes). The rise in pH then stimulates phosphofructokinase activity, which in turn activates glycolysis.

The options E and C belong to the third mechanism of urinary excretion, but there are no hints to suggest so in the question.

Tumour lysis syndrome (option D) is incorrect because it causes hyperphosphataemia (and hyperkalaemia) instead of low phosphate level.



[Q: 1585] OnExamination 2012 - Nephrology

A 40-year-old gentleman required high doses of intravenous diuretics after his renal transplant for the purposes of fluid management.

Soon after administration he developed hearing loss, tinnitus and vertigo.

Which diuretic is most likely to have caused this?

- 1- Acetazolamide
- 2- Bendroflumethiazide
- 3- Furosemide

4- Spironolactone

5- Triamterene

Answer & Comments

Answer: 3- Furosemide

Use of diuretics has variable side effects, predominantly electrolyte derangement.

Loop diuretics such as furosemide are associated with ototoxicity.

Thiazide diuretics such as bendroflumethiazide do not have this association; neither do potassium sparing diuretics such as spironolactone and triamterene.

Acetazolamide, a carbonic anhydrase inhibitor, is not usually associated with ototoxicity.



[Q: 1586] OnExamination 2012 - Nephrology

Which of the following criteria fit with a diagnosis of syndrome of inappropriate antidiuretic hormone secretion (SIADH)?

1- Addison's disease

2- Hypernatraemia

3- Serum hyperosmolality

4- Urine osmolality greater than 100milliosmoles/kg

5- Urine sodium less than 20mmol/litre

Answer & Comments

Answer: 4- Urine osmolality greater than 100milliosmoles/kg

SIADH is characterised by the following essential criteria:

Normal renal, adrenal and thyroid function

No recent use of diuretics

Clinical euvolaemia

Decreased serum osmolality (less than 275 milliosmoles/kg of water)

Increased urine osmolality (more than 100 milliosmoles/Kg of water) in the context of hypotonic serum.

Addison's disease is an alternative cause of hyponatraemia and does not fit into SIADH.

Hypernatraemia does not fit as the patient should be hyponatraemic in SIADH.

With water retention, serum should be hypo-osmolar rather than hyperosmolar.

Urine sodium less than 20mmol/litre suggests a dilute rather than concentrated urine. The urine sodium is typically >20mmol/litre in SIADH.

Reference:

Ellison D, Berl T. The syndrome of inappropriate antidiuresis. *N Engl J Med.* 17 May 2007;356(20):2064-72.



[Q: 1587] OnExamination 2012 - Nephrology

The healthy adult usually ingests about 8400 mg per week of phosphate through their diet, the majority of which is excreted through faeces and the kidney.

Which of the answers below is the best approximation for the amount of phosphate excreted through the kidneys every week?

1- 1200 mg

2- 2400 mg

3- 3000 mg

4- 5400 mg

5- 6000 mg

Answer & Comments

Answer: 4- 5400 mg

The kidney plays a significant role in phosphate excretion which is why long term

impairment of kidney function disrupts phosphate excretion.

Not only does hyperphosphataemia affect calcium and bone metabolism, but it is associated with increased cardiovascular mortality.

About 5400 mg of phosphate is excreted per week through the kidneys.

The other answers are incorrect estimates of phosphate excretion and should not be selected.

Reference:

Tonelli M, Pannu N, Manns B. Oral phosphate binders in patients with kidney failure. *N Engl J Med.* 8 Apr 2010;362(14):1312-24.



[Q: 1588] OnExamination 2012 - Nephrology

A 37-year-old gentleman presents with renal colic and has confirmed renal stones on radiological imaging.

He is treated with analgesia and sent home with follow up by the urology team. He manages to pass a stone in his urine and this is sent for analysis.

What is the most common composition of renal stones in the general population?

- 1- Calcium oxalate
- 2- Calcium phosphate
- 3- Cystine
- 4- Magnesium ammonium phosphate
- 5- Uric acid

Answer & Comments

Answer: 1- Calcium oxalate

Calcium oxalate stones (option A) are the most frequent, followed by calcium phosphate (option B). Together these make up a significant majority of stones.

Cystine stones (option C) are rare and associated with tubular defects. This answer should not be selected.

Magnesium ammonium phosphate stones (option D) are associated with urea splitting organisms and are not common.

Uric acid stones (option E) make up about 5-10% of stones and are less common than calcium based stones.

Reference:

Moe OW. Kidney Stones: pathophysiology and medical management. *Lancet.* 2006 Jan 28;367(9507):333-44



[Q: 1589] OnExamination 2012 - Nephrology

An 85-year-old woman presents to the medical intake with oliguria and dark urine following a mechanical fall and a long-lie of 20 hours.

She has acute kidney injury with a glomerular filtration rate of 32 ml/min/1.73m³ and creatine kinase is raised at 25,000 (normal range 25-195 iu/l).

You commence initial therapy and prescribe her regular medications.

Which of her medications is it most important to stop in these circumstances?

- 1- Aspirin 75 mg PO OD
- 2- Oral calcium supplements
- 3- Paracetamol 1 g PO QDS
- 4- Salbutamol inhaler PRN
- 5- Simvastatin 40 mg PO ON

Answer & Comments

Answer: 5- Simvastatin 40 mg PO ON

Initial management is that of rehydration and correction of electrolyte disturbances.

Administration of bicarbonate in cases where the urine pH is less than 6.5 despite fluid repletion has been advocated.

Statins should be avoided in patients with rhabdomyolysis due to myotoxicity.

In those taking statins the risk of sporadic rhabdomyolysis is 0.44 per 10,000 patients per year.

Relatively safe in these circumstances are:

- Asprin
- Oral calcium
- Paracetamol
- Inhaled salbutamol.

Statins are myotoxic and can cause rhabdomyolysis independent from trauma. They should be stopped in any patient presenting with the syndrome.



[Q: 1590] OnExamination 2012 - Nephrology

A 14-year-old boy is referred by the practice nurse for follow up with you. He was brought by his mother to see the practice nurse because of progressive hearing loss.

Examination and basic investigations revealed nothing of note, apart from haematuria detected on routine urine testing. Apparently he has an 18-year-old brother who also suffers from deafness and has mild renal impairment.

Investigations show:

- Haemoglobin 13.0 g/dl(13.5-18)
- White cell count $7.1 \times 10^9/L$ (4-10)
- Platelets $199 \times 10^9/L$ (150-400)
- Sodium 140 mmol/l (134-143)
- Potassium 4.7 mmol/l (3.5-5)
- Creatinine 110 $\mu\text{mol/l}$ (60-120)
- ESR 8 (<10)
- Urine Blood +

Which of the following is the most likely diagnosis?

- 1- Alport's syndrome
- 2- Autosomal dominant polycystic kidney disease

- 3- IgA nephropathy
- 4- Membranous nephropathy
- 5- Minimal change disease

Answer & Comments

Answer: 1- Alport's syndrome

Alport's syndrome comprises:

- Sensorineural hearing loss
- Progressive renal failure
- Haematuria
- Ocular abnormalities including cataract formation.

The condition is often associated with an X linked dominant inheritance pattern and hence males are more severely affected.

Prevalence is around 1 in 5000, and the condition occurs because of type 4 collagen mutations. Deafness usually occurs before the onset of renal failure, which is related itself to progressive nephritis.

Rigorous control of hypertension may delay the onset of end stage renal failure, which is seen in 90% of patients with Alport's by the age of 40 years.



[Q: 1591] OnExamination 2012 - Nephrology

A 39-year-old female presents with polyuria and is passing 4 litres of urine per day. She was recently started on a new medication.

Results show:

- Serum Sodium 144 mmol/L(137-144)
- Plasma osmolality 299 mosmol/L(275-290)
- Urine osmolality 210 mosmol/L(350-1000)

Which of the following drugs was prescribed?

- 1- Aspirin
- 2- Fluoxetine
- 3- Glibenclamide
- 4- Lithium

5- Metoprolol

Answer & Comments

Answer: 4- Lithium

This lady has eunatraemia, hypertonicity (high serum osmolality) and inappropriately dilute urine which is consistent with diabetes insipidus.

Of the drugs listed lithium would be the most likely to cause a nephrogenic DI.



[Q: 1592] OnExamination 2012 - Nephrology

A 36-year-old male is referred with chronic renal dysfunction and is discovered to have adult polycystic kidney disease.

Which of the following proteins is associated with the development of APKD?

- 1- Cyst specific binding protein
- 2- Matrix metalloproteinase
- 3- Polycystin-1
- 4- Progesterone binding cyst-protein
- 5- Type 1 collagen

Answer & Comments

Answer: 3- Polycystin-1

Autosomal dominant APKD-1 is a relatively common disorder accounting for approximately 8% of cases of end-stage renal disease (ESRD).

Eighty five percent of cases are due to the defect in PKD-1 locus on chromosome 16p13.3.

PKD-1 encodes a large protein, polycystin, which seems to be involved in cell to cell matrix interaction.



[Q: 1593] OnExamination 2012 - Nephrology

A 28-year-old man presented with hypertension.

On examination he had palpable kidneys and abdominal ultrasound shows bilaterally enlarged cystic kidneys.

Which one of the following conditions is most likely to be present in this patient?

- 1- Mitral stenosis
- 2- Nail dystrophy
- 3- Polycythaemia
- 4- Short stature
- 5- Testicular atrophy

Answer & Comments

Answer: 3- Polycythaemia

The most likely diagnosis here is adult polycystic kidney disease, which is associated with valvular heart abnormalities, incompetence and aneurysms of the cerebral circulation.

However, it is also associated with excessive erythropoietin production and polycythaemia.



[Q: 1594] OnExamination 2012 - Nephrology

A 14-year-old old boy presents with a sore throat and macroscopic haematuria.

What would light microscopy of a kidney biopsy most likely show?

- 1- Collapsed glomeruli
- 2- Crescentic glomerulonephritis
- 3- Mesangial hypercellularity
- 4- Normal tissue
- 5- Segmental sclerosis

Answer & Comments

Answer: 3- Mesangial hypercellularity

The most common cause of macroscopic haematuria in a child is IgA nephritis.

This usually develops one to two days after a sore throat. It is most common in the second and third decades of life and is three times more common in males.

The urine may be frankly bloody or may be the colour of cola. There are no clots in the urine and the haematuria is generally painless although some patients complain of mild loin pain.

It tends to settle spontaneously within five days although the episodes may be recurrent lasting for one to two years.

Renal biopsy will show mesangial IgA deposition on immunofluorescence and light microscopy will show mesangial hypercellularity and matrix expansion.



[Q: 1595] OnExamination 2012 - Nephrology

Which of the following is least true regarding IgA nephropathy?

- 1- Commonly follows a sore throat
- 2- Is the most common glomerulonephritis in the world
- 3- Light chains may be found in the urine
- 4- May be associated with a rash and arthritis
- 5- Predominantly affects young men

Answer & Comments

Answer: 3- Light chains may be found in the urine

IgA nephropathy (Berger's disease) is the most common glomerulonephritis worldwide and characteristically affects young males, presenting with frank haematuria after an episode of pharyngitis.

However it may also present with proteinuria, microscopic haematuria, renal failure or hypertension.

It is probably part of a spectrum of disease with Henoch-Schönlein purpura, which presents with arthritis, rash, abdominal pain and nephritis. In both there are mesangial IgA deposits in the kidney.



[Q: 1596] OnExamination 2012 - Nephrology

A 70-year-old man is admitted to hospital complaining of a twelve day history of loin pain, fevers and occasional rigors. On examination, his temperature is 37.9°C. The renal function is normal.

Urinalysis of a mid stream urine shows:

White cell count >100/mm³

Red cell count >50/mm³

No organisms seen, with no growth.

Which would be your first investigation of choice?

- 1- CT abdomen and pelvis
- 2- Intravenous urogram (IVU)
- 3- Prostatic specific antigen (PSA) measurement
- 4- Transthoracic echocardiogram
- 5- Ultrasound scan renal tract

Answer & Comments

Answer: 5- Ultrasound scan renal tract

Renal cell carcinomas may present in a variety of ways, with only a minority being diagnosed with the classical triad of:

Haematuria

Loin pain

A palpable mass.

Relatively common presentations include:

Anaemia

Hypertension

Pyrexia of unknown origin

Fatigue

Increased plasma viscosity.

Less common presentations include:

Hypercalcaemia

Polycythaemia

Liver dysfunction

Enteropathy

Myopathy.

Urinalysis may show sterile pyuria, as here.

Other causes of sterile pyuria are:

Partially treated urinary tract infections

Tuberculosis of the renal tract

Urethritis and sexually transmitted diseases

Acute glomerulonephritis

Tubulo-interstitial diseases

Adult polycystic kidney disease

Renal stones.

Ultrasound scan of the renal tract would be the first investigation of choice, as it is able to pick up 95% of renal cell carcinomas greater than 1 cm in diameter. It would also exclude infective or inflammatory collections within the renal tract.

If required a computerised tomography (CT) +/- guided biopsy could be obtained to prove the diagnosis.

An intravenous urogram (IVU) was considered the investigation of choice before the advent of ultrasound.

A chest x ray and bone scan would be required to complete the basic investigations.



[Q: 1597] OnExamination 2012 - Nephrology

A 25-year-old man developed bilateral loin pain and frank haematuria.

His symptoms had started 24 hours after developing a sore throat. His blood pressure was 138/88 mmHg. Urinalysis was positive for blood (4+) and protein (2+).

What is the most likely diagnosis?

1- IgA nephropathy

2- Microscopic polyangiitis

3- Nephrolithiasis

4- Post-streptococcal glomerulonephritis

5- Septicaemia

Answer & Comments

Answer: 1- IgA nephropathy

The acute onset of the disease is suggestive of IgA nephropathy which characteristically occurs in young males in their 20s and 30s.

Haematuria occurs within 12-24 hours of pharyngitis, accompanied also by loin pain, muscle pain and fever. Prognosis is usually good especially in children. In adults, between 25-50% may develop end-stage renal failure. No specific treatment is available.

Classically, the patient has streptococcal infection one to three weeks before the onset of acute nephritic syndrome (post-strep GN).

There is a long prodromal systemic illness lasting months or years in microscopic polyangiitis which differs from Wegener's granulomatosis in its absence of respiratory tract granulomatous inflammation.



[Q: 1598] OnExamination 2012 - Nephrology

Acute renal failure may be distinguished from chronic renal failure by which of the following?

1- An increased urinary Na excretion

2- Hyperkalaemia

3- Hypophosphataemia

4- Left ventricular hypertrophy (LVH) on the ECG

5- Renal size on ultrasound scan (USS)

Answer & Comments

Answer: 5- Renal size on ultrasound scan (USS)

Small kidneys on USS suggest chronic renal failure but the following causes of chronic renal failure can present with normal/enlarged kidneys:

- Amyloidosis
- Polycystic kidney disease
- Diabetic glomerulosclerosis
- Scleroderma
- Rapidly progressive glomerulonephritis.

Decreased fractional Na clearance, hyperphosphataemia and hyperkalaemia are features of acute or chronic renal failure.

LVH is probably more likely to be seen in chronic renal failure but is not reliable.



[Q: 1599] OnExamination 2012 - Nephrology

Which of the following is a feature of pseudohypoparathyroidism?

- 1- Increased urinary phosphate and cAMP with PTH infusion
- 2- Low serum calcium and high serum phosphate
- 3- Low serum calcium and low serum phosphate
- 4- Low serum PTH
- 5- Shortened second and third metacarpals

Answer & Comments

Answer: 2- Low serum calcium and high serum phosphate

The biochemistry shows a hypocalcaemia with hyperphosphataemia being usual but elevated parathyroid hormone (PTH) due to resistance to PTH.

This is due to mutation of the PTH receptor with abnormality of the G α subunit with reduced cyclic adenosine monophosphate (cAMP) production following a PTH infusion.

There are associated phenotypic signs including short stature, low IQ and shortened fourth and fifth metacarpals.



[Q: 1600] OnExamination 2012 - Nephrology

A 55-year-old male is admitted to hospital with a four week history of breathlessness and dry cough.

He has a medical history of longstanding asthma and intermittent tension headaches for which he takes simple analgesia.

On clinical examination he appears pale and unwell. His blood pressure is 170/95 mmHg. Heart sounds are normal and the chest is clear. A few non-blanching skin lesions less than 5 mm in size are found on lower limbs.

Investigations show:

Hb 8 g/dl (13.0 - 18.0 g/dL)

WCC $10 \times 10^9/L$ (4 - $11 \times 10^9/L$)

Neutrophils $7 \times 10^9/L$ ($1.5 - 7 \times 10^9/L$)

Lymphocytes $1.8 \times 10^9/L$ ($1.5 - 4 \times 10^9/L$)

Eosinophils $1.2 \times 10^9/L$ ($0.04 - 0.4 \times 10^9/L$)

ESR 55mm/hr (0 - 15 mm/1st hr)

CRP 45mg/L (< 10 mg/L)

Sodium 134mmol/l (137 - 144 mmol/L)

Potassium 4.7mmol/l (3.5 - 4.9 mmol/L)

Creatinine 650mmol/l (60 - 110 μ mol/L)

Urine dipstick shows blood ++ and protein +++.

Renal ultrasound: both kidneys normal in size, no evidence of urinary obstruction.

What is the most likely diagnosis?

- 1- Analgesic nephropathy
- 2- Churg-Strauss syndrome
- 3- IgA nephritis
- 4- Rapidly progressive glomerulonephritis
- 5- Renal amyloidosis

Answer & Comments

Answer: 2- Churg-Strauss syndrome

A. Analgesic nephropathy: incorrect.

This may cause insidious onset of renal failure but is not associated with elevated inflammatory markers, eosinophilia, or asthma.

B. Churg-Strauss syndrome: correct.

Acute presentation with glomerulonephritis, eosinophilia, skin vasculitis, and elevated inflammatory markers on a background of longstanding asthma makes Churg-Strauss the most likely diagnosis.

C. IgA nephritis: incorrect.

IgA nephropathy can be associated with glomerulonephritis but does not explain the skin changes or the asthma.

D. Rapidly progressive glomerulonephritis: incorrect.

Rapidly progressive glomerulonephritis can cause acute presentation with renal failure and rarely with eosinophilia. However, the asthma and skin vasculitis make Churg-Strauss a more likely diagnosis in this scenario.

E. Renal amyloidosis: incorrect.

The presentation in amyloidosis is usually chronic rather than acute and the renal ultrasound scan does not support amyloidosis which is usually associated with enlarged kidneys.



[Q: 1601] OnExamination 2012 - Nephrology

The following are complications of nephrotic syndrome with the exception of which?

- 1- Accelerated hypertension
- 2- Acute renal failure
- 3- Hypocalcaemia
- 4- Pneumococcal infection

5- Venous thrombosis

Answer & Comments

Answer: 1- Accelerated hypertension

Complications also include hyperlipidaemia, protein malnutrition and loss of binding proteins in urine.

Nephrotic syndrome is likely to be associated with hypocalcaemia (vitamin D binding protein and vitamin D lost in nephrotic urine) and hypovolaemia (low blood pressure).



[Q: 1602] OnExamination 2012 - Nephrology

A 22-year-old woman presents with features of nephrotic syndrome and a renal biopsy is performed.

What would you expect to see on light and electron microscopy if you were expecting a diagnosis of minimal change disease?

- 1- Fusion of foot processes of podocytes is seen on light microscopy
- 2- In advanced disease there is hyalinisation of glomeruli seen on light microscopy
- 3- The glomerular basement membrane is normal on electron microscopy
- 4- Tubules may show calcification in lining cells on light microscopy
- 5- Wire-loop lesions are seen on light microscopy

Answer & Comments

Answer: 3- The glomerular basement membrane is normal on electron microscopy

Minimal change disease is typically seen in children less than 6-years-old and in a minority of adults with nephrotic syndrome.

There is no glomerular abnormality on light microscopy.

Electron microscopy shows fusion of foot processes of podocytes and a normal basement membrane.

Treatment is with steroids; disease remission occurs within two weeks although relapse may occur.

A. Fusion of foot processes of podocytes is seen on electron microscopy, not light microscopy.

B. There is no hyalinisation; this is an abnormality seen in other renal diseases, such as amyloidosis.

C. The glomerular basement membrane is normal on electron microscopy, though there is abnormality of podocytes with fusion of foot processes.

D. Tubules may show accumulation of lipid in lining cells on light microscopy, but not calcification.

E. Light microscopy reveals no glomerular abnormalities. Wire-loop lesions are seen in post-infectious glomerulonephritis and lupus nephritis.



[Q: 1603] OnExamination 2012 - Nephrology

During the evaluation of a patient who developed hyperkalaemia, you went through the drug chart.

Which of the following items can be continued without the worry of worsening hyperkalaemia?

- 1- Cyclosporine.
- 2- Digoxin
- 3- Ibuprofen
- 4- Spironolactone
- 5- Thyroxine

Answer & Comments

Answer: 5- Thyroxine

Thyroxine does not cause or exacerbate hyperkalaemia.

Translocation of potassium from the cells into the extracellular space can occur from digoxin overdose due to its dose-dependent Na-K-ATPase pump inhibition.

Other common mechanisms include impaired urinary potassium excretion, notably hypoaldosteronism.



[Q: 1604] OnExamination 2012 - Nephrology

A 74-year-old gentleman with dementia is admitted from the nursing staff, with worsening confusion and inability to eat and drink.

He is clinically dehydrated and his serum sodium laboratory value is measured at 168 mmol/litre.

Assuming the normal serum sodium value is 140 mmol/litre, and his total body water is 40 litres, calculate the free water deficit.

- 1- 1 litre
- 2- 5 litres
- 3- 8 litres
- 4- 15 litres
- 5- 20 litres

Answer & Comments

Answer: 3- 8 litres

The free water calculation is as follows:

(Serum sodium-140)/ 140) x total body water = free water deficit in litres.

$(168-140/140) = 0.2$

$0.2 \times 40 = 8 \text{ litres.}$

The calculation for free water deficit is demonstrated above. 1 litre and 5 litres are underestimates of the free water deficit and so these should not be selected. 15 litres and

20 litres are overestimates and these should not be selected.



[Q: 1605] OnExamination 2012 - Nephrology

A 65-year-old with type 2 diabetes mellitus and a heavy smoking history is started on an angiotensin-converting enzyme inhibitor (ACEI) for high blood pressure.

His creatinine subsequently doubles from 100 $\mu\text{mol/l}$ to 200 $\mu\text{mol/l}$. His general practitioner is concerned about the possibility of renal artery stenosis.

Which of the following investigations would give the highest diagnostic yield for this condition?

- 1- CT abdomen
- 2- CT abdomen with contrast
- 3- Duplex ultrasonography
- 4- Magnetic resonance angiogram (MRA)
- 5- Plasma renin levels

Answer & Comments

Answer: 4- Magnetic resonance angiogram (MRA)

Renal artery stenosis is an important cause of hypertension to recognise.

A rise in creatinine of 15% from baseline is expected with commencement of an ACE-inhibitor.

In this vignette, the large rise in creatinine should warrant a search for renal artery stenosis given the likelihood of vascular disease.

Of the investigations listed, CT abdomen and CT abdomen with contrast should not be selected as CT imaging should be directed towards the aorta and not the abdomen.

Plasma renin levels can be measured but lack specificity.

Duplex ultrasonography is a common first line investigation but may not be diagnostic due to technical difficulties (obese patients, overlying bowel gas).

This leaves MRA as the top choice for investigating renal artery stenosis.

Reference:

Dworkin L, Cooper C. Renal-artery stenosis. *N Engl J Med.* 12 Nov 2009;361(20):1972-8 (log-in required).



[Q: 1606] OnExamination 2012 - Nephrology

A 30-year-old gentleman with a history of heavy alcohol intake presents with macroscopic haematuria.

He reports having an upper respiratory tract infection in the last two days. His renal function continues to decline and he is evaluated in the renal unit. His serum C3 is normal.

What is a biopsy of his kidneys most likely to show?

- 1- C4d staining positive
- 2- Effacement of podocytes on electron microscopy
- 3- Humps in the subepithelial space on electron microscopy
- 4- IgA deposition in the mesangium
- 5- Tram track pattern on light microscopy

Answer & Comments

Answer: 4- IgA deposition in the mesangium

The history of alcohol excess and macroscopic haematuria soon after an upper respiratory tract infection should point the candidate towards IgA nephropathy. This is further confirmed by the normal C3 level.

C4d staining positive is incorrect as this refers to detection of BK virus by the C4d stain.

Podocyte effacement is incorrect as this is diagnostic of minimal change disease.

The hump-like appearance in subepithelial space is characteristic of post-streptococcal glomerulonephritis.

The tram track appearance on light microscopy represents membranoproliferative glomerulonephritis and therefore should not be selected.



[Q: 1607] OnExamination 2012 - Nephrology

The healthy adult kidney excretes 5400 mg per week of phosphate.

What is the maximum amount of phosphate that can be removed by dialysis per week in a patient with anuric renal failure who is dialysis dependent?

- 1- 200 mg
- 2- 500 mg
- 3- 800 mg
- 4- 2700 mg
- 5- 5000 mg

Answer & Comments

Answer: 4- 2700 mg

This question illustrates the the problem with phosphate clearance in patients with renal failure.

Dialysis is able to remove only about half of the phosphate that the healthy kidney would be able to do.

2700 mg is correct and the other answers are incorrect. In such patients, strict dietary control and the use of phosphate binders are necessary to prevent accumulation of phosphate.

Reference:

Tonelli M, Pannu N, Manns B. Oral phosphate binders in patients with kidney failure. N Engl J Med. 8 Apr 2010;362(14):1312-24.



[Q: 1608] OnExamination 2012 - Nephrology

According to the National Kidney Foundation, which of the following glomerular filtration rate (GFR) ranges in ml/min/1.73m² is representative of stage III chronic kidney disease (CKD)?

- 1- 0 - 10
- 2- < 15
- 3- 15- 29
- 4- 30-59
- 5- 60-80

Answer & Comments

Answer: 4- 30-59

This question tests knowledge of the classification of chronic kidney disease.

The table below lists stages of CKD and corresponding GFRs.

Options A, B, C and E are not reflective of stage III chronic kidney disease and are therefore incorrect.

Stage	GFR ml/min/1.73m ²	Description
1	>90	Normal or increased GFR with other evidence of renal damage
2	60-89	Slight decrease in GFR, with other evidence of renal damage
3	30-59	Moderate decrease in GFR, with or without other evidence of renal damage
4	15-29	Severe decrease in GFR, with or without other evidence of renal damage
5	<15	Established renal failure



[Q: 1609] OnExamination 2012 - Nephrology

Which of the following diuretics acts as a carbonic anhydrase inhibitor?

- 1- Acetazolamide
- 2- Bumetanide
- 3- Furosemide
- 4- Metolazone
- 5- Spironolactone

Answer & Comments

Answer: 1- Acetazolamide

Furosemide (option C) is wrong as it acts on the ascending limb of the loop of Henle and prevents active water reabsorption in the kidney by blocking the sodium, potassium, chloride co-transport channel.

Bumetanide (option B) has a similar action.

Metolazone (option D) blocks sodium reabsorption in the distal convoluted channel.

Spironolactone (option E) is an aldosterone receptor antagonist at the cortical collecting duct.



[Q: 1610] OnExamination 2012 - Nephrology

A 28-year-old gentleman presents to hospital feeling unwell with a few days history of diarrhoea and abdominal pain. He reports having eaten at a 'burger van' a few days ago.

He has no previous hospitalisations. His initial laboratory tests show new onset renal impairment, anaemia and low platelets. His clotting is normal.

Which of the following pathogens is most likely to be responsible for this presentation?

- 1- Clostridium difficile
- 2- Escherichia coli
- 3- Enterococcus faecalis

- 4- Methicillin resistant D. Staphylococcus aureus (MRSA)
- 5- Streptococcus viridans

Answer & Comments

Answer: 2- Escherichia coli

Haemolytic uraemic syndrome is a syndrome composing of the triad of:

Microangiopathic haemolytic anaemia
Low platelets and
Renal failure.

A number of pathogens are implicated including Escherichia coli.

This presentation is not classical of C. difficile as we are given no risk factors for this in the question stem so option A is incorrect.

Enterococcus faecalis is a bowel commensal which is unlikely to cause the degree of pathology described in this case so option C is incorrect.

There is no reason to suspect this gentleman is MRSA positive so option D is incorrect.

Streptococcus viridans is an upper respiratory tract and throat bacteria. This patient's presentation does not involve that organ system so option E is incorrect.



[Q: 1611] OnExamination 2012 - Nephrology

Which of the following immune complex glomerulonephritides is associated with a normal complement C3?

- 1- Cryoglobulinaemia
- 2- Endocarditis
- 3- IgA nephropathy
- 4- Membranoproliferative GN
- 5- Post-streptococcal GN

Answer & Comments

Answer: 3- IgA nephropathy

Immune complex glomerulonephritides can be classified based on normal or decreased C3.

Of the answers above IgA nephropathy should be selected as this is associated with normal C3.

Cryoglobulinaemia is associated with reduced C3 and C4.

Infective endocarditis is associated with a decrease in complement (C3 and C4).

Both membranoproliferative GN and post-streptococcal GN are associated with reduced C3.



[Q: 1612] OnExamination 2012 - Nephrology

A 28-year-old gentleman presents with haematuria, progressive renal impairment and hearing problems.

Of note there is a strong family history of renal problems with family members requiring dialysis. Further work up of this gentleman leads to a diagnosis of Alport's syndrome.

What is the characteristic otological problem associated with this condition?

- 1- Conductive deafness
- 2- Mastoiditis
- 3- Perforated ear drum
- 4- Recurrent otitis media
- 5- Sensorineural deafness

Answer & Comments

Answer: 5- Sensorineural deafness

Alport's syndrome is associated with sensorineural hearing loss (due to impaired adhesion of the organ of Corti which contains the auditory sensory cells) so option E should be selected.

It is not associated with conductive deafness so option A is incorrect.

There is no increased association with ear infections such as otitis media (option D), mastoiditis (option B) and perforated ear drum (option C). Hence these answers should not be selected.



[Q: 1613] OnExamination 2012 - Nephrology

Inappropriately high parathyroid hormone secretion (PTH) in renal patients can lead to significant bone reabsorption and premature fractures.

Which one of the following is known to stimulate parathyroid hormone production?

- 1- Calcium acetate tablets
- 2- Hypercalcaemia
- 3- Hyperphosphataemia
- 4- Hypophosphataemia
- 5- Serum alkaline phosphatase

Answer & Comments

Answer: 3- Hyperphosphataemia

Hyperphosphataemia (option C) is known directly to stimulate the parathyroid gland to produce PTH.

Hypercalcaemia (option B) and hypophosphataemia (option D) should suppress PTH production via negative feedback pathways. Hence options B and D are incorrect.

Phosphate binders such as calcium acetate (option A) are used to reduce phosphate in the serum and hence lower PTH production.

Serum alkaline phosphatase has no bearing on PTH production but may rise in hyperparathyroid states due to increased bone turnover.

Options A and E are therefore incorrect.



[Q: 1614] OnExamination 2012 -
Nephrology

A 16-year-old boy presents with periorbital and peripheral oedema which has developed over the past few weeks. He had a previous episode some two years earlier but this responded over the course of a few weeks to a course of prednisolone.

On examination he has a BP of 141/80 mmHg, with pulse of 68. His chest is clear but he has bilateral pitting oedema.

Investigations show:

Haemoglobin 12.9 g/dl(13.5-8)

White cell count $6.1 \times 10^9/L$ (4-10)

Platelets $209 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (134-143)

Potassium 4.8 mmol/l (3.5-5)

Creatinine 110 $\mu\text{mol/l}$ (60-120)

Albumin 24 g/l (30-50)

Urine Protein ++

Which of the following represents the most appropriate management plan for him?

- 1- Oral combination corticosteroids and cyclophosphamide
- 2- Oral corticosteroids
- 3- Oral cyclophosphamide
- 4- Oral methotrexate
- 5- Renal biopsy

Answer & Comments

Answer: 2- Oral corticosteroids

The age of this patient and his previous response to corticosteroids is suggestive of an underlying diagnosis of minimal change nephropathy. As such, a further course of corticosteroids is the treatment of choice.

Given the inherent but low risks associated with renal biopsy, it is usually only attempted

when three or more episodes of oedema have occurred.

Very few patients with minimal change disease actually progress to end stage renal disease, and only around 10% of children with the disease suffer from hypertension.



[Q: 1615] OnExamination 2012 -
Nephrology

A 57-year-old woman who has been receiving haemodialysis for the past five years is found dead in bed by her husband. She had a long history of type 1 diabetes for over 20 years and in her later years suffered from neuropathy and retinopathy as well as chronic renal failure. Most recently she was under investigation for angina.

Which of the following is the most likely cause of death in this patient?

- 1- Hyperkalaemia
- 2- Hypoglycaemia
- 3- Myocardial infarction
- 4- Pulmonary embolus
- 5- Stroke

Answer & Comments

Answer: 3- Myocardial infarction

Patients who undergo long term haemodialysis suffer from increasing arterial calcification, which is associated with both increased risk of myocardial infarction and stroke, but the greatest absolute increase is in MI rates.

Interestingly, trials of high dose statins have proved disappointing in the dialysis population, suggesting that calcification drives much of the increased risk.

Whilst both hypoglycaemia and hyperkalaemia are alternative possibilities as causes of death, myocardial infarction is more likely than both to have been responsible.



[Q: 1616] OnExamination 2012 -
Nephrology

Which is the predominant site of effect of thiazide diuretics?

- 1- Cortical collecting duct
- 2- Early distal tubule
- 3- Late distal tubule
- 4- Proximal tubule
- 5- Thick ascending limb, loop of Henle

Answer & Comments

Answer: 2- Early distal tubule

Thiazide diuretics act on the cortical diluting segment of the nephron, predominantly in the early distal tubule.

Loop diuretics mainly act on the thick ascending limb of the loop of Henle.

Potassium sparing diuretics, for example amiloride, act on the distal nephron.



[Q: 1617] OnExamination 2012 -
Nephrology

A 63-year-old female with a 12 year history of hypertension and diabetes has been treated with metformin 1g bd, gliclazide 80 mg bd, rosuvastatin 10 mg daily, ramipril 10 mg daily, aspirin 75 mg daily and amlodipine 10 mg daily for the last two years.

At annual review her blood pressure is 138/82 mmHg, fundi reveal background diabetic retinopathy, foot pulses are normal but she has evidence of a peripheral sensory loss to the ankles in both feet.

Her results show:

HbA1c 7.2%(3.8-6.4)

Urea 12.5 mmol/L(2.5-7.5)

Creatinine 176 µmol/L(60-110)

Cholesterol 4.8 mmol/L(<5.2)

Which of the following drugs should be withdrawn?

- 1- Aspirin
- 2- Gliclazide
- 3- Metformin
- 4- Ramipril
- 5- Rosuvastatin

Answer & Comments

Answer: 3- Metformin

This patient has evidence of chronic renal impairment with elevated creatinine and urea. Guidelines currently suggest that metformin should be stopped if creatinine is above 150 µmol/L.

The estimated prevalence of life-threatening lactic acidosis is one to five cases per 100 000, with mortality in reported cases up to 50%. Traditionally this complication has been thought of as secondary to an accumulation of the drug.

Metformin is excreted unchanged in the urine with the half life prolonged and renal clearance decreased in proportion to any decrease in creatinine clearance. This may occur chronically in chronic renal impairment, or acutely with dehydration, shock, and intravascular administration of iodinated contrast agents, all of which have the potential to alter renal function.

Tissue hypoxia also has a significant role, and acute or chronic conditions that may predispose to this condition, such as sepsis, acute myocardial infarction, pulmonary embolism, cardiac failure and chronic liver disease, may act as triggers.

As the patient appears to have chronic renal impairment and as she has been on ramipril for a considerable period it is unlikely that she has renal artery stenosis requiring the withdrawal of the angiotensin-converting enzyme inhibitor (ACEi).



[Q: 1618] OnExamination 2012 -
Nephrology

A 70-year-old man was referred by his GP with difficulty in treating hypertension.

He had longstanding hypertension which had been well controlled over many years but recently he was found to have a blood pressure of 190/110 mmHg which proved resistant to additional treatment.

He was generally asymptomatic and complied with medication. Investigations showed normal U+Es.

Which one of the following is the most likely cause?

- 1- Chronic pyelonephritis
- 2- Conn's syndrome (primary hyperaldosteronism)
- 3- Pheochromocytoma
- 4- Polycystic kidney disease
- 5- Renovascular disease

Answer & Comments

Answer: 5- Renovascular disease

Primary hyperaldosteronism (Conn's syndrome) typically has hypokalaemic alkalosis.

One should also suspect Conn's with patients resistant to conventional antihypertensive treatment and with the electrolytes in the direction of Conn's without necessarily being outside the normal range (plasma Na > 140 and K < 4).

However, in this patient's case he has longstanding hypertension but has deteriorated. Therefore the most likely cause is renovascular disease related to his hypertension.



[Q: 1619] OnExamination 2012 -
Nephrology

A 63-year-old woman presents following a

visit to the well woman clinic where she is noted to be hypertensive.

She has a history of hip osteoarthritis for which she has taken regular paracetamol.

On examination she is obese with a BMI of 35 (<25), has a blood pressure of 180/100 mmHg and glycosuria is noted.

Her investigations show:

Fasting plasma glucose 18.3 mmol/L (3.0-6.0)

Serum urea 9.8 mmol/L (2.5-7.5)

Serum Creatinine 129 µmol/L (60-110)

24 hour urine protein concentration 1.8 g/d (<0.2)

Normal ultrasonic appearances of both kidneys

Which of the following is the most likely diagnosis?

- 1- Analgesic nephropathy
- 2- Chronic glomerulonephritis
- 3- Diabetic nephropathy
- 4- Hypertensive nephropathy
- 5- Ischaemic nephropathy

Answer & Comments

Answer: 3- Diabetic nephropathy

This patient is diabetic and has proteinuria.

Although diabetic nephropathy usually takes five or more years to evolve, this patient is likely to have had the condition for many years prior to it now being diagnosed.

Ischaemic nephropathy due to renal artery stenosis is unlikely in the presence of a normal renal ultrasound.

Analgesic nephropathy would be a consequence of non-steroidal anti-inflammatory drugs (NSAIDs) not paracetamol.

Hypertensive nephropathy is a possibility but is less likely in the context of her proteinuria and moderately elevated BP.



[Q: 1620] OnExamination 2012 -
Nephrology

A 68-year-old male diagnosed with nephrotic syndrome receives steroid therapy without benefit.

His investigations show an albumin of 20 g/L (37-49), total cholesterol of 12 mmol/L (<5.2), dipstick urinalysis reveals +++ protein and a renal biopsy shows focal segmental glomerulosclerosis.

Which one of the following is most likely to preserve renal function?

- 1- Dietary salt restriction
- 2- Low dietary protein intake
- 3- Ramipril
- 4- Simvastatin
- 5- Warfarin

Answer & Comments

Answer: 3- Ramipril

Approximately 50% of subjects with focal segmental glomerulosclerosis (FSGS) do not respond to steroid therapy but angiotensin-converting enzyme (ACE) inhibitors are a recognised strategy to slow the progression of renal disease.

This patient is clearly at high risk of cardiovascular disease with a very high cholesterol but the question specifically asks about renal disease.



[Q: 1621] OnExamination 2012 -
Nephrology

A 40-year-old man presents with acute weakness and palpitations.

Investigations reveal:

- Sodium 143 mmol/l (137-144)
Potassium 8.0 mmol/l (3.5-4.9)
Urea 35 mmol/l (2.5-7.5)
Creatinine 450 µmol/l (60-110)

Bicarbonate 5 mmol/l (20-28)

What is the best immediate therapy?

- 1- Intravenous calcium gluconate
- 2- Intravenous dextrose and insulin
- 3- Intravenous sodium bicarbonate
- 4- Nebulised salbutamol
- 5- Rectal calcium resonium

Answer & Comments

Answer: 1- Intravenous calcium gluconate

This patient appears to have acute renal failure with severe acidosis, hyperkalaemia and palpitations.

The patient should be rehydrated, treated with insulin and given bicarbonate, but the immediate treatment particularly in the context of a life threatening arrhythmia would be calcium gluconate.



[Q: 1622] OnExamination 2012 -
Nephrology

A 35-year-old presents to the infectious disease team following a new diagnosis of HIV.

Her CD4 count is 150 cells/ mm³ and a viral load is 10,000. She is commenced on anti-retrovirals.

At a follow up appointment four weeks later she has routine blood tests, of which her creatinine is shown below. She is euvolaemic and has not taken any additional medications over the counter.

On presentation her results showed:

Serum creatinine 80 µmol/l (60-90)

and four weeks later:

Serum Creatinine 220 µmol/l (60-90).

Which of the following answers is most likely to be responsible for her acute renal impairment?

- 1- Efavirenz

- 2- HIV associated nephropathy
- 3- Lamivudine
- 4- Non-compliance with medications
- 5- Tenofovir

Answer & Comments

Answer: 5- Tenofovir

This question requires knowledge of the side effects of anti-retroviral medications.

Non-compliance (option D) should not be selected as there is no reason why this would specifically affect renal function. This would be assessed with repeat viral loads and CD4 counts to which we do not have access.

Option B, HIV associated nephropathy, is incorrect given the speed of deterioration in renal function.

Of the anti-retroviral medications, tenofovir is associated with acute renal dysfunction (option E) more than efavirenz (option A) and lamivudine (option C).



[Q: 1623] OnExamination 2012 - Nephrology

Which of the following is a known risk factor for the development of chronic rejection of kidney transplantation?

- 1- Age
- 2- Anti-smooth muscle antibodies
- 3- Presence of anti-HLA antibodies
- 4- Smoking
- 5- Toxoplasma infection

Answer & Comments

Answer: 3- Presence of anti-HLA antibodies

Chronic rejection is characterised by fibrosis of normal organ structures.

The pathogenesis of chronic rejection is not clear - some prefer the term "chronic allograft

dysfunction" since both immunological (antigen-dependent and antigen-independent) and non-immunological factors have been identified.

Cell-mediated and humoral immune mechanisms have been implicated in this form of graft rejection.

It has also been suggested that rejection is a response to chronic ischaemia caused by injury to endothelial cells.

Proliferation of intimal smooth muscle is observed leading to vascular occlusion.

The fact that chronic rejection is rare in transplants between human leukocyte antigen (HLA)-identical siblings suggests that HLA-antigen dependent immunological factors are important.

Risk factors include:

- Number of previous acute rejection episodes
- Presence of anti-HLA antibodies
- Anti-endothelial antibodies
- Cytomegalovirus infection
- Dyslipidaemia
- Hypertension
- Functional mass of the donor kidney and
- Delayed graft function (a clinical manifestation of ischaemia/reperfusion injury).



[Q: 1624] OnExamination 2012 - Nephrology

You are auditing the nephrology department's rates of peritoneal dialysis peritonitis, observing the proportion of cases that are culture positive and the associated organism.

In the United Kingdom, what is the most common causative organism in peritoneal dialysis peritonitis?

- 1- Coagulase negative Staphylococcus

- 2- Enterococcus spp.
- 3- Escherichia coli
- 4- Pseudomonas spp.
- 5- Staphylococcus aureus

Answer & Comments

Answer: 1- Coagulase negative Staphylococcus

Ten percent to 30% of cases are culture negative.

At 20-25% overall, coagulase negative Staphylococcus is the most commonly cultured organism.

With improved hygiene and technique, rates of staphylococcal infection are falling.

Intra-abdominal pathology (such as a ruptured viscus) should be considered if more than one organism is grown, especially if Gram negative or anaerobic.

Repeated treatment increases the risk of resistant organisms. This may require loss of catheter and switch to haemodialysis.

Coagulase negative Staphylococcus is the most commonly cultured organism in peritoneal dialysis peritonitis. It represents 20-25% of cases. It is a skin commensal that opportunistically causes infection through the catheter site.

Enterococcus represents 1-5% of cases and occurs less frequently than coagulase negative Staphylococcus.

Escherichia coli is less common.

Overall, Gram negative organisms represent 10-15% of cases.

Pseudomonas represents 5% of cases and occurs less frequently than coagulase negative Staphylococcus.

Staphylococcus aureus represents 10-15% of cases and occurs less frequently than coagulase negative Staphylococcus.



[Q: 1625] OnExamination 2012 - Nephrology

A 60-year-old man presents to nephrology clinic with fatigue. He has a history of stage four chronic kidney disease, secondary to hypertension.

A full blood count reveals a normocytic anaemia with a haemoglobin concentration of 9.7 g/dl. White cell count and platelets are within normal limits.

You are considering commencing treatment for his anaemia.

What is the most appropriate investigation to help guide treatment?

- 1- Peripheral blood film
- 2- Serum erythropoietin
- 3- Serum ferritin
- 4- Serum lactate dehydrogenase
- 5- Urinary 24 hour creatinine clearance

Answer & Comments

Answer: 3- Serum ferritin

Although endogenous erythropoietin deficiency is a common cause of anaemia, iron deficiency may co-exist and is easily treatable.

Iron deficiency contributes to a poor response to erythropoiesis-stimulating agents.

In patients with haemoglobin less than 11 g/dl or who are symptomatic, the following baseline investigations are required:

Full blood count

Serum ferritin to assess iron status (plus further evaluation of iron stores if indicated)

Serum C reactive protein (CRP) to assess inflammation.

Further investigations may be warranted, such as vitamin B₁₂, folate, reticulocyte count, serum/urine protein electrophoresis and tests for haemolysis.

Measurement of serum erythropoietin adds no benefit when diagnosing and managing anaemia in chronic kidney disease due to unreliability of the test.

With a normal white cell and platelet count, a peripheral blood film is not indicated as an initial investigation.

Iron deficiency is common in patients with chronic kidney disease and is easily treatable. It may be present despite a normal mean corpuscular volume and normal mean corpuscular haemoglobin, which do not fall until iron deficiency is long standing.

If exogenous erythropoietin therapy were to be commenced, limited or no benefit would be noted in patients with iron deficiency. Therefore serum ferritin should be measured in all patients with anaemia in the context of chronic kidney disease.

Serum lactate dehydrogenase is not indicated as there is no indication of haemolysis from the history.

Urinary 24 hour creatinine clearance may be useful in the assessment of renal disease but will not aid further evaluation of anaemia in this case.



[Q: 1626] OnExamination 2012 - Nephrology

Creatinine has a number of limitations as an estimate of glomerular filtration rate (GFR), including variation with muscle mass and age.

Which of the following answers represents a novel marker of estimating GFR?

- 1- Alpha amyloid protein
- 2- Cystatin c
- 3- Inulin
- 4- Insulin-like growth factor 1 (IGF-1)
- 5- Nystatin

Answer & Comments

Answer: 2- Cystatin c

This question demonstrates knowledge of markers of glomerular filtration rate.

Serum creatinine has limitations as a marker of GFR.

Nystatin is an antifungal agent and not a marker of GFR.

Inulin is a valid marker of renal function and was used experimentally in the past for many years.

Alpha amyloid protein and IGF-1 have no role in estimating renal function.



[Q: 1627] OnExamination 2012 - Nephrology

Which of the following is the best description of the drug cinacalcet?

- 1- Binding phosphate in the gut lumen
- 2- Calcimimetic
- 3- Increasing absorption of calcium from the gut
- 4- Preventing ADH action at the distal collecting duct
- 5- Preventing osteoclast action

Answer & Comments

Answer: 2- Calcimimetic

Cinacalcet is a calcimimetic.

Binding phosphate in the gut lumen is incorrect; this represents the action of phosphate binders.

Increasing absorption of calcium from the gut is incorrect as it represents the action of vitamin D.

Cinacalcet does not have an action of antidiuretic hormone (ADH) and so preventing ADH action at the distal collecting duct is incorrect.

Neither does it affect osteoclasts directly; preventing osteoclast action is wrong as this represents the action of bisphosphonates.



[Q: 1628] OnExamination 2012 - Nephrology

A 60-year-old female is referred to the medical intake with serum potassium of 6.5 mmol/L.

She has a history of type 2 diabetes mellitus, chronic obstructive pulmonary disease (COPD), previous myocardial infarction and osteoarthritis.

Which of the following medications are most likely to contribute to her hyperkalaemia?

- 1- Aspirin
- 2- Clopidogrel
- 3- Insulin glargine
- 4- Lisinopril
- 5- Salbutamol inhaler

Answer & Comments

Answer: 4- Lisinopril

This question requires basic knowledge of medications that can contribute to hyperkalaemia.

Anti-platelet agents themselves are not associated with potassium changes and so options A and B are incorrect.

Insulin (option C) and salbutamol (option E) cause potassium to shift from extra to intracellular compartments and so would not cause a rise in serum potassium.



[Q: 1629] OnExamination 2012 - Nephrology

A 60-year-old female presents with cough, haemoptysis and haematuria.

Her laboratory tests show impaired renal function. After a thorough work up, anti-glomerular basement membrane (anti-GBM)

antibody is positive, diagnosing Goodpasture's syndrome.

Which class of antibody is the anti-GBM most likely to be?

- 1- IgA
- 2- IgD
- 3- IgE
- 4- IgG
- 5- IgM

Answer & Comments

Answer: 4- IgG

Anti-GBM in the Goodpasture's syndrome are rarely due to IgA (option A) and IgM (option E); they are less frequent than IgG.

Hence options A and E are incorrect.

IgD and IgE are not implicated as anti-GBM so both options B and C are incorrect.



[Q: 1630] OnExamination 2012 - Nephrology

Which of the following diabetic medications increases the risk of contrast induced nephropathy?

- 1- Acarbose
- 2- Exenatide
- 3- Gliclazide
- 4- Insulin
- 5- Metformin

Answer & Comments

Answer: 5- Metformin

Contrast induced nephropathy is a complication of intravenous contrast given during some radiological procedures. Existing renal impairment, dehydration and the use of metformin increase the risk of this.

Metformin is usually withheld for 48 hours after the use of contrast.

Option A, acarbose, should not be selected because it is a post-prandial glucose regulator and has no relation to contrast induced nephropathy.

Likewise, options B, C and D are safe to use after the administration of intravenous contrast and do not increase the risk of contrast induced nephropathy.

Reference:

Barrett BJ, Parfrey PS. *Clinical practice. Preventing nephropathy induced by contrast medium. N Engl J Med.* 2006 Jan 26;354(4):379-86



[Q: 1631] OnExamination 2012 - Nephrology

A patient who was recently admitted to the medical receiving unit with general malaise has been found to have deranged renal function. Your registrar asks you to arrange 'an urgent scan' to exclude obstruction of the kidneys.

Which of the following is most appropriate?

- 1- CT KUB (kidneys, ureters and bladder)
- 2- MR angiography of renal tract
- 3- MRI kidneys
- 4- Plain abdominal x ray
- 5- Ultrasound renal tract

Answer & Comments

Answer: 5- Ultrasound renal tract

Acute imaging of the kidneys is intended primarily to exclude obstructive uropathy, which would be demonstrated on ultrasound imaging. Ultrasound imaging is a safe, non-invasive means rapidly to exclude a correctable cause of renal impairment. It is readily available in most hospitals and can be performed by a sonographer or radiologist.

A CT KUB is indicated when the USS (and clinical history) is suggestive of the presence of renal calculi, whether or not they are causing obstruction.

MR imaging of the kidneys can help determine the nature of a lesion seen on ultrasound imaging. It is expensive, time-consuming, and not available in all locations. Furthermore many patients with magnetic materials inserted, for example, pacemakers, defibrillators are precluded from entering the strong magnetic field. These factors preclude its use as a first-line approach to excluding acute obstruction of the kidney.

MR angiography is helpful to exclude renal artery stenosis. This will not confirm or refute the presence of post-renal obstruction.

A plain abdominal x ray will occasionally demonstrate the presence of radio-opaque renal calculi, but cannot confirm or refute the presence of post-renal obstruction. It should not be done routinely in all patients with acute renal impairment unless there is a strong clinical suspicion of renal calculi (in which case most patients will proceed to having a CT KUB examination).



[Q: 1632] OnExamination 2012 - Nephrology

A 44-year-old woman with type 1 diabetes mellitus has not attended the diabetic clinic for five years.

Examination shows no abnormalities.

Investigations show:

Haemoglobin 9 g/dL (11.5-16.5)

MCV 94 fL (80-96)

Haematocrit 28%

HbA1c 10.1% (3.8-6.4)

A blood smear shows normochromic, normocytic anaemia.

Which of the following is the most likely cause?

- 1- Acute blood loss
- 2- Chronic lymphocytic leukaemia (CLL)
- 3- Erythropoietin deficiency
- 4- Microangiopathic haemolysis
- 5- Sideroblastic anaemia

Answer & Comments

Answer: 3- Erythropoietin deficiency

The most likely cause is progressive renal failure which leads to reduced release of erythropoietin from the kidneys.

Sideroblastic anaemia (myelodysplasia) is seen in older age groups.

CLL or microangiopathic haemolysis are possible causes but unlikely.



[Q: 1633] OnExamination 2012 - Nephrology

Patients with end stage renal failure on haemodialysis may have anaemia secondary to multiple causes.

One important cause is erythropoietin (EPO) deficiency. EPO injections can be given intravenously or subcutaneously and are effective, providing that iron stores are replete.

Which of the following blood tests in conjunction with serum ferritin is the recommended test for iron status in patients with anaemia?

- 1- C reactive protein (CRP)
- 2- Erythrocyte sedimentation rate (ESR)
- 3- Mean cell volume
- 4- Serum iron
- 5- Transferrin saturation

Answer & Comments

Answer: 5- Transferrin saturation

According to NICE guidelines, ferritin in conjunction with either transferrin saturation or percentage hypochromic red cells is used to assess anaemia.

Low mean cell volume (option C) can be indicative of iron deficiency but may also be attributable to other causes and so this is incorrect.

Option D, although a marker of iron status is not a recommended test, is incorrect.

Options A and B are inflammatory markers and have no bearing on the management of iron status in anaemia in chronic kidney disease. Hence these are incorrect.

Reference:

Anaemia Management in People with Chronic Kidney Disease. NICE Quick Reference Guide February 2011



[Q: 1634] OnExamination 2012 - Nephrology

A 30-year-old woman receives a cadaveric renal transplantation after having had renal failure, with a neuropathic bladder for which she performed intermittent self-catheterisation.

Six months after transplantation she presents with acute pain in the region of the transplanted kidney.

Which one of the following is the most likely reason for the pain?

- 1- Acute retention of urine
- 2- Allograft rejection
- 3- Pyelonephritis
- 4- Renal calculi
- 5- Renal infarction

Answer & Comments

Answer: 3- Pyelonephritis

Acute urinary retention would not cause pain overlying a transplanted kidney, and as this

lady self-catheterises, it would be an unlikely occurrence.

Due to the elapsed time between the transplant and this episode, allograft rejection can be discounted. This is because chronic rejection (more than three months post transplant) is a painless process, with difficult to control hypertension, proteinuria and slowly rising serum creatinine.

Accelerated rejection (one to five days post transplant) can present with fever, an acutely tender swollen graft, and rapidly rising serum creatinine.

Acute rejection (five days to three months) is clinically silent in the majority, but can present with a swollen, tender kidney.

Renal infarction can also be discounted. This can be a surgical complication of renal transplantation, but it presents early with a calyceal fistula and urinary leak.

Renal stones could cause acute pain in the region of a transplanted kidney, but would be less likely in this patient than acute retention of urine.

The answer in this case is acute pyelonephritis.

This patient is in the intermediate stage of the post-transplantation immunosuppression, when the patient is most immunocompromised (three to six months post-transplant).

She is at high risk of an acute episode of pyelonephritis in the transplanted kidney, due to the immunosuppression, the neuropathic bladder and self-catheterisation. This would present like an acute rejection episode, with a tender swollen graft, low-grade pyrexia, and deteriorating graft function.

This would be commonly associated with septicaemia in this patient, and requires parenteral antibiotics.

If this lady were to be managed as a transplant rejection, with high dose intravenous steroids, the result could be catastrophic.



[Q: 1635] OnExamination 2012 - Nephrology

A 22-year-old woman presents with right loin pain, oliguria and coke-coloured urine.

Blood pressure is increased at 160/70 mmHg and urinary dipstick shows protein ++++ and blood +++. Microscopy is awaited.

Blood tests reveal:

Hb 12.6 (11.5 - 16.5 g/dL)

WCC 8.4 (4 - 11 x 10⁹/L)

Platelets 412 (150 - 400 x 10⁹/L)

Na 137 (137 - 144 mmol/L)

K 5.7 (3.5 - 4.9 mmol/L)

Creatinine 263 (60 - 110 µmol/L)

Urea 25.2 (2.5 - 7.5 mmol/L)

What is the most appropriate next investigation of this patient?

- 1- Renal angiography
- 2- DMSA scan
- 3- Plain abdominal KUB
- 4- Renal biopsy
- 5- Renal ultrasound scan

Answer & Comments

Answer: 5- Renal ultrasound scan

Although this patient has features of nephritic syndrome and may warrant biopsy in the future, a renal ultrasound scan is the best next investigation.

Renal ultrasound allows one to assess kidney size, the presence of hydronephrosis, cysts or tumours and any developmental abnormalities. Doppler traces also allow renal blood flow to be assessed.

If a clear identifiable precipitant is identified as the cause of the acute kidney injury an ultrasound may not be appropriate.

If a patient is in acute urinary retention and their creatinine falls spontaneously with insertion of a catheter, they do not necessarily need an ultrasound.

If a patient has had an insult such as profound hypotension, or has AKI in the context of sepsis with a previously normal creatinine, an ultrasound will not add much to the diagnosis unless they fail to recover with time.

However, the above patient warrants ultrasound imaging.

- A. Angiography is not indicated for this patient.
- B. A DMSA scan is not indicated for this patient.
- C. A plain abdominal KUB is less frequently used compared to a CT KUB for stone disease, however this patient has nephritis.
- D. A renal biopsy may be indicated in the future, but an ultrasound should be performed first.
- E. A renal ultrasound scan should be performed in all patients with acute kidney injury, unless a clear treatable cause is identified.



[Q: 1636] OnExamination 2012 - Nephrology

A 66-year-old gentleman is admitted with an exacerbation of chronic congestive heart failure and is treated with intravenous diuretics.

His serum potassium results are shown below.

Admission:

Serum Potassium 4 mmol/L(3.5 - 5.0)

Day 3 of admission:

Serum Potassium 3 mmol/L(3.5 - 5.0)

Which is the best estimate of the total body potassium loss of this patient since admission?

- 1- 1 mmol
- 2- 10 mmol
- 3- 50 mmol
- 4- 75 mmol
- 5- 200 mmol

Answer & Comments

Answer: 5- 200 mmol

This question highlights the importance of potassium distribution within the body. It is a predominantly intracellular ion.

Small reductions in serum potassium are associated with relatively large reductions in total body potassium.

Options A to D are under-estimates of total body potassium and therefore are incorrect and should not be selected.

There is no exact formula to derive the 200mmol. The candidates should recognise that potassium is mainly an intracellular ion (about 95% is intracellular). An approximation for total body loss for potassium is that a drop in 1mmol/L K⁺ of serum potassium is approximately equivalent to a 200mmol K⁺ total body loss. Can I stress that this is an approximation. Given that 200mmol is an approximate calculation, the other options are deliberately chosen to be clearly incorrect (the next highest value being 75 mmol). This question should correlate with clinical experience. It is rare that a large drop in potassium can be corrected with a few tablets with oral potassium and often intravenous replacement at higher doses are required.

Reference:

Gennari FJ. Hypokalaemia. *N Engl J Med.* 1998 Aug 13;339(7):451-8.



[Q: 1637] OnExamination 2012 -
Nephrology

A 50-year-old lady is referred to the renal team with progressive renal impairment and for consideration of renal replacement therapy in the future.

She has a history of type 1 diabetes mellitus (DM) since her teens. Her ultrasound scan shows normally sized kidneys and her urine dip is positive for protein. A renal biopsy is undertaken.

Which of the following findings would be diagnostic of diabetic related kidney injury?

- 1- C4d stain positive
- 2- Congo red stain positive
- 3- Kimmelstiel-Wilson lesion
- 4- Owl's eyes inclusion
- 5- Ring sideroblasts

Answer & Comments

Answer: 3- Kimmelstiel-Wilson lesion

Option C should be selected as it is the only biopsy finding that is specific to diabetic related kidney disease.

Option A is wrong as C4d staining is used for detection of BK virus after renal transplantation.

Congo red stain (option B) should not be selected as this is used to detect amyloidosis.

Option D depicts the biopsy appearance of the Reed-Sternberg cell in Hodgkin's lymphoma or cytomegalovirus (CMV) infection so this is incorrect.

Ring sideroblasts (option E) are peripheral blood film findings in lead toxicity so this is incorrect.



[Q: 1638] OnExamination 2012 -
Nephrology

A 34-year-old man presents with worsening

shortness of breath, wheeze, lethargy and nausea. He has a history of asthma which has been managed by one of your partners with salbutamol and a twice daily combination of a long acting beta-2 agonist and an inhaled steroid inhaler.

On examination his BP is 150/92 mmHg, his pulse is 80 and regular. He has extensive wheeze throughout both lung fields.

Investigations show

Haemoglobin 11.8 g/dl(13.5-18)

White cell count $10.1 \times 10^9/L$

(Eosinophils 30%) (4-10)

Platelets $190 \times 10^9/L$ (150-400)

Sodium 140 mmol/l (134-143)

Potassium 4.9 mmol/l (3.5-5)

Creatinine 189 $\mu\text{mol/l}$ (60-120)

ESR 62 (<10)

Urine Blood++

Protein ++

Which of the following is the most likely diagnosis?

- 1- Alport's syndrome
- 2- Churg-Strauss syndrome
- 3- IgA nephropathy
- 4- Post-streptococcal glomerulonephritis
- 5- Wegener's granulomatosis

Answer & Comments

Answer: 2- Churg-Strauss syndrome



[Q: 1639] OnExamination 2012 -
Nephrology

A 52-year-old man has been referred to the outpatient clinic due to deteriorating renal function.

A diagnosis of adult polycystic kidney disease (APKD) is made.

His family history reveals that his mother died of a stroke at the age of 50, and that his father is still alive. He is concerned regarding the inheritance of the disorder.

What is the probability that his son will inherit it?

- 1- 0%
- 2- 25%
- 3- 50%
- 4- 75%
- 5- 100%

Answer & Comments

Answer: 3- 50%

APKD is an autosomal dominant condition and typically presents between the ages of 30-50.

Patients develop deteriorating renal function and associated hypertension.

As well as renal cysts, they may also have hepatic and berry aneurysms (maternal history may be highly relevant here).

The chance of passing this condition to his son is 50%.



[Q: 1640] OnExamination 2012 - Nephrology

A 30-year-old male presents with oedema and proteinuria.

On examination his blood pressure was 120/70 mmHg.

Investigations reveal:

Creatinine 88 µmol/L (60-110)

Albumin 25 g/L (37-49)

Urinalysis No blood

Protein++++

Urinary protein excretion 7g/24hr (<0.2)

Ultrasound of renal tract: normal right kidney, absent left kidney.

Which is the most appropriate course of action for this patient?

- 1- Albumin transfusion
- 2- Angiotensin converting enzyme (ACE) inhibitor therapy
- 3- High protein diet
- 4- Renal biopsy
- 5- Trial of steroid therapy

Answer & Comments

Answer: 5- Trial of steroid therapy

This patient has nephrotic syndrome, which is a combination of:

Proteinuria (usually > 3g/24 hrs)

Hypoalbuminaemia (<35g/L)

Oedema

Hyperlipidaemia.

The most appropriate course of action here would be to undergo a trial of steroid therapy.

Ideally a renal biopsy would be indicated to determine the cause of the nephrotic syndrome, however as this patient only has one kidney then this would be considered a relative contraindication for such a procedure.

A high protein diet / albumin transfusion would be of little to no benefit - and the latter would need to be salt poor.

ACE inhibitors reduce proteinuria and slow deterioration in glomerular filtration rate (GFR).

In this case given the patient's age he may well have minimal change glomerulonephritis (GN) (commonest in children), which is normally steroid responsive.

In the young adult histological diagnoses are in general: minimal change > mesangiocapillary > FSGS > lupus > membranous > diabetes.

In general steroids are tried first and then second line agents such as cyclosporin and cyclophosphamide are introduced if needed.



[Q: 1641] OnExamination 2012 - Nephrology

A 50-year-old female presents with acute chest pain and dyspnoea.

Examination reveals bilateral ankle oedema with 24 hour urine protein assessment showing 8g/d (<0.2).

Which is the most likely explanation for these findings?

- 1- Factor V Leiden
- 2- Reduced antithrombin III activity
- 3- Reduced concentration of von Willebrand's factor
- 4- Reduced factor VIII
- 5- Reduced fibrinogen concentration

Answer & Comments

Answer: 2- Reduced antithrombin III activity

This patient has developed nephrotic syndrome and appears to have had a thromboembolic event.

The suggestion is that she has had nephritic syndrome before developing the thromboembolism.

Deranged coagulation associated with nephrotic syndrome is a consequence of AT III deficiency, increased fibrinogen and increased factor VIIIc.



[Q: 1642] OnExamination 2012 - Nephrology

Which of the following is a recognised cause of acute renal failure in childhood?

- 1- Alport syndrome
- 2- Burns
- 3- Dermatomyocytis

- 4- Duchenne muscular dystrophy
- 5- Hypothyroidism

Answer & Comments

Answer: 2- Burns

Causes of acute renal failure can be divided into pre-renal, renal and post-renal.

Pre-renal:

Hypovolaemia (gastroenteritis, burns, sepsis, haemorrhage, nephrotic syndrome)

Circulatory failure.

Renal:

Vascular: HUS, vasculitis, embolus, renal vein thrombosis

Tubular: acute tubular necrosis, ischaemic, toxic, obstructive

Glomerular: glomerulonephritis

Interstitial: interstitial nephritis, pyelonephritis

Acute chronic renal failure.

Post-renal:

Obstruction, either congenital or acquired.

Although Alport syndrome is associated with end stage renal failure, this usually progresses gradually so that it occurs in adult life.

Many drugs cause interstitial nephritis.



[Q: 1643] OnExamination 2012 - Nephrology

Which of the following features would be expected in acute tubular necrosis?

- 1- Creatinine clearance would be expected to be normal one year after the initial insult
- 2- Heavy proteinuria on urinalysis
- 3- Red cell casts on urinalysis
- 4- Urine plasma osmolality ratio is more than 1:1

5- Urine sodium concentration greater than 30 mmol/l

Answer & Comments

Answer: 5- Urine sodium concentration greater than 30 mmol/l

Red cell casts suggest nephritis and normalisation of the creatinine clearance occurs in only 40% of cases one year later.

Proteinuria, usually mild, is common with granular casts found on urinalysis.

The urine sodium concentration is typically above 30 mmol/l and osmolality ratio <1:1.



[Q: 1644] OnExamination 2012 - Nephrology

In which of the following patients is an ACE inhibitor contraindicated?

- 1- A 24-year-old woman with type 1 diabetes and microalbuminuria, who wants to start a family
- 2- A 28-year-old woman with reflux nephropathy and hypertension
- 3- A 34-year-old man with essential hypertension and a BMI of 32
- 4- A 34-year-old woman with hypertension and a horseshoe kidney
- 5- A 62-year-old type 2 diabetes patient who has microalbuminuria and a stable creatinine of 210

Answer & Comments

Answer: 1- A 24-year-old woman with type 1 diabetes and microalbuminuria, who wants to start a family

ACE inhibitors are contraindicated in pregnancy. There is an increase in congenital cardiac and neurological abnormalities; and despite the fact this woman has microalbuminuria, use of an ACE inhibitor is not recommended.

In patients with elevated creatinine and microalbuminuria, use of an ACE inhibitor is still a reasonable option, as it has been proven to delay both further deterioration of creatinine and worsening albuminuria.

With respect to essential hypertension and a raised BMI, an ACE inhibitor may be appropriate; other options include a calcium antagonist.

Regarding β -blockers and thiazides, evidence suggests they may increase insulin resistance and risk of diabetes, hence you may choose to avoid them here.

Other contraindications to ACE inhibition include:

- Angio-oedema
- Breast feeding
- Significant renal artery stenosis.

Reference:

New England Journal of Medicine 2006 354:2443-2451



[Q: 1645] OnExamination 2012 - Nephrology

A 63-year-old male recently admitted with sepsis is noted to have a urine output of approximately 20 mls per hour.

The oliguria is more likely to be due to prerenal failure than intrinsic renal failure if which of the following is correct?

- 1- A blood pressure of 150/90 and good tissue perfusion.
- 2- A urine free of red blood cells or casts
- 3- A urine:plasma urea ratio <3
- 4- Urine osmolality <350 mOsm/l
- 5- Urinary sodium >10mmol/l

Answer & Comments

Answer: 2- A urine free of red blood cells or casts

Oliguria is defined as < 400 ml urine/day.

Red cell casts present in:

- Acute glomerulonephritis
- Renal vasculitis
- Accelerated hypertension
- Interstitial nephritis.

Pre-renal failure is renal dysfunction due to hypoperfusion (urinary sodium <20 , urine osmolality >500 , urine/plasma ratio >8 , and urine/plasma creatinine >40).

Acute tubular necrosis is acute renal failure due to circulatory compromise and/or nephrotoxins (urinary sodium >40 , urine osmolality <350 , urine/plasma ratio <3 , and urine/plasma creatinine <20).



[Q: 1646] OnExamination 2012 - Nephrology

A 35-year-old gentleman attends the renal clinic with weight gain and shortness of breath.

Laboratory results show a low albumin, raised cholesterol and urine dipstick shows 3+ protein.

What is the minimum value of protein:creatinine ratio that would be classed as 'nephrotic range' from the answers below?

- 1- 50 mg/mmol
- 2- 100 mg/mmol
- 3- 200 mg/mmol
- 4- 250 mg/mmol
- 5- 300 mg/mmol

Answer & Comments

Answer: 5- 300 mg/mmol

The triad of proteinuria, hypoalbuminaemia and oedema typifies the nephrotic syndrome.

The minimum threshold for proteinuria which is defined as 'nephrotic' is 300 mg/mmol. Hence options A, B, C and D which are below

this level are incorrect and should not be selected.

Reference:

Hull RP, Goldsmith DJ. Nephrotic Syndrome in adults. BMJ. 2008 May 24;336(7654):1185-9



[Q: 1647] OnExamination 2012 - Nephrology

A 17-year-old woman underwent a renal transplant. She was concerned about the effects of long-term ciclosporin treatment.

Which one of the following is a common adverse effect of this drug?

- 1- Alopecia
- 2- Bone marrow depression
- 3- Hepatotoxicity
- 4- Nephrotoxicity
- 5- Paraesthesia

Answer & Comments

Answer: 4- Nephrotoxicity

Ciclosporin causes hypertrichosis rather than alopecia and the most frequent adverse side effect of this drug is nephrotoxicity.

Post renal transplant, the two most common causes of declining renal function are graft rejection and ciclosporin toxicity.

Hepatotoxicity and paraesthesia are less common side effects of the drug.



[Q: 1648] OnExamination 2012 - Nephrology

A 32-year-old male is referred with chronic renal dysfunction and is discovered to have adult polycystic kidney disease (APKD).

His blood pressure is consistently 140-150/90 mmHg.

Which of the following antihypertensives is the most appropriate for the management of this man's blood pressure?

- 1- ACE inhibitor
- 2- Betablocker
- 3- Calcium channel blocker
- 4- Diuretic
- 5- Moxonidine

Answer & Comments

Answer: 1- ACE inhibitor

Autosomal dominant APKD-1 is a relatively common disorder accounting for approximately 8% of cases of end-stage renal disease (ESRD).

"The best drugs for this condition are ACE inhibitors (ie, captopril, enalapril, lisinopril) or angiotensin II receptor antagonist blockers (ie, telmisartan, losartan, irbesartan, candesartan). Calcium channel blockers are not encouraged to be used."

However, although widely used and recommended, there is no evidence that the renin-angiotensin system is affected in the disease.



[Q: 1649] OnExamination 2012 - Nephrology

A 28-year-old female is referred with a three month history of tiredness and weakness.

On examination, pulse is 82 bpm and blood pressure is 128/72 mmHg. No specific abnormalities are evident on examination of the cardiovascular, respiratory, abdominal or neurological systems.

Investigations reveal:

Serum Sodium 142 mmol/l (137-144)

Serum Potassium 3.0 mmol/l (3.5-4.9)

Serum urea 4.2 mmol/l (2.5-7.5)

Serum creatinine 82 µmol/l (60-110)

Serum chloride 73 mmol/l (95-107)

Plasma glucose 5.5 mmol/l (3.0-6.0)

Urinary chloride 60 mmol/l (20-350)

Which of the following is the likely diagnosis?

- 1- Bartter's syndrome
- 2- Conn's syndrome
- 3- Drug ingestion
- 4- Liddle's syndrome
- 5- Non-classical congenital adrenal hyperplasia (CAH)

Answer & Comments

Answer: 3- Drug ingestion

This young woman has hypokalaemia and hypochloraemia.

The normal blood pressure would exclude a diagnosis of Conn's, CAH, or Liddle's syndrome (apparent mineralocorticoid excess). Similarly, drug ingestion associated with hypokalaemia liquorice/carbenoxolone is associated with hypertension (and low urinary chloride less than 20 mmol/l).

Bartter's syndrome is a rare, recessive condition associated with weakness, lethargy and growth retardation and is found in youngsters. Hypokalaemic hypochloraemic alkalosis is seen in the condition but symptoms would be more apparent at a much younger age than this woman.

If Gitelman's syndrome were offered then that would be a better option.

Therefore the most likely diagnosis as the symptoms have arisen only over the last three months and no other features are apparent on examination, is diuretic abuse.



[Q: 1650] OnExamination 2012 - Nephrology

A 16-year-old female presents with ankle swelling four days after having had a sore throat. On examination she had a blood pressure of 125/80 mmHg and ankle oedema. Investigations reveal:

Creatinine 90 µmol/l (60-110)

Albumin 25 g/l (37-49)

24 hour urinary protein 9 g(<0.2)

What is the most likely diagnosis?

- 1- Idiopathic membranous nephropathy
- 2- IgA nephropathy
- 3- Membranoproliferative glomerulonephritis
- 4- Minimal change nephropathy
- 5- Post-streptococcal glomerulonephritis

Answer & Comments

Answer: 2- IgA nephropathy

Idiopathic membranous nephropathy (option A) accounts for 2-5% of cases of nephritic syndrome in children, and 20-30% of cases in adults.

The immune mechanism that leads to the development of membranous nephropathy is unknown. Histologically, it is characterised by diffuse thickening of the glomerular basement membrane (GBM) on light microscopy. On immunofluorescence, the thickening is caused by immune deposits of IgG and C3, on the subepithelial surface of the GBM.

When not idiopathic, it is associated with:

- AI diseases (SLE, rheumatoid arthritis, thyroid disease)
- drugs (gold, penicillamine, captopril)
- malignancy (bronchus, breast, stomach, colon, prostate)
- infections (hep B, syphilis, leprosy, filariasis)
- diabetes mellitus.

Membranoproliferative (or mesangiocapillary) glomerulonephritis (option C) can be classed into three types (I, II, and III) depending on which complement pathway is activated. It is associated with SLE, cryoglobulinaemia with or without hep C, chronic infections (SBE) or with neoplasms. It is not associated acutely with upper respiratory tract infections.

Minimal change nephropathy (option D) is the most common form of nephrotic syndrome in children. The histological findings on light microscopy are normal or small looking glomeruli. On electron microscopy there is effacement of the epithelial cell foot processes over the outer surface of the GBM. It tends to be steroid responsive in children, but over 60% of children will have further relapses. In adults, it is associated with Hodgkin's lymphoma, and other carcinomas.

Post streptococcal GN (option E), as the name implies, occurs 10-14 days after an acute infection. The typical case occurs following infection with group A Lancefield streptococci (β -haemolytic strep, *S. pyogenes*) either causing pharyngitis or skin infections. It is more common in the developing world. The histology shows diffuse proliferative GN, with infiltration by neutrophil polymorphs. The main treatment is eradication of the infection (10/7 course of penicillin) and symptomatic relief of the acute nephritis. The need for dialysis is uncommon, and complete recovery of renal function should occur.

The correct answer is IgA nephritis (option B). IgA nephritis is most common during the second and third decade of life. It commonly occurs within two days of an onset of an upper respiratory tract infection, or less commonly infection of other mucous membranes (e.g. GI, bladder, breast). It should be diagnosed by a renal biopsy, where IgA is seen deposited in the mesangium.

The treatment of IgA nephritis is variable. In a patient with haematuria only, the treatment is conservative. When there is nephrotic range proteinuria (>3 g/day - as in this case) an 8-12 week course of prednisolone should be prescribed. If the proteinuria is <3 g/day an ACE inhibitor can be used. In all patients, careful control of blood pressure should be achieved, by using ACE inhibitors in the first instance, and regular follow up of renal function and urinalysis.

30% of children will have a spontaneous remission within 10 years, but 25% will go on to develop ESRF within 20 years.



[Q: 1651] OnExamination 2012 - Nephrology

An 81-year-old man was admitted with renal failure due to benign prostatic hypertrophy.

His bladder was drained with an urethral catheter followed by a diuresis of more than 3L per day. After two days he became progressively drowsy.

What is the most likely cause for his reduced level of consciousness?

- 1- Hyperglycaemia
- 2- Hypocalcaemia
- 3- Hypomagnesaemia
- 4- Hyponatraemia
- 5- Metabolic acidosis

Answer & Comments

Answer: 4- Hyponatraemia

Amelioration of urinary obstruction and subsequent recovery initially results in a large electrolyte and water loss.

Osmotic cerebral changes precipitated by urinary sodium loss, the major intravascular cation, is the cause of drowsiness.

Hypocalcaemia and hypomagnesaemia may occur as tubular reabsorption is suboptimal in the early stages of recovery, but is unlikely to affect conscious level. Acid-base status should improve after relief of the obstruction.

Hyperglycaemia is not a common complication of recovery from obstructive uropathy.



[Q: 1652] OnExamination 2012 - Nephrology

A 19-year-old female developed pleural effusions, ascites and ankle swelling. Her

blood pressure was 112/76 mmHg.

Investigations revealed:

Serum alanine transferase 17 U/L (5 - 15)

Serum total bilirubin 17 umol/L (1 - 22)

Serum Albumin 21 g/L (34 - 94)

Serum total cholesterol 9.8 mmol/L (<5.2)

What is the next most appropriate investigation?

- 1- Antinuclear antibody
- 2- Pregnancy test
- 3- Prothrombin time
- 4- Serum protein electrophoresis
- 5- Urinary protein estimation

Answer & Comments

Answer: 5- Urinary protein estimation

The low albumin and elevated cholesterol would suggest nephrotic syndrome (more than 4 gram protein/24 hour urine).

Other complications of nephrotic syndrome include:

- Susceptibility to infection
- Thromboses
- Renal failure and
- Protein malnutrition.

The normal BP makes pre-eclampsia unlikely. Besides, the hypercholesterolaemia is the big clue.



[Q: 1653] OnExamination 2012 - Nephrology

A 49-year-old woman has been an inpatient for the past 10 days for treatment of a bronchopneumonia. She has developed the onset of chills, fever, and skin rash over the past two days.

A peripheral blood film reveals eosinophilia. On urinalysis she has ++ proteinuria. There is

no past history of renal disease. Her haemoglobin A1C is normal.

Which of the following diagnoses would be most strongly suggested by these findings?

- 1- Acute serum sickness
- 2- Acute tubular necrosis
- 3- Drug-induced interstitial nephritis
- 4- IgA nephropathy
- 5- Post-streptococcal glomerulonephritis (GN)

Answer & Comments

Answer: 3- Drug-induced interstitial nephritis

The findings are typical of a drug-induced acute interstitial nephritis.

Post-streptococcal GN appears weeks after the acute infection.

Berger's disease (IgA nephropathy) is characterised by haematuria and often follows a 'flu-like' illness.

Eosinophilia is not typical for serum sickness.



[Q: 1654] OnExamination 2012 - Nephrology

Which one of the following is true concerning antidiuretic hormone (ADH)?

- 1- Carbamazepine potentiates its release
- 2- Ethanol potentiates its release
- 3- It circulates in the blood bound to neurohypophysin
- 4- It is a cyclic octapeptide
- 5- It is synthesised in the posterior pituitary

Answer & Comments

Answer: 1- Carbamazepine potentiates its release

ADH is a nonapeptide manufactured in the paraventricular and supra-optic nuclei of the

hypothalamus and released from the posterior pituitary.

It acts on the collecting ducts improving water permeability and hence water retention.

Carbamazepine as well as other agents such as thiazides and selective serotonin reuptake inhibitors (SSRIs) may potentiate its release.

Ethanol usually inhibits release.

Reference:

<http://acbrown.com/kidney/Lectures/RnWatr/RnWatrAntiTrmn.htm>



[Q: 1655] OnExamination 2012 - Nephrology

A 15-year-old girl was seen by her family physician because of increasing lethargy. She had a recent history of the 'flu'.

Biochemistry tests show that she has renal impairment.

Investigations show:

Serum Sodium 140 mmol/L (137-144)

Serum Potassium 4.2 mmol/L (3.5-4.9)

Serum Urea 28 mmol/L (2.5-7.5)

Serum Creatinine 280 µmol/L (60-110)

Her condition does not improve after several weeks on corticosteroid therapy, so a renal biopsy is performed. The biopsy demonstrates the presence of segmental sclerosis of 3 of 10 glomeruli identified in the biopsy specimen.

Immunofluorescence studies and electron microscopy do not reveal evidence for immune deposits.

What is the most appropriate advice to give regarding her condition?

- 1- She has an underlying malignancy
- 2- She may require a renal transplant in 10 years
- 3- She will improve if she loses weight
- 4- She will likely develop a restrictive lung disease

- 5- She will probably improve with additional corticosteroid therapy

Answer & Comments

Answer: 2- She may require a renal transplant in 10 years

The findings in this case point to focal segmental glomerulosclerosis (FSGS). This accounts for approximately 20% of cases of nephrotic syndrome in children and 40% in adults. It is one of the most common primary glomerular disorders causing end-stage renal failure.

Proteinuria is the classic clinical feature, and is typically accompanied by hypoalbuminaemia, hypercholesterolaemia and peripheral oedema. The cardinal feature on renal biopsy is progressive glomerular scarring. Early in the disease course, glomerulosclerosis involves a minority of glomeruli (focal) and only a portion of the glomerular globe (segmental). As the disease progresses more widespread glomerulosclerosis develops. This is due to podocyte injury which leads to effacement of the podocyte foot processes.

80% of causes of FSGS are idiopathic, thought to be mediated by circulating permeability factors. Secondary forms can be familial (due to mutations in specific podocyte genes), viral (HIV-1, parovirus B19, CMV, EBV), drug-induced (heroin, IFN, lithium, pamidronate, anabolic steroids, calcineurin inhibitors), or adaptive (unilateral renal agenesis, hypertension, sickle cell anaemia, vaso-occlusion).

Treatment is aimed at preserving renal function, and inducing remission of proteinuria. Secondary causes should be excluded, as treatment should be targeted at the underlying condition in these cases. Idiopathic cases are treated with renin-angiotensin blockade and dietary sodium restriction initially. If nephrotic syndrome is present, high-dose glucocorticoid therapy

should be initiated and slowly tapered over a period of 3-6 months if a response is seen. If FSGS is glucocorticoid resistant, therapy is with a calcineurin inhibitor.

A significant number of patients with FSGS go on to end-stage renal failure (ESRF). Unfortunately, FSGS recurs in 40% of renal transplants. Risk factors for recurrence include age 6-15y, Caucasian, rapid course to ESRF (<3y), heavy proteinuria prior to transplantation and previous allograft loss. Plasmapheresis has been showed to lead to remission, if used early in the course of recurrence.



[Q: 1656] OnExamination 2012 -
Cardiology

A 55-year-old man presented to the Emergency department with sudden breathlessness.

He is sweaty and obviously short of breath. He is a smoker with a past history of hypertension. There are crackles on inspiration at both his lung bases and his CXR shows upper lobe venous diversion and perihilar shadowing.

His ECG shows sinus tachycardia only and his cardiac enzymes, when they return the next day, are normal. His symptoms resolved quickly with oxygen and furosemide.

Which of the following conditions is the most likely explanation of this presentation?

- 1- Hypertrophic obstructive cardiomyopathy
- 2- Myocardial infarction
- 3- Pheochromocytoma
- 4- Pulmonary embolism
- 5- Renal artery stenosis

Answer & Comments

Answer: 5- Renal artery stenosis

Flash pulmonary oedema in someone with a history of hypertension, especially those suspected of being arteriopathies such as smokers, should raise the possibility of renal artery stenosis.



[Q: 1657] OnExamination 2012 -
Cardiology

Which of the following lipid abnormalities are most likely to be detected in a patient with type 2 diabetes?

- 1- Elevated HDL concentrations
- 2- Elevated LDL concentrations
- 3- Large buoyant LDL molecules
- 4- Reduced triglyceride concentrations

5- Small dense LDL molecules

Answer & Comments

Answer: 5- Small dense LDL molecules

In type 2 diabetes increased cholesteryl ester transfer protein (CETP) activity results in the transfer of triglycerides from very low-density lipoprotein (VLDL) to high-density lipoprotein (HDL) and low-density lipoprotein (LDL).

This results in small dense LDL which is more atherogenic being able to be oxidised more readily and penetrate endothelium and macrophages.

LDL is not typically elevated in type 2 diabetes although there are qualitative changes as indicated above.

HDL is typically low in the patient with type 2 diabetes.

Triglycerides are often elevated with poor glycaemic control.



[Q: 1658] OnExamination 2012 -
Cardiology

A 65-year-old man is admitted to the coronary care unit with an acute inferior myocardial infarction (MI). There are no contraindications to thrombolysis and he receives streptokinase with good resolution of ECG changes.

Three days later examination is normal, with a blood pressure of 134/76 mmHg. Results reveal a total cholesterol of 4.8 mmol/l (<5.2).

Which one of the following drugs does not have good evidence for reducing future morbidity and mortality?

- 1- Aspirin
- 2- Atenolol
- 3- Nifedipine
- 4- Ramipril
- 5- Simvastatin

Answer & Comments

Answer: 3- Nifedipine

Aspirin leads to a 12% reduced risk of death and 31% reduced risk of reinfarction in evidence reviewed by the antiplatelet therapy trialists and also GISSI studies.

Several trials have demonstrated benefit from long term treatment with β -blockers, by reducing the incidence of recurrent MI, and death from all causes.

Numerous trials have shown benefit from angiotensin converting enzyme (ACE) inhibitor therapy post MI in those with and without evidence of left ventricular impairment.

The 4S (Scandinavian Simvastatin Survival Study) demonstrated a benefit from lowering cholesterol with simvastatin in patients with coronary disease.

There is no evidence to support a beneficial effect of nifedipine post- MI.



[Q: 1659] OnExamination 2012 - Cardiology

A 60-year-old man with diabetes presents to clinic for advice on prevention of a further heart attack after having sustained a myocardial infarction five years previously.

He takes metformin 500 mg tds, bendroflumethiazide 2.5 mg daily and aspirin 150 mg daily. His body mass index was 33.5 kg/m², with a pulse of 82 beats per minute regular and a blood pressure of 152/92 mmHg. His cholesterol concentration is 3.3 mmol/l (<5.5).

What is the most appropriate strategy for this patient?

- 1- 24 hour ambulatory ECG
- 2- Atorvastatin
- 3- Increase aspirin from 150 mg to 300 mg daily
- 4- Orlistat

5- Ramipril

Answer & Comments

Answer: 5- Ramipril

The most appropriate strategy for secondary prevention would involve further blood pressure reduction with an angiotensin converting enzyme inhibitor (ACEi), which would not only reduce cardiovascular (CV) risk as suggested by the HOPE study but also reduce microvascular risk as revealed by UKPDS.

The NCEP ATPIII criteria suggest a cholesterol less than 4, but this patient already has a low cholesterol and would not benefit as much from the addition of a statin.

The increase of aspirin from 150 to 300 mg would offer no added advantage.

Orlistat is used under specific criteria for weight reduction and has, as yet, not been shown to reduce CV risk in type 2 diabetes mellitus (T2DM).

There is no reason here for a 24 hour tape.



[Q: 1660] OnExamination 2012 - Cardiology

In a patient presenting with aortic stenosis (AS), *which of the following findings would be most helpful in establishing a diagnosis of congenital bicuspid valve as the aetiology?*

- 1- Age
- 2- Calcified leaflets
- 3- Commissural fusion on ECHO
- 4- Negative history for rheumatic fever
- 5- Systolic ejection click

Answer & Comments

Answer: 5- Systolic ejection click

Age and calcified aortic root suggest calcific aortic valvular disease.

Rheumatic AS results from fibrosis of the leaflets and fusion of the commissures.

An ejection click or ejection sound, best heard at the apex, implies that the site of the stenosis is mostly valvular and of congenital origin, that is, bicuspid valvular disease.



[Q: 1661] OnExamination 2012 - Cardiology

A patient presents with atrial fibrillation which later reverts to sinus rhythm.

In which of the following circumstances is the patient more likely to remain in sinus rhythm?

- 1- Age more than 75-years-old
- 2- Been commenced on warfarin
- 3- Left atrium size greater than 6 cm on ECHO
- 4- Short history of AF
- 5- Ventricular rate on presentation of 130 bpm

Answer & Comments

Answer: 4- Short history of AF

The patient with very recent onset of atrial fibrillation is more likely to stay in sinus rhythm.

Atrial fibrillation in older patients is more likely to be associated with structural heart disease.

Anticoagulation should have no effect on the risk of paroxysmal atrial fibrillation.

An enlarged left atrium is unlikely to remain in sinus rhythm.

Those presenting with a relatively slow ventricular rate and, especially if they are not on β -blockers, calcium antagonists or digoxin, are likely to have chronic atrial fibrillation.



[Q: 1662] OnExamination 2012 - Cardiology

A 52-year-old sales representative is admitted

with an inferior myocardial infarction (MI). He receives thrombolysis and makes an uneventful recovery.

He is discharged on atenolol, aspirin and atorvastatin.

He enquires how long after his MI must he wait before he is able to drive?

- 1- One week
- 2- Two weeks
- 3- Four weeks
- 4- Three months
- 5- Six months

Answer & Comments

Answer: 3- Four weeks

The DVLA is quite clear on this issue. He must wait at least four weeks after his MI before he is able to drive.

Similarly, patients undergoing surgical revascularisation must also wait four weeks.

If he was admitted with angina and underwent percutaneous transluminal coronary angioplasty (PTCA) then he should wait one week.



[Q: 1663] OnExamination 2012 - Cardiology

According to Starling's law, when the end-diastolic volume increases, resulting in myocardial stretch, *how does the heart maintain an adequate cardiac output?*

- 1- Increases capillary permeability
- 2- Increases central vasodilation to redistribute the fluid to other organs
- 3- Increases myocardial contraction
- 4- Increases peripheral vasodilation to reduce strain on the heart
- 5- Increases urine production to reduce intravascular volume

Answer & Comments

Answer: 3- Increases myocardial contraction

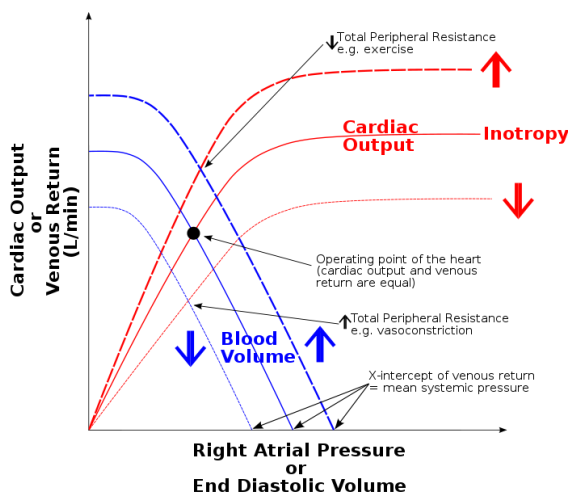
The cardiac output (CO) is the volume of blood being pumped by the heart in one minute, and must be maintained within a narrow range to allow normal function. It is a reflection of how well the body is being perfused, and therefore how well the body can work (perfusion enables energy production). It can be calculated from the stroke volume (SV) and heart rate (HR) as follows:

$$CO = HR \times SV$$

Stroke volume, (the amount of blood pushed out of the left ventricle on each pump of the heart), is determined by many factors which are summed up in (Frank-) Starling's law. This law states that when the myocardium stretches due to blood pooling, the force of contraction increases, to preserve the stroke volume, and thus the cardiac output.

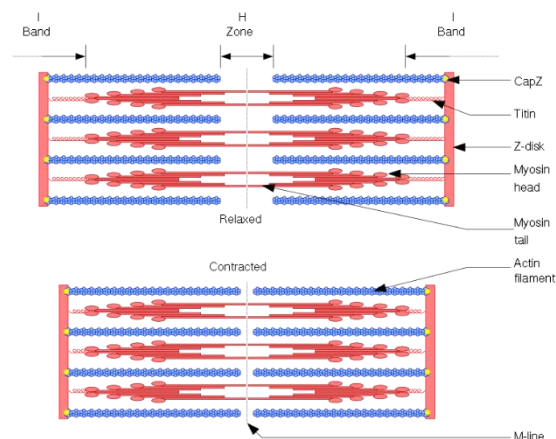
The diagram below shows that the ideal operating point of the heart occurs when cardiac output and venous return are equal (that is, blood in equals blood out).

As end-diastolic volume increases from this point, there is greater myocardial stretch and a greater rebound contraction. The result is that cardiac output can increase but only up to a certain point. After this, cardiac output cannot increase further despite excessive end-diastolic pressure.



(Diagram of showing the physiological relationship between the Starling Law of the heart and venous return pressure and volume. Public Domain license: http://en.wikipedia.org/wiki/File:Starling_RAP_combined.svg)

This increase in rebound contraction involves the sarcomere - the basic muscle unit of the myocardium (see diagram below). When required, the sarcomere can stretch to allow more interaction between its branches (actin and myosin filaments). At 2.2 micrometers, the number of interactions is maximal. If the heart continues to stretch the sarcomeres lengthens to over 2.2 micrometers, and the number of interactions decrease. This results in less effective contractions of the heart overall which can eventually lead to heart failure.



(Sarcomere. GNU Free License. Taken from: <http://en.wikipedia.org/wiki/File:Sarcomere.svg>)



[Q: 1664] OnExamination 2012 - Cardiology

A 52-year-old housewife presents to the hypertension clinic with hypertension that has proved difficult to control.

Her general practitioner has started ramipril 1.25 mg, amlodipine 5 mg, bisoprolol 2.5 mg and bendroflumethiazide 2.5 mg. Her systolic blood pressure is 152 mmHg, and it has consistently ranged 150 - 160 mmHg.

The urine dipstick is normal. Renal function and electrolytes are normal. Her ECG showed borderline left axis deviation but is otherwise normal in rhythm and complexes, and a subsequent echocardiogram demonstrates good ejection fraction with no significant systolic or diastolic impairment.

What is the best treatment option for this patient?

- 1- Add spironolactone 2.5 mg
- 2- Add isosorbide mononitrate 25 mg BD
- 3- Increase bendroflumethiazide to 5 mg
- 4- Increase ramipril to 2.5 mg
- 5- Venesection

Answer & Comments

Answer: 4- Increase ramipril to 2.5 mg

Use of multiple antihypertensives at low doses is preferable to having fewer tablets at higher doses, in view of the synergistic effectiveness of targeting several underpinning mechanisms of hypertension.

The ramipril dose can be increased, as the renal function is normal and 1.25 mg is a modest dose.

Repeat renal function is advised following any increase in ACE inhibition.

Spironolactone is indicated in heart failure, at the higher dose of 25 mg.

Other indications include portal hypertension-induced abdominal ascites, nephrotic syndrome and hyperaldosteronism syndrome. Renal function is normal, making the possibility of hyperaldosteronism (which features a hypokalaemic alkalosis) remote.

Nitrates are indicated in angina, as an adjuvant in heart failure, but not solely for hypertension in view of tolerance to their antihypertensive action.

The echocardiogram excludes systolic and diastolic heart failure, and thus the indication for spironolactone or nitrates.

Bendroflumethiazide above the standard dose of 2.5 mg OD has no beneficial effects in blood pressure profile and runs an increased risk of side effects (exacerbating gout, diabetes, lupus and renal impairment).

Therapeutic venesection has no role in the management of chronic hypertension.

Other antihypertensive options include adding another diuretic (metolazone or bumetanide or two potent loop diuretics), alpha blocker (doxazosin) or beta blockers.

Reference:

NICE Clinical Guideline 34: Hypertension. National Institute for Health and Clinical Excellence, London (2006).



[Q: 1665] OnExamination 2012 - Cardiology

A 59-year-old office worker is diagnosed with essential hypertension, following sequential blood pressure readings in the range of 150 - 162 / 85 - 92.

She has no other medical issues, and is started on an ACE inhibitor, which is uptitrated over the following year to a dose of ramipril 5 mg OD. At her next consultation she reports a concerted effort to address lifestyle factors over the preceding year, leading to substantial weight loss. She has also given up occasional smoking since her retirement, and is currently asymptomatic.

On clinical examination the blood pressure is 126 / 78. BMI 22.4. The apex is undisplaced. Fasting blood tests are as follows:

Serum Sodium 141[132 - 144 mmol/l]

Serum Potassium 4.2[3.5 - 5.0 mmol/l]

Urea 4.7[2.5 - 7.5 mmol/l]

Creatinine 74[50 - 120 µmol/l]

Bilirubin 8[2 - 17 µmol/l]

Alanine aminotransferase 23[5 - 40 U/l]

Alkaline phosphatase 70[50 - 160 U/l]

Albumin 32[35 - 55 g/l]

Total protein 86[62 - 80 g/l]

C Reactive protein 4[10mg/l]

ECG normal sinus rhythm

What is the next step in management of this patient's blood pressure?

- 1- 24 hour urinary protein
- 2- Add aspirin 75 mg for primary prevention
- 3- Encourage continued weight loss and recheck blood pressure in a year
- 4- Myeloma screen
- 5- Reduce ramipril to 1.25 mg

Answer & Comments

Answer: 5- Reduce ramipril to 1.25 mg

The patient has closely adhered to advice on lifestyle modification with great success.

Her blood pressure has normalised in the absence of precipitating environmental factors, providing an opportune moment to trial withdrawal of pharmacotherapy. She is at low cardiovascular risk, and the dose of ACE inhibitor should be tapered with a view to stopping it altogether.

Aspirin is not advised for primary prevention of ischaemic heart disease in a low-risk population, as the risk-benefit ratio is unconvincing in this population. Continued weight loss may be beneficial to her overall health, but there is little room for improvement in her blood pressure so there is nothing against reducing her tablets now.

Note the borderline abnormalities in protein and albumin levels. A high protein level in the presence of low albumin level may indicate a surreptitious monoclonal gammopathy, and considering myeloma is advisable at this stage (though it is not part of management of blood

pressure, and therefore an incorrect answer to this question).

Serum calcium, immunoglobulins, electrophoresis and early morning urinary electrophoresis / Bence Jones protein assay complete a myeloma screen, with skeletal survey only being carried out should these be suggestive of myeloma.

A urine dipstick rather than 24 hour protein collection would be more advisable in the first instance as a negative test would exclude significant renal protein losses.

Reference:

Barnett H et al. *BMJ* 2010; 340: 920 - 1: editorial against the use of aspirin in primary prevention. NICE Clinical Guideline 34: Hypertension. National Institute for Health and Clinical Excellence, London (2006).



[Q: 1666] OnExamination 2012 - Cardiology

A 70-year-old woman has failed two previous attempted cardioversions for atrial fibrillation. She has previously been echoed which revealed left atrial enlargement and mild LV dysfunction.

She has a history of a previous myocardial infarction four years earlier, and currently takes ramipril 10 mg, furosemide 40 mg, atorvastatin 40 mg, and aspirin 75 mg.

On examination her BP is 135/70 mmHg, with a pulse of 100 in atrial fibrillation (AF). She has bibasal crackles consistent with heart failure and there is mild bilateral pitting oedema.

Investigations show:

Hb 11.9 g/dl (11.5-16.5)

WCC $6.1 \times 10^9/L$ (4-11)

PLT $221 \times 10^9/L$ (150-400)

Na 139 mmol/l (135-146)

K 4.4 mmol/l (3.5-5)

Cr 131 $\mu\text{mol/l}$ (79-118)

Which of the following would be the most appropriate agent in this patient for rate control of her AF?

- 1- Amiodarone
- 2- Amlodipine
- 3- Atenolol
- 4- Bisoprolol
- 5- Digoxin

Answer & Comments

Answer: 4- Bisoprolol

This patient has a history of ischaemic heart disease and heart failure present on clinical examination. As such, she is likely to gain a potential outcome benefit from a selective β -blocker such as bisoprolol, which has demonstrated outcomes from the CIBIS 2 study.

Digoxin would be a reasonable alternative for rate control and also has some benefit in terms of symptom relief for heart failure, but would not be the first choice, especially in view of her mild renal impairment.

Amlodipine has no significant effect with respect to rate control in AF, and amiodarone is most appropriate for chemical cardioversion.



[Q: 1667] OnExamination 2012 - Cardiology

A 24-year-old woman develops infective endocarditis involving the aortic valve.

She receives a porcine bioprosthesis because of her desire to have children and not to take anticoagulant medication.

After ten years, she must have this prosthetic valve replaced.

Which of the following pathological findings in the bioprosthesis has most likely led to the need for replacement?

- 1- Calcification with stenosis

- 2- Dehiscence
- 3- Infective endocarditis
- 4- Strut failure
- 5- Thrombosis

Answer & Comments

Answer: 1- Calcification with stenosis

The bioprosthesis has the advantage of not requiring anticoagulation, but it does not wear well with time, and typically must be replaced within five to 10 years.



[Q: 1668] OnExamination 2012 - Cardiology

A 25-year-old female who is 20 weeks pregnant with her first child is admitted with palpitations.

The ECG reveals a supraventricular tachycardia (SVT) and this self terminates 20 minutes after admission. Subsequently she has further runs of symptomatic SVT.

What would be the most appropriate treatment for this patient's paroxysmal supraventricular tachycardia?

- 1- Amiodarone
- 2- Disopyramide
- 3- Flecainide
- 4- Metoprolol
- 5- Verapamil

Answer & Comments

Answer: 4- Metoprolol

Tachyarrhythmias may increase during pregnancy although the causes are not entirely clear.

Regarding the termination of acute SVT, adenosine appears to be safe in pregnancy. In the case of the prevention of recurrent SVT then verapamil or β -blockers have data supporting their use.

Current AHA/EHA criteria for the treatment of SVTs in pregnancy do suggest using metoprolol (level of evidence 1B) rather than verapamil (C), although they recommend avoiding the former in the first trimester.



[Q: 1669] OnExamination 2012 - Cardiology

You wish to calculate a patient's ejection fraction as the patient complains of dyspnoea.

Which of the following echocardiographic measures would be mandatory?

- 1- Aortic valve peak velocity
- 2- Left ventricular end diastolic diameter
- 3- M-mode of the aortic valve
- 4- M-mode of the mitral valve
- 5- Pulse wave of mitral inflow

Answer & Comments

Answer: 2- Left ventricular end diastolic diameter

One way of measuring ejection fraction is estimated by the ratio between the M-mode readings of the left ventricular end diastolic diameter divided by the end systolic diameter.



[Q: 1670] OnExamination 2012 - Cardiology

A 62-year-old male undergoes cardioversion for idiopathic atrial fibrillation (AF). Post-procedure he was shown to be in sinus rhythm.

Medication at admission included warfarin, digoxin and atenolol, which he had been taking for the last six weeks.

Which of the following agents should he continue to take until he is seen in clinic in six weeks time?

- 1- Aspirin
- 2- Atenolol
- 3- Digoxin

- 4- Sotalol
- 5- Warfarin

Answer & Comments

Answer: 5- Warfarin

This patient has undergone successful cardioversion for idiopathic AF and needs to remain on warfarin as his risk of further thromboembolism, due to the fact that his atria are now contracting, normally remains high up until six weeks after achieving sinus rhythm.

Digoxin is not required post-procedure as neither it, nor atenolol, maintains sinus rhythm.

Aspirin is not as good as warfarin in preventing thromboembolic disease.

Sotalol, like amiodarone, is good at chemical cardioversion and maintaining SR but its role post-cardioversion is uncertain.



[Q: 1671] OnExamination 2012 - Cardiology

A 78-year-old female is referred by her GP with high blood pressure. Over the last three months her blood pressure is noted to be around 180/80 mmHg. She has a body mass index of 25.5 kg/m² and is a non-smoker.

There are no features to suggest a secondary cause for her hypertension.

Which of the following is the most appropriate treatment for her blood pressure?

- 1- Alpha-blocker
- 2- Angiotensin blocker
- 3- Angiotensin converting enzyme (ACE) inhibitor
- 4- Beta-blocker
- 5- Calcium channel blocker

Answer & Comments

Answer: 5- Calcium channel blocker

This patient has isolated systolic hypertension (systolic BP >160 and diastolic BP <90 mmHg) which is the typical hypertension in the elderly population and is associated with a greater risk than combined systolic/diastolic hypertension.

Based upon studies such as SHEP and Syst-Eur, guidelines suggest treatment with either calcium antagonists or diuretics.



[Q: 1672] OnExamination 2012 - Cardiology

A 56-year-old male with left ventricular systolic dysfunction was dyspnoeic on climbing stairs but not at rest. The patient was commenced on ramipril and furosemide.

Which one of the following drugs would improve the patient's prognosis?

- 1- Amiodarone
- 2- Amlodipine
- 3- Bisoprolol
- 4- Digoxin
- 5- Nitrate therapy

Answer & Comments

Answer: 3- Bisoprolol

This patient has NYHA stage II heart failure.

Studies such as CIBIS-II and MERIT-HF reveal that β -blockers significantly reduce morbidity and mortality in heart failure.



[Q: 1673] OnExamination 2012 - Cardiology

A child is brought to the Emergency department by his parents after a three month history of blue lips and breathlessness.

You arrange urgent admission and follow up the case on your next shift. You call the

paediatric SHO to find out about the child. She tells you he underwent a transthoracic echocardiogram and it demonstrated displacement of the tricuspid valve towards the apex, a small 'atrialised' and hypoplastic RV and an ASD. You go to the ward to see the patient and look in his notes. You review his ECG.

Based on the likely diagnosis, which ECG finding is most likely to be present?

- 1- Left axis deviation
- 2- Left bundle branch block
- 3- Right bundle branch block
- 4- Type A Wolff-Parkinson-White (WPW) pattern
- 5- Type B Wolff-Parkinson-White pattern

Answer & Comments

Answer: 3- Right bundle branch block

The echo findings in this child are characteristic for Ebstein's anomaly.

This congenital heart defect predominantly affects the right heart and disrupts the right bundle branch, leading to a right bundle branch block pattern on ECG.

Type B WPW is seen in around 15% of cases.

Other ECG findings include evidence of right atrial hypertrophy.



[Q: 1674] OnExamination 2012 - Cardiology

Which ONE of the following is associated with Marfan's syndrome?

- 1- Autosomal recessive inheritance
- 2- increased upper:lower body ratio
- 3- Mental retardation
- 4- Pulmonary stenosis
- 5- Retinal detachment

Answer & Comments

Answer: 5- Retinal detachment

Marfan's syndrome is an autosomal dominant condition associated with ocular abnormalities such as upwards lens dislocation and retinal detachment.

Aortic regurgitation may be a finding and aneurysmal dilatation is a feature. Upper to lower body ratio (head to symphysis pubis : symphysis pubis to toes) is decreased in Marfan Syndrome.



[Q: 1675] OnExamination 2012 - Cardiology

A 26-year-old man is found to have hypertrophic obstructive cardiomyopathy.

A 24 hour ECG recording reveals runs of non-sustained ventricular tachycardia.

He has had three episodes of syncope in the last two years.

Which of the following is the most appropriate management plan for this man?

- 1- Amiodarone
- 2- AV node ablation
- 3- Implantable cardioverter defibrillator (ICD)
- 4- Permanent pacemaker
- 5- Sotalol

Answer & Comments

Answer: 3- Implantable cardioverter defibrillator (ICD)

When the risk level for sudden cardiac death (SCD) is judged by contemporary criteria to be unacceptably high and deserving of intervention, the ICD is the most effective and reliable treatment option available, harbouring the potential for absolute protection and altering the natural history of this disease in some patients.



[Q: 1676] OnExamination 2012 - Cardiology

A 70-year-old known hypertensive and diabetic patient presents with dyspnoea on moderate exertion.

On examination he is pale, pulse rate is 98/min regular, BP is 160/70 mmHg and there are fine basal crepitations in the lungs. ECG showed left ventricular hypertrophy and renal functions were slightly deranged.

What is the most appropriate treatment for cardiac failure in this patient?

- 1- ACE-I alone
- 2- Furosemide alone
- 3- Spironolactone, ramipril and aspirin
- 4- Spironolactone, ramipril and carvedilol
- 5- Spironolactone, ramipril and digoxin

Answer & Comments

Answer: 4- Spironolactone, ramipril and carvedilol

All patients with cardiac failure should be on an angiotensin-converting enzyme inhibitor (ACE-I) if there is no contraindication.

In this patient there will be an additional benefit for hypertension and prevention of diabetic nephropathy.

Once stable β blocker should be added. It is proven that cardioselective β blockers have important beneficial effects especially in patients with underlying coronary artery disease.

The randomised Aldactone evaluation study (RALES) trial showed 30% reduction in mortality when spironolactone (25 mg) was added to the standard therapy.

Digoxin is used in heart failure with atrial fibrillation. As it is a weak positive inotrope, its role in heart failure with sinus rhythm may be best reserved if the patient remains symptomatic despite optimal therapy.

Old people with renal impairment are at increased risk of toxicity.



[Q: 1677] OnExamination 2012 - Cardiology

A 65-year-old man has an ejection systolic murmur and narrow pulse pressure on clinical examination.

There is no history of chest pain, breathlessness or syncope.

An ECHO confirms aortic stenosis and shows an aortic valve gradient of 40 mmHg. There is good left ventricular function.

Which of the following management options is the most appropriate choice in this case?

- 1- Anticoagulation
- 2- Aortic valvuloplasty
- 3- Cardiology outpatient review
- 4- Routine aortic valve replacement
- 5- Urgent aortic valve replacement

Answer & Comments

Answer: 3- Cardiology outpatient review

Indications for surgery in aortic stenosis include a gradient of 50 mmHg or more, or associated symptoms such as syncope, breathlessness and episodes of pulmonary oedema.

This patient should be monitored in cardiology clinic so that a decision on the timing of valve surgery can be made.



[Q: 1678] OnExamination 2012 - Cardiology

A 73-year-old male is referred with palpitations.

On 24 hour ambulatory ECG monitoring he is shown to have paroxysmal atrial fibrillation and is treated with amiodarone.

Through blockade of which of the following receptors is the antiarrhythmic effect of amiodarone most attributed?

- 1- Alpha receptors
- 2- Beta receptors
- 3- Calcium channels
- 4- Potassium channels
- 5- Sodium channels

Answer & Comments

Answer: 4- Potassium channels

Amiodarone is a class III antiarrhythmic and as such is used in many supra- and ventricular arrhythmias.

Its antiarrhythmic effects are due mostly to the inhibition of the rapid component of the delayed potassium rectifier IKr channel (as with sotalol) but also an effect on the slow component.

However, it is also recognised to have mild alpha-blocking effects, beta-blocking effects and calcium channel blocking effects although these are less responsible for the antiarrhythmic effects.



[Q: 1679] OnExamination 2012 - Cardiology

A 70-year-old female is reviewed in clinic after having had an anterior MI. Her echo reveals some left ventricular impairment.

You are contemplating the addition of a beta-blocker to current therapy which consists of bendroflumethiazide, aspirin and simvastatin.

Which of the following beta-blockers should be avoided?

- 1- Bisoprolol
- 2- Carvedilol
- 3- Metoprolol
- 4- Propranolol
- 5- Sotalol

Answer & Comments

Answer: 5- Sotalol

Sotalol may prolong the QT interval and leads to a risk of ventricular arrhythmias. This can be a particular risk in individuals with hypokalaemia.

The thiazide diuretic bendroflumethiazide predisposes to hypokalaemia, due to its action on inhibiting potassium reabsorption in the distal tubules of the nephrons.



[Q: 1680] OnExamination 2012 - Cardiology

Concerning complete atrioventricular septal defects which one of the following statements is true?

- 1- Are seen frequently in patients with trisomy 21
- 2- Frequently have aortic valve (AV) insufficiency
- 3- Have a normal mitral valve structure
- 4- Include a coronary sinus atrial septal defect (ASD)
- 5- Include a perimembranous ventricular septal defect

Answer & Comments

Answer: 1- Are seen frequently in patients with trisomy 21

Partial AV canal defects or ostium primum ASDs are seen in Down syndrome.

Sinus venous defects seem to be rare in Down syndrome

Possibly 50% of children with Down syndrome have a cardiac defect.



[Q: 1681] OnExamination 2012 - Cardiology

A 21-year-old woman has a history of palpitations and light headedness. ECG shows

short PR interval and inferior Q waves.

Her symptoms improve with atenolol 25 mg/day but she has had two short episodes of similar symptoms in the previous 24 hours.

What is the long term management of choice?

- 1- Anticoagulation
- 2- Oral amiodarone
- 3- Oral digoxin
- 4- Increase the dose of atenolol
- 5- Radiofrequency ablation

Answer & Comments

Answer: 5- Radiofrequency ablation

Wolff-Parkinson-White (WPW) syndrome can be associated with negative delta waves in II, III and aVF.

The long term management of choice is ablation of the accessory pathway.



[Q: 1682] OnExamination 2012 - Cardiology

A 35-year-old woman presented with a history of intermittent light-headedness. Clinical examination and 12 lead ECG were normal.

Which of the following, if present on a 24 hour Holter ECG tracing, would be the most clinically important?

- 1- Atrial premature beats.
- 2- Profound sleep-associated bradycardia.
- 3- Supraventricular tachycardia (SVT).
- 4- Transient Mobitz type 1 atrioventricular block.
- 5- Ventricular premature beats.

Answer & Comments

Answer: 3- Supraventricular tachycardia (SVT).

SVT commonly presents with palpitations but occasionally is associated with light-headedness.

I really struggled with this question. I think it is what examiners refer to as a discriminatory question or basically one with no right answer.

The problem is that intuitively SVT is the most common arrhythmia in this age group and can be associated with light-headedness but as you know significant SVT commonly presents with palpitations - however, there is no mention of palpitations.

The word "profound", preceding sleep-associated bradycardia is confusing; are they alluding to the fact that this woman has sick sinus and significant bradycardia has only manifested itself in her sleep? Is this more than just normal sleep associated bradycardia? I do not think that is the right answer though.

Then there is D. Wenkebach is almost always asymptomatic but what is a 35-year-old doing with Mobitz type I (it is commonly seen in athletes - Dean Jenkins)?

We had a straw poll here at cardiology and decided in the end the right answer is C, which I agree with.



[Q: 1683] OnExamination 2012 - Cardiology

A 75-year-old man presents with severe central crushing chest pain. ECG shows evidence of an inferior myocardial infarction (MI). He receives primary stenting to the proximal right coronary artery

Four hours after initial presentation, he starts feeling dizzy and breathless. His pulse is 30 bpm regular, BP 70/50 mmHg. Heart sounds are soft and chest clear to auscultation. ECG shows 2:1 AV block with broad QRS and T wave inversion inferiorly. IV atropine was administered but had no effect.

What is the next most important treatment?

- 1- Emergency insertion of a permanent pacemaker

- 2- Emergency temporary transvenous pacing wire
- 3- IV dopamine
- 4- IV isoprenaline
- 5- Monitor his progress

Answer & Comments

Answer: 2- Emergency temporary transvenous pacing wire

This patient has had an inferior MI which is commonly associated with conduction abnormalities. He now develops heart block which leaves him bradycardic, symptomatic and with a low BP, so just monitoring progress is not appropriate.

Isoprenaline is contraindicated in acute MI due to its positive inotropic effects and arrhythmogenic potential. IV dopamine is an inotrope which will not treat conduction block.

A temporary wire would deal with the situation until the inferior MI has fully resolved. Conduction block can recover in the next few days so a permanent pacemaker may not be required



[Q: 1684] OnExamination 2012 - Cardiology

Which of the following is not a component of the cardiac electrical conduction pathway?

- 1- Atrioventricular node
- 2- Bundle of His
- 3- Purkinje fibres
- 4- Sarcomere
- 5- Sinoatrial node

Answer & Comments

Answer: 4- Sarcomere

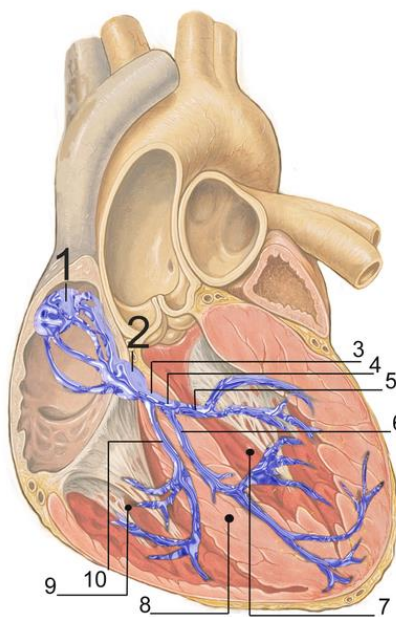
To enable the circulation of blood through the heart, and through the body, the heart

requires coordinated muscular contraction. This is made possible because of the electrical conduction pathway of the heart. An understanding of the anatomy and physiology of the conducting system is important to allow the interpretation of ECGs and the diagnosis of arrhythmias.

The electrical signal starts off at the sinoatrial node (SAN); it then passes to the atrioventricular node (AVN) depolarising the left and right atrium whilst it passes through (thus enabling contraction).

At the atrioventricular node, a short delay occurs, allowing the atrium to start relaxing, before the impulse travels down the bundle of His, and divides along the left and right bundle branches, where it causes depolarisation of the right and left ventricles, and thus ventricular contraction.

Once the atrium and ventricle have repolarised, the cycle starts anew.



1. Sinoatrial node
2. Atrioventricular node
3. Bundle of His
4. Left bundle branch

5. Left posterior fascicle
6. Left anterior fascicle
7. Left ventricle.
8. Ventricular Septum
9. Right Ventricle
10. Right Bundle Branch

Reference:

J. Heuser. *Electrical Conduction of the Heart*. Creative Commons license. Taken from http://en.wikipedia.org/wiki/File:RLS_12blauLeg.png



[Q: 1685] OnExamination 2012 - Cardiology

A 24-year-old man is admitted from a soccer match by ambulance. He collapsed during the game. Medical staff who attended the scene found him to be in VT and he was shocked by the automated defibrillator which was at the stadium.

By the time he reaches the emergency department he is beginning to regain consciousness and is complaining of a sore chest from where he was shocked. On examination his blood pressure is elevated at 145/82 mmHg. He has a double apical impulse and a mid systolic murmur.

Investigations show

Haemoglobin 13.4 g/dl (13.5-18)

White cell count $5.6 \times 10^9/L$ (4-10)

Platelets $201 \times 10^9/L$ (150-400)

Sodium 141 mmol/l (134-143)

Potassium 4.8 mmol/l (3.5-5)

Creatinine 105 $\mu\text{mol/l}$ (60-120)

ECG LVH with anterior Q waves

Which of the following is the most likely diagnosis?

- 1- Brugada syndrome
- 2- HOCM
- 3- Long QT

- 4- Post viral cardiomyopathy
5- Wolff-Parkinson-White syndrome

Answer & Comments

Answer: 2- HOCM

The double apical impulse, mid systolic murmur and ECG appearance is typical of that seen with hypertrophic obstructive cardiomyopathy (HOCM). It is the commonest cause of genetic cardiac disease, affecting 1 in 500 to 1 in 1000 adults.

Patients present with symptoms of dyspnoea, angina and syncope due to outflow obstruction, although sudden cardiac death is usually related to fatal ventricular arrhythmia.

Implantable defibrillators are now the treatment of choice in patients who suffer ventricular arrhythmias.

Patients with Brugada syndrome present with ventricular arrhythmias, but have structurally normal hearts.



[Q: 1686] OnExamination 2012 - Cardiology

Which of the following regarding the anatomy of the heart is true?

- 1- The aortic valve is tricuspid
- 2- The ascending aorta is entirely outside the pericardial sac
- 3- The left atrial appendage is identified readily by transthoracic echocardiography
- 4- The right atrium is posterior to the left atrium
- 5- The right branch of the pulmonary artery lies anterior to the ascending aorta

Answer & Comments

Answer: 1- The aortic valve is tricuspid

The right branch of the pulmonary artery lies posterior to the ascending aorta.

The ascending aorta lies completely within the pericardium as does the pulmonary trunk.

The left atrium is the most posterior chamber of the heart; the right atrium is just anterior and to the right of the left atrium.

The left atrial appendage is not readily seen on transthoracic echocardiography and requires transoesophageal echocardiography.



[Q: 1687] OnExamination 2012 - Cardiology

A 36-year-old patient with hypertension presents following an unplanned pregnancy.

Her blood pressure has been modestly controlled on amlodipine 5 mg and ramipril 2.5 mg over the past five years, with the diagnosis of essential hypertension following a thorough screen for secondary causes. She wishes to proceed with the pregnancy. Her current blood pressure is 135/85 mmHg.

What next step would you take?

- 1- 24 hour urine collection for protein
- 2- ECG to screen for evidence of end organ damage
- 3- Stop amlodipine
- 4- Stop ramipril
- 5- Switch to methyldopa

Answer & Comments

Answer: 4- Stop ramipril

Ramipril, other ACE inhibitors and angiotensin II receptor blockers have an increased risk of congenital abnormalities in pregnancy. The priority is to stop either of these drugs early in pregnancy, overriding any need to screen for end organ damage with an ECG.

Little information is available on the effects of amlodipine on the fetus, and its use may continue if the blood pressure mandates it.

Methyldopa is a drug used in pre-eclampsia.

Proteinuria is an important finding in pregnancy, though the screening tool of urine dipstick is often followed by a urinary protein/creatinine ratio rather than a formal 24 hour collection.

Target blood pressures in chronic maternal hypertension are 150/100 mmHg, or 140/90 mmHg in the context of end organ damage.

Reference:

NICE Clinical Guideline 107: Hypertension in pregnancy. National Institute for Health and Clinical Excellence, London (2010).



[Q: 1688] OnExamination 2012 - Cardiology

A 29-year-old female attends the emergency department complaining of acute onset of palpitations. She is attached to a cardiac monitor and her pulse rate is 180 bpm.

She is warm and well perfused, her BP is 135/80 mmHg, respiratory rate 20/min, oxygen saturation 100% on air and on auscultation her chest is clear with no evidence of cardiac failure.

ECG shows a narrow complex tachycardia. Carotid massage and Valsalva manoeuvre have failed to attenuate the rhythm disturbance.

What is the appropriate initial management?

- 1- DC cardioversion
- 2- IV adenosine
- 3- IV amiodarone
- 4- IV digoxin
- 5- IV magnesium

Answer & Comments

Answer: 2- IV adenosine

This patient has a narrow complex supraventricular tachycardia.

From history and examination she is not haemodynamically compromised and,

therefore, initial management would be intravenous adenosine in the absence of contraindication (for example, asthma) in order to create a transient conduction delay.

This may terminate the tachycardia, or cause a slowing in rate to allow identification of the underlying rhythm, to guide optimal anti-arrhythmic therapy.

If the patient had chest pain, hypotension, systolic blood pressure (SBP) less than 90 mmHg, or evidence of cardiac failure, then DC cardioversion would be indicated.



[Q: 1689] OnExamination 2012 - Cardiology

A 63-year-old male is admitted with a 30 minute history of central chest pain associated with nausea and sweating.

His ECG reveals ST elevation in leads II, III and aVF.

Which of the following coronary arteries is most likely to be occluded?

- 1- Circumflex artery
- 2- Left anterior descending artery
- 3- Obtuse marginal artery
- 4- Posterolateral artery
- 5- Right coronary artery

Answer & Comments

Answer: 5- Right coronary artery

The patient has had an inferior myocardial infarction (MI) and this is most likely due to occlusion of the right coronary artery.

Left anterior descending artery (LAD) occlusion results in anterior infarction; circumflex or lateral branch of the LAD results in lateral infarction.

Right coronary artery (RCA) occlusion may also cause posterior infarction.



[Q: 1690] OnExamination 2012 -
Cardiology

A 35-year-old shop worker presents with pain in her calves which develops after 50 yards of walking. The pain settles with rest.

On examination she has yellow discolouration of her palmar creases.

Her fasting lipid profile reveals:

Cholesterol 9.6 mmol/l (<5)

Triglycerides 7.3 mmol/l (<2)

What is the likely diagnosis?

- 1- Chylomicronaemia
- 2- Familial hypercholesterolaemia
- 3- Hypoalphalipoproteinaemia
- 4- Type III hyperlipidaemia
- 5- Type IV hyperlipidaemia

Answer & Comments

Answer: 4- Type III hyperlipidaemia

Remnant hyperlipidaemia (type III hyperlipidaemia) is associated with:

Hypercholesterolaemia, typically 8-12 mmol/l

Hypertriglyceridaemia, typically 5-20 mmol/l

Normal ApoB concentration

Palmar xanthomata - orange discoloration of skin creases

Tuberoeruptive xanthomata - elbows and knees

Early onset of cardiovascular disease

Early onset of peripheral vascular disease.

Remnant hyperlipidaemia is due to abnormal function of the ApoE receptor, which is normally required for clearance of chylomicron remnants and IDL from the circulation.

The receptor defect causes levels of chylomicron remnants and IDL to be higher than normal in the blood stream. The receptor

defect is an autosomal recessive mutation or polymorphism. The genotype of the homozygous condition is apo E-2/E-2 and occurs with a frequency of 1:100.

Hypoalphalipoproteinaemia is a rare, familial condition and is associated with low HDL.

Chylomicronaemia is associated particularly with hypertriglyceridaemia and not with large elevations in cholesterol.

Familial hypercholesterolaemia is due to LDL-receptor deficiency, and is not associated with elevated triglyceride levels.



[Q: 1691] OnExamination 2012 -
Cardiology

Which of the following is not associated with left atrial myxoma?

- 1- A mid-systolic click
- 2- Adrenal hyperplasia
- 3- Left atrial dilatation
- 4- Sudden death
- 5- Systemic emboli

Answer & Comments

Answer: 1- A mid-systolic click

Atrial myxomas in the heart make up 50% of primary cardiac tumours.

They are most common in the left atrium arising from a pedicle on the fossa ovalis. One third present with emboli, a third with systemic inflammation (erythrocyte sedimentation rate [ESR] elevated in 1/3) and a third are asymptomatic when detected.

They can intermittently flop through the mitral valve and cause a mid-diastolic click (tumour plop) when they stop moving.

Elevated left atrial pressures cause dilatation. Syncope can occur due to obstruction. They are more common in women.

Carney's complex is a familial multiple neoplasia and lentiginosis syndrome, associated with:

- Primary adrenal hypercortisolism
- Lentigines and naevi of the skin
- Various tumours including myxoma.



[Q: 1692] OnExamination 2012 - Cardiology

A 76-year-old woman presented with an acute myocardial infarction. The ECG showed ST segment elevation in leads II, III and aVF.

Which coronary artery is most likely to be occluded?

- 1- Circumflex artery
- 2- Diagonal branch of the left anterior descending artery
- 3- Left anterior descending artery
- 4- Left coronary artery
- 5- Right coronary artery

Answer & Comments

Answer: 5- Right coronary artery

This patient has an inferior myocardial infarction which is usually due to occlusion of the right coronary artery.

Less commonly, circumflex occlusion may be responsible.



[Q: 1693] OnExamination 2012 - Cardiology

Which of the following is true regarding the coronary circulation?

- 1- Adenosine is an important mediator of metabolic vasodilatation
- 2- Coronary blood flow is independent of myocardial oxygen consumption due to autoregulation

- 3- Coronary blood flow within a normal range of blood pressure is primarily determined by perfusion pressure
- 4- Increased myocardial O₂ demand is met primarily by increasing O₂ extraction
- 5- The vasodilatory reserve of the epicardium and endocardium is equivalent under normal physiologic conditions

Answer & Comments

Answer: 1- Adenosine is an important mediator of metabolic vasodilatation

Adenosine has a particularly short half life, acts on specific adenosine cell surface receptors (A₁ and A₂) and is inactivated by adenosine deaminase. It results in coronary vasodilatation and depression of sinus node automaticity and AVN conduction.

Coronary blood flow is dependent on myocardial oxygen consumption and is pretty independently maintained throughout the ranges of blood pressure.

Increasing O₂ demands are met by increased blood supply facilitated by vasodilatation brought about by adenosine production.



[Q: 1694] OnExamination 2012 - Cardiology

A 60-year-old man had a myocardial infarction (MI) six weeks ago.

He is taking aspirin 75 mg/day and metoprolol 50 mg 2/day.

During a routine follow up exercise test he has a 20 beat run of non-sustained VT. He achieved stage 4 of the Bruce protocol and 92% of his target heart rate. The non-sustained VT occurred halfway through stage 2. ST segments were normal during the study.

What is the definitive investigation?

- 1- 24 hour Holter monitor
- 2- Coronary angiography

- 3- Echocardiogram
- 4- Electrophysiological study (EPS)
- 5- Thallium exercise scan

Answer & Comments

Answer: 4- Electrophysiological study (EPS)

Post MI ventricular tachycardia (VT) is most commonly due to scar tissue. It may also be related to ischaemia, but no signs of ischaemia were induced.

The definitive investigation would be EPS due to the fact that if this were scar-related VT the site could be localised and even possibly ablated. If not, then an implantable cardio-defibrillator (ICD) implantation may be warranted on MADIT criteria, if left ventricular (LV) dysfunction exists.

Angiography plus thallium may inform us of significant coronary artery disease (CAD) but not offer us a solution to the problem.

An echocardiogram would not be of much use apart from assessing LV function, although in this patient one might assume that LV function is pretty good achieving stage 4 of Bruce protocol, thus an echocardiogram, although required, would not be the definitive test and would be down on the selection list.

There is no need for Holter as the VT has already been recorded.

Reference:

The reference for MADIT is AmJCardiol 1997;79 (suppl 6A):16-7. It was stopped early in 1996 by the steering committee due to extremely positive results in the ICD group. As a consequence it was only published in abstract form. However, MADIT-2 published in the NEJM (Ref: N Engl J Med 2002; 346:877-883, Mar 21, 2002) showed a 5.6% 20 month absolute survival benefit in patients with LV dysfunction (EF<30%), post MI, treated prophylactically with an ICD.



[Q: 1695] OnExamination 2012 - Cardiology

You are working as part of the on-call medical team and a GP calls for some advice about a 62-year-old male patient.

He is a heavy smoker and has a long and extensive history of peripheral vascular disease. He has had two recent admissions under the vascular surgeons, both occasions requiring embolectomy surgery. His GP is unsure which medication to start to reduce his risk of an occlusive vascular event. Unfortunately, the patient is intolerant of aspirin with documented severe allergy. There is no history of stroke or TIA. The patient is in sinus rhythm.

Based on this information and with regard to current NICE guidance, which management option listed is recommended to reduce occlusive vascular events in this patient?

- 1- Clopidogrel
- 2- Dabigatran
- 3- Dipyridamole modified release
- 4- Dipyridamole modified release with clopidogrel
- 5- Warfarin

Answer & Comments

Answer: 1- Clopidogrel

In 2010 NICE released a technology appraisal on the use of clopidogrel and modified release dipyridamole in the prevention of occlusive vascular events. It relates to patients who have had an occlusive vascular event or have established peripheral artery disease (PAD), as with this patient.

Clopidogrel is the first line option for those who have PAD but cannot tolerate aspirin.

Dipyridamole MR is an option for patients who have had a stroke or a TIA but not primary prevention. In combination with aspirin, dipyridamole can be used if the patient has

had a TIA or if they have had a stroke and cannot tolerate clopidogrel. It is an option used alone if they have had a stroke and aspirin/clopidogrel are not tolerated or if they have suffered a TIA and aspirin is not tolerated.

Warfarin is not indicated if they are in sinus rhythm.

Dipyridamole is not indicated in combination with clopidogrel.

Dabigatran is indicated for thromboembolic events post orthopaedic surgery or AF.

Therefore for primary prevention of occlusive vascular events in patients with established PAD but who have not had a stroke/TIA, clopidogrel is the most appropriate choice.



[Q: 1696] OnExamination 2012 - Cardiology

On physical examination a 65-year-old man is found to have pulsus alternans where there is regular alternation of the force of his radial pulse.

Which of the following conditions is the most likely diagnosis?

- 1- Aortic stenosis
- 2- Cardiac tamponade
- 3- Hypertrophic obstructive cardiomyopathy
- 4- Mixed aortic valve disease
- 5- Severe left ventricular failure

Answer & Comments

Answer: 5- Severe left ventricular failure

Pulsus alternans is a physical finding characterised by a regular alternation of the force of the arterial pulse.

It almost invariably indicates the presence of severe left ventricular systolic dysfunction.

NEJM 1996;334(13):834



[Q: 1697] OnExamination 2012 - Cardiology

A 17-year-old male presented with episodes of low back pain.

On clinical examination he is tall and has features of Marfan syndrome. You refer him for echocardiography and he asks why it is needed.

Which of the following is the most common abnormality seen in people with Marfan syndrome?

- 1- Bicuspid aortic valve
- 2- Coarctation of the aorta
- 3- Dilation of the aortic sinuses
- 4- Mitral valve prolapse
- 5- Primum atrial septal defect

Answer & Comments

Answer: 3- Dilation of the aortic sinuses

"The normal aorta has three gentle bulges, the aortic sinuses, just distal to the semilunar attachments of the three leaflets of the aortic valve. The cross sectional diameter of the aorta at the nadir of the leaflet attachment where the aorta and ventricular muscle meet, and at the upper limit of the attachment at the sinutubular junction, are very similar, with the leaflets supported with a spatial relation as if to the sides of a cylinder. The diameter of the more distal circle at the sinutubular junction is, if anything, slightly smaller than the left ventricular outflow. This relation is lost in the Marfan syndrome. The aortic root becomes bulbous and the attachments of the leaflets are splayed out."

Reference:
Heart 2000;84:674-678



[Q: 1698] OnExamination 2012 - Cardiology

A 55-year-old man presents with severe dyspnoea with tachycardia and clinical

examination raises the possibility that pericardial disease may be the cause.

Which of the following clinical features would favour cardiac tamponade rather than constrictive pericarditis?

- 1- Hypotension
- 2- Kussmaul's sign
- 3- Muffled heart sounds
- 4- Pulsus paradoxus
- 5- Raised JVP

Answer & Comments

Answer: 4- Pulsus paradoxus

In cardiac tamponade there is pulsus paradoxus (a greater than 10 mmHg fall in systolic BP on inspiration) but this is less commonly seen in constrictive pericarditis.

Kussmaul's sign (a rise in the jugular venous pressure [JVP] on inspiration) is more likely to be seen in constrictive pericarditis than cardiac tamponade.



[Q: 1699] OnExamination 2012 - Cardiology

A 38-year-old woman with a 10 year history of type 1 diabetes attends for annual review.

She has background diabetic retinopathy, microalbuminuria with a urine albumin:creatinine ratio of 4.8 mg/dl (<3). Currently, she takes basal bolus insulin four times daily and lisinopril.

She is a non-smoker, has a BMI of 30 kg/m² and a blood pressure of 124/70 mm/hg.

Investigations reveal:

- HbA1c 7.3% (3.8-6.4)
- Total cholesterol 5.2 mmol/l (<5.2)
- Triglyceride 1.9 mmol/l (0.45-1.69)
- LDL cholesterol 3.3 mmol/l (<3.36)
- HDL cholesterol 1.3 mmol/l (>1.55)

Which would be the most appropriate treatment for this patient's lipid profile?

- 1- Ezetimibe
- 2- Fenofibrate
- 3- No treatment required
- 4- Omega-3 fatty acids
- 5- Simvastatin

Answer & Comments

Answer: 5- Simvastatin

Type 1 diabetes after a duration of 10 years is associated with a 2% annual coronary heart disease (CHD) event rate, while the risk of cardiovascular events is increased in people with type 1 diabetes by factors such as co-existing microvascular complications, in particular nephropathy.

Furthermore female gender is associated with an approximate twofold increase in relative cardiovascular disease (CVD) risk in type 1 diabetes, while other factors associated with increased CVD risk in type 1 diabetes include:

degree of glycaemia

duration of diabetes

as well as classically recognised factors such as

hypertension

dyslipidaemia.

The most recent CVD treatment guidelines JBS-2 advocate that treatment targets for low density lipoprotein-cholesterol (LDL-C) and total cholesterol (TC) of <2 and <4 mmol/l in all people with diabetes over the age of 40 years, and in those under 40 where there are co-existing risk factors, for example:

Poor glycaemic control (HbA1c >9%)

Co-existing microvascular complications

Presence of another CVD risk factor or

Features of the metabolic syndrome (NCEP ATP III).

Therefore in this case simvastatin would be the most appropriate treatment choice, aiming for a treatment TC <4 mmol/l.

Statins are however not licensed for use in pregnancy, and women of child bearing age need to be counselled regarding pregnancy issues when initiating statin therapy.

Repeat lipid profile is recommended eight weeks following initiation of therapy to enable any therapeutic adjustments to be made.



[Q: 1700] OnExamination 2012 - Cardiology

A 24-year-old female is admitted with palpitations. Her pulse is 160 beats/min, blood pressure 70/50 mmHg and she has a respiratory rate 32/min.

She is awake, alert and oriented but dyspnoeic. Her electrocardiogram shows a regular rhythm with QRS complex width of 0.11s.

What is the most appropriate therapy for this patient?

- 1- Adenosine 6 mg/6 mg/12 mg
- 2- Amiodarone 300 mg
- 3- Atenolol 50 mg
- 4- Direct current cardioversion
- 5- Verapamil 10 mg

Answer & Comments

Answer: 4- Direct current cardioversion

This is highly likely to be a narrow complex tachycardia.

Strictly speaking, as this patient is showing signs of haemodynamic compromise (that is, systolic blood pressure less than 90) she should be immediately DC cardioverted under sedation/anaesthesia.

In practice, most people would try adenosine first whilst organising a cardioversion.



[Q: 1701] OnExamination 2012 - Cardiology

A 16-year-old girl was incidentally found to have delta wave on ECG suggestive of Wolff-Parkinson-White syndrome. There was no tachycardia and she was asymptomatic.

What is the next step in management?

- 1- Beta-blocker therapy
- 2- Electrophysiological study and provocation of arrhythmia
- 3- Radiofrequency catheter ablation of the bypass tract
- 4- Reassurance
- 5- Repeat ECG

Answer & Comments

Answer: 4- Reassurance

The electrocardiogram (ECG) appearances of a delta wave occur in approximately 1.5 per 1000 of the population, but many individuals never experience paroxysmal tachycardias.

The degree of pre-excitation during sinus rhythm is variable: it may be intermittent if the refractory period of the accessory pathway is close to the sinus cycle length, or unapparent if the delta wave is obscured due to rapid AV nodal conduction.

Radiofrequency catheter ablation of bypass tracts is possible in more than 90% of patients and is the treatment of choice in patients with symptomatic arrhythmias.



[Q: 1702] OnExamination 2012 - Cardiology

A 65-year-old woman undergoes temporary pacing due to complete heart block following acute myocardial infarction.

Which coronary artery is most likely to have been occluded?

- 1- Anterior descending

- 2- Circumflex
- 3- Left main coronary
- 4- Obtuse marginal
- 5- Right coronary

Answer & Comments

Answer: 5- Right coronary

Myocardial infarction complicated by bradycardia is most commonly seen in inferior wall myocardial infarction. This area of the heart is supplied by the right coronary artery.

The right coronary artery gives off branches to the sinus node and AV node, therefore disease within this vessel can cause damage to the cardiac conducting system and can thus lead to bradyarrhythmias.



[Q: 1703] OnExamination 2012 - Cardiology

A 65-year-old male attends clinic complaining of breathlessness. He has end stage cardiac failure due to dilated cardiomyopathy. Currently he takes furosemide, lisinopril and carvedilol.

Which one of the following drugs should be added to his current therapy?

- 1- Diltiazem
- 2- Isosorbide mononitrate
- 3- Nicorandil
- 4- Spironolactone
- 5- Vitamin C

Answer & Comments

Answer: 4- Spironolactone

Spironolactone (aldosterone receptor antagonist) is the optimal add on medication for advanced heart failure symptoms.



[Q: 1704] OnExamination 2012 - Cardiology

A 68-year-old woman with atrial fibrillation (AF) is admitted for DC cardioversion.

The procedure resulted in successful restoration of sinus rhythm.

Which one of the following drugs would be most likely to maintain sinus rhythm following this procedure?

- 1- Amiodarone
- 2- Digoxin
- 3- Diltiazem
- 4- Sotalol
- 5- Verapamil

Answer & Comments

Answer: 1- Amiodarone

Amiodarone has been shown to be superior in maintaining sinus rhythm following DC cardioversion of AF, however, it is associated with more toxic side effects than the other agents mentioned.

Neither verapamil, diltiazem nor digoxin would be expected to maintain sinus rhythm to any significant extent.

Sotalol may be considered as a possible therapy but is less effective than amiodarone.



[Q: 1705] OnExamination 2012 - Cardiology

A 40-year-old man attending a routine screening has a blood pressure of 166/100 mmHg. Two weeks later his blood pressure was 150/90 mmHg.

He does not smoke. He drinks 35 units alcohol/week. His body mass index (BMI) is 31.5 kg/m² (20-25).

What is the best management strategy?

- 1- Amlodipine
- 2- Atenolol

- 3- Bendroflumethiazide
- 4- Enalapril
- 5- Lifestyle advice

Answer & Comments

Answer: 5- Lifestyle advice

This 40-year-old man has grade 1 obesity as evidenced by his body mass index.

Grade 1 = 30 - 34.9

Grade 2 = 35 - 39.9

Grade 3 = >40.

Hypertension in this individual is most likely due to obesity-related hypertension or due to pseudo-Cushing's syndrome in view of his high alcohol intake and increased BMI.

Heightened sympathetic nervous system activity

Hyperinsulinaemia, insulin resistance

Hyperleptinaemia

contribute to obesity-related hypertension.

He needs lifestyle advice about reducing his alcohol intake and compatible dietary advice to reduce his weight.



[Q: 1706] OnExamination 2012 - Cardiology

You are helping out the consultant in the afternoon care of the elderly clinic.

Your next patient is a 92-year-old man with a history of aortic stenosis. He has annual transthoracic echocardiograms and his pressure gradient across the valve is stable. He is asymptomatic currently. After the clinic your consultant asks you to discuss each case with her. While discussing this patient, your consultant asks you to explain the pathophysiological mechanisms which occur in aortic stenosis.

From the list, select the pathophysiological response in aortic stenosis.

- 1- Concentric left ventricular hypertrophy
- 2- Eccentric left ventricular hypertrophy
- 3- Increase in myocyte calcium
- 4- Reduced collagen
- 5- Significant fibrosis

Answer & Comments

Answer: 1- Concentric left ventricular hypertrophy

Aortic stenosis (AS) is the most common valve problem in the United Kingdom.

There are a number of compensatory mechanisms to maintain perfusion pressure. However, as time goes on and the valve becomes more narrow, these mechanisms result in the known-later complications of AS.

The LV hypertrophies increase (in the size of myocytes) in a concentric - rather than an eccentric (asymmetric) - manner in response to the increase in afterload.

There is also an increase in interstitial collagen and little fibrosis (hence D and E are incorrect).

There is no change in myocyte calcium.



[Q: 1707] OnExamination 2012 - Cardiology

A 51-year-old traffic warden presents to primary care with incidental asymptomatic hypertension (152 / 84 mmHg). She has no comorbidities. Subsequent serial blood pressure readings are similar.

Which of the following would comprise screening for cardiovascular risk in this patient?

- 1- 24 hour urine collection
- 2- Electrocardiogram
- 3- HbA1C

4- Random lipid level

5- Retinal imaging

Answer & Comments

Answer: 2- Electrocardiogram

Any patient with hypertension should prompt a search for markers of end organ damage and risk factors for cardiovascular disease, from history-taking (headache, epistaxis, visual disturbance), through clinical examination (fundoscopy, site and character of apex beat) to screening investigations. The above incorrect responses all look for micro- and macrovascular complications, yet are not the most rational to use for screening purposes.

A urine dipstick is the first step in identifying proteinuria. Though a positive dip may be a non-specific false positive result, prompting a 24 hour urine collection, a negative dip is reassuring.

Fasting rather than random lipid levels (of total cholesterol and HDL) are of more relevance. Though HbA1C has been suggested by some as a screen for diabetes, fasting glucose remains the currently advocated standard for diagnosing diabetes and impaired glucose tolerance.

Fundoscopy, seeking the arterial changes, cotton wool spots, flame haemorrhages and papilloedema of hypertensive retinopathy, is sufficient to identify ocular complications.

Electrocardiogram screens for hypertensive left ventricular hypertrophy (Sokolow-Lyon criteria: $S1 + V5$ or $V6 > 3.5$ mV).

Renal function tests are also recommended.

Reference:

NICE Clinical Guideline 34: Hypertension. National Institute for Health and Clinical Excellence, London (2006).



[Q: 1708] OnExamination 2012 - Cardiology

A 56-year-old woman presents to the cardiology clinic with increasing attacks of syncope and pre-syncope over the past few months. She is worried that she may have an underlying cardiac defect. She has a 72 hour ECG recording.

Which of the following would be the most significant finding on 72 hour tape?

- 1- 1,000 atrial ectopics recorded over the 72 hours
- 2- 1,000 ventricular ectopics recorded over the 72 hours
- 3- Bradycardia of 40 BPM whilst asleep
- 4- Mobitz type 1 heart block with right bundle branch block (RBBB) whilst feeling light-headed
- 5- Runs of four to six beats of SVT without symptoms

Answer & Comments

Answer: 4- Mobitz type 1 heart block with right bundle branch block (RBBB) whilst feeling light-headed

Second degree heart block with RBBB implies that this patient has a significantly increased risk of complete heart block.

Runs of four to six beats of SVT, and atrial and ventricular ectopics at this rate would be seen as insignificant.

Ultimately, prior to committing to pace maker insertion, repeat tape is the most likely next step, with an electronic patient diary to see if the recorded arrhythmia corresponds to her symptoms.



[Q: 1709] OnExamination 2012 - Cardiology

A 35-year-old lady at 14 weeks' gestation is found to have a blood pressure of 160/100

mmHg. Her father is known to have hypertension.

Electrocardiogram (ECG) demonstrates features of left ventricular hypertrophy (LVH).

What is the most likely diagnosis?

- 1- Eclampsia
- 2- Essential hypertension
- 3- Pre-eclampsia
- 4- Pregnancy-induced hypertension
- 5- Renal hypertension

Answer & Comments

Answer: 2- Essential hypertension

ECG feature of LVH is the key, telling that her hypertension is not of recent onset, ruling out pregnancy-related causes.

Of all types of hypertension, essential hypertension is the most prevalent.

Her family history also supports the diagnosis.



[Q: 1710] OnExamination 2012 - Cardiology

A 60-year-old man presented with a rash over his forearms, shins and face when he visited cardiology clinic in the summer.

Which of the following medications is the most likely to be associated with this photosensitive rash?

- 1- Atenolol
- 2- Bendroflumethiazide
- 3- Clopidogrel
- 4- Digoxin
- 5- Ezetimibe

Answer & Comments

Answer: 2- Bendroflumethiazide

Photosensitivity is a common adverse effect and the cardiology drugs affected include amiodarone and thiazide diuretics.

Angiotensin-converting enzyme (ACE) inhibitors and angiotensin 2 receptor blockers (A2RBs) commonly cause rashes some of which appear to be photosensitive.



[Q: 1711] OnExamination 2012 - Cardiology

Closure of the tricuspid valve is marked by which of the following features of the jugular venous waveform?

- 1- "a" wave
- 2- "c" wave
- 3- "v" wave
- 4- "x" descent
- 5- "y" descent

Answer & Comments

Answer: 2- "c" wave

The "c" wave of the jugular venous waveform is associated with the closure of the tricuspid valve.



[Q: 1712] OnExamination 2012 - Cardiology

A 60-year-old female presents with a four week history of low grade fever, dyspnoea and fatigue.

Two months ago she received a prosthetic valve replacement for mitral regurgitation.

On examination she has a temperature of 37.7°C.

At transoesophageal echocardiography vegetations are seen.

A clinical diagnosis of prosthetic valve endocarditis is made.

Which of the following is the most likely causative organism?

- 1- Actinomycosis
- 2- Candida albicans
- 3- Enterococci
- 4- Staphylococcus epidermidis
- 5- Streptococcus viridans

Answer & Comments

Answer: 4- Staphylococcus epidermidis

Generally there are two identifiable modes of prosthetic valve endocarditis.

The first occurs within the first year after surgery affecting 0.7-3% of cases and is often due to Staphylococci.

Late endocarditis observed after two years post surgery is found in 0.5 - 1% of cases and is typically due to Streptococci - typically alpha haemolytic otherwise known as Strep. viridans.



[Q: 1713] OnExamination 2012 - Cardiology

A 59-year-old male presents with a one hour history of central crushing chest pain. He is known to be diabetic, hypertensive and is a non-smoker.

On examination his pulse rate is 90 beats/min, blood pressure 130/85 mmHg, S1 S2 are audible with no murmurs. There is no evidence of cardiac failure.

An electrocardiogram (ECG) is performed.

Which of the following would be an indication for thrombolysis?

- 1- Atrial fibrillation greater than 150 min-1
- 2- Right bundle branch block
- 3- ST depression of 2 mm in leads II, III, avF
- 4- ST elevation of 2 mm in V4-V6
- 5- Supraventricular tachycardia

Answer & Comments

Answer: 4- ST elevation of 2 mm in V4-V6

This patient is having an acute myocardial infarction (MI); the ECG changes of ST elevation of 2 mm in V4-V6 suggest an anterolateral MI.

Given this history and ECG changes, he should be given thrombolytic treatment, along with aspirin, heparin, beta-blockade, statin therapy and subsequent angiotensin-converting enzyme (ACE) inhibition.

ECG criteria for thrombolysis include:

- ST elevation of more than 1 mm in standard limb leads
- ST elevation more than 2 mm in anterior chest leads
- New left bundle branch block within 24 hours of typical pain.

Evidence beyond 12 hours of pain is equivocal thrombolysis at this time; it tends to be used if there is clinical deterioration or persistent pain.



[Q: 1714] OnExamination 2012 - Cardiology

A 70-year-old woman with established aortic stenosis (AS) attends for annual review.

Which one of the following factors is the most important in deciding the timing of surgery?

- 1- Aortic valve gradient of 50 mmHg
- 2- Left ventricular hypertrophy (LVH)
- 3- The intensity of the murmur
- 4- The patient's symptomatology
- 5- Valvular calcification

Answer & Comments

Answer: 4- The patient's symptomatology

The patient's symptomatology is probably the most important determinant in terms of the decision to operate.

Dyspnoea, chest pain and syncope are all features of aortic stenosis, and when present suggest a poor prognosis if left.

A gradient of 50 mmHg would be regarded as moderate to severe aortic stenosis but if asymptomatic nothing would be done.

LVH is a common feature of AS and does not influence the decision for surgery.

Calcific aortic disease is not of itself important and the gradient should be considered.



[Q: 1715] OnExamination 2012 - Cardiology

Which of the following concerning the use of intravenous bicarbonate in cardiorespiratory arrest is correct?

- 1- Exacerbates intracellular acidosis
- 2- Has a positive inotropic effect on ischaemic myocardium
- 3- Improves oxygen release to the tissues
- 4- Increases cerebral blood flow
- 5- Reduces pre-existent hyperkalaemia

Answer & Comments

Answer: 1- Exacerbates intracellular acidosis

Bicarbonate therapy can increase extracellular pH only if the carbon dioxide (CO₂) produced can be removed by adequate ventilation.

Indeed, if hypercapnia occurs then as CO₂ crosses cell membranes easily, intracellular pH may decrease even further with further deterioration of cellular function.

Bicarbonate has a negative inotropic effect, reducing cerebral blood flow; it shifts the oxygen dissociation curve to the left, inhibiting oxygen release to tissues.



[Q: 1716] OnExamination 2012 - Cardiology

Which of the following antiarrhythmic drugs may be used in the treatment of long QT syndrome?

- 1- Amiodarone
- 2- Atenolol
- 3- Flecainide
- 4- Propafenone
- 5- Sotalol

Answer & Comments

Answer: 2- Atenolol

B-blockers are the mainstay of treatment in long QT syndrome.

The most commonly used drugs are propranolol and nadolol, but metoprolol and atenolol are also used.

Implantable cardioverter-defibrillators are the most effective treatment in high risk cases.

The others drugs may produce a prolongation of the QT interval, exacerbating risk of polymorphic ventricular tachycardia (VT) and torsades de pointes.



[Q: 1717] OnExamination 2012 - Cardiology

A 29-year-old woman with a history of depression is admitted by ambulance after being found unconscious by her boyfriend. Apparently an empty bottle of amitriptyline tablets was found at the scene.

On examination her GCS is 10, her BP is 110/70 mmHg, pulse is 90 and regular. There are no other abnormal findings apart from some scars consistent with deliberate self harm.

Investigations show:

Haemoglobin 13.0 g/dl(11.5-16.0)

White cell count $6.1 \times 10^9/L$ (4-11)

Platelets $152 \times 10^9/L$ (150-400)

Sodium 137 mmol/l (135-146)

Potassium 4.0 mmol/l (3.5-5)

Creatinine 132 micromol/l (79-118)

Bicarbonate 12 mmol/l (22-30)

pH 7.18 (7.35-7.45)

The nurses call you over whilst you are writing up her file as she is having more prolonged runs of VT on the monitor.

What is the next best step?

- 1- Give amiodarone
- 2- Give lidocaine
- 3- Give phenytoin
- 4- Give sodium bicarbonate
- 5- Observe her

Answer & Comments

Answer: 4- Give sodium bicarbonate

This is a rare occasion where sodium bicarbonate is recommended as first line therapy, here for VT / QRS widening in tricyclic poisoning. It provides exogenous sodium to overcome the competitive fast sodium channel blockade produced by tricyclics, and produces an alkalaemia (or reverses acidaemia) that mitigates the fast sodium channel blockade by the tricyclic ingested.

Lidocaine is the second line choice for management of arrhythmias in this situation. It may exacerbate hypotension, so as such is not an appropriate first line choice.

Phenytoin, as well as being an anticonvulsant, may also have a role in suppressing ventricular tachycardia.

Amiodarone or observations alone are not recommended.



[Q: 1718] OnExamination 2012 - Cardiology

A 61-year-old Caucasian patient presents to the gastroenterology clinic following a three month history of malaise with no other specific symptoms.

She had a hysterectomy in her 40s for symptomatic fibroids following completion of her family, and developed pre-eclampsia in both of her pregnancies. She is a current and lifelong smoker, takes no alcohol and previously worked as a secretary.

Present medication consists of Premarin 300 mcg OD, salbutamol PRN, Seretide BD and amlodipine 5 mg OD.

On examination the patient is pale with normal capillary refill time. The heart rate is 72, sinus rhythm. Blood pressure is 145 / 90 mmHg. Chest auscultation revealed neither crackles nor wheeze. Examination is otherwise unremarkable, with normal fundoscopy, urine dip and ECG. Iron deficiency anaemia is seen on full blood count, and outpatient endoscopy is organised.

Other than investigating her present ailment, which additional strategy would be advisable with respect to her hypertension?

- 1- Increase amlodipine to 10 mg
- 2- Prescribe ramipril 10 mg
- 3- Prescribe spironolactone 25 mg
- 4- Repeat blood pressure later
- 5- Screen for pheochromocytoma

Answer & Comments

Answer: 4- Repeat blood pressure later

The incidental abnormality seen in the stressful situation of an outpatient clinic requires observation. Current guidelines advocate rechecking blood pressure should a reading exceeding 140 / 90 mmHg be obtained, primarily at the end of the current consultation.

Those without a prior diagnosis of hypertension merit two further checks a month apart before starting pharmacotherapy, with advice to modify lifestyle factors [dietary, exercise, alcohol and caffeine intake, smoking] in the interim.

Her endoscopy procedure and subsequent consultation to be told of results offer two opportune moments to recheck the blood pressure prior to changing her tablets.

Calcium channel blockers or thiazide diuretics are presently recommended as first-line treatment in those over 55, or all patients of African or Caribbean descent.

Those under 55 with hypertension are advised to start on an ACE inhibitor at first (or ARB blocker should they be intolerant). The starting dose of ramipril is lower than that given in option B (1.25 mg rather than 10 mg), which is uptitrated in the absence of hypotension depending on satisfactory renal function.

Though polypharmacy is in general to be avoided, in a patient with recognised hypertension adding in a second drug is more effective than increasing doses of a first drug. She presently takes a calcium channel blocker, and the next step is addition of an ACE / ARB.

Thiazide diuretics are favoured over potassium-sparing diuretics for blood pressure control.

Screening for pheochromocytoma through assaying a 24 hour urine collection is advocated in patients with more convincing signs of the disease, such as labile blood pressures exceeding 180 /110 mmHg symptoms including headache and palpitations, and signs of end organ involvement including papilloedema, haematuria and left ventricular hypertrophy.

Reference:

NICE 2011 Hypertension guidelines



[Q: 1719] OnExamination 2012 - Cardiology

A 54-year-old man is found to have a prolonged corrected QT interval on his ECG.

Which of the following drugs is the most likely cause?

- 1- Cefaclor
- 2- Digoxin
- 3- Moxonidine
- 4- Sotalol
- 5- Telmisartan

Answer & Comments

Answer: 4- Sotalol

The following are causes of drug-induced long QT:

- Sotalol
- Amiodarone
- Class 1a antiarrhythmic drugs
- Tricyclic antidepressants
- Chloroquine and
- Terfenadine.



[Q: 1720] OnExamination 2012 - Cardiology

A 16-year-old male is brought to emergency admissions with alcohol intoxication.

An initial electrocardiogram (ECG) reveals atrial fibrillation (AF) but a repeat ECG after 12 hours when he has sobered up, shows sinus rhythm. An echocardiogram is normal.

What is the most appropriate management for this patient?

- 1- Aspirin for three months
- 2- Bisoprolol for three months
- 3- Lifestyle advice
- 4- Sotalol for one month
- 5- Warfarin for one month

Answer & Comments

Answer: 3- Lifestyle advice

Excessive alcohol is a recognised cause for atrial fibrillation and is the likely cause here as the rhythm has reverted to sinus after 12 hours. There is also no evidence of structural heart disease as the echocardiogram was normal.

Therefore this patient needs advice regarding moderation of alcohol consumption and needs to be warned of the toxic effects that alcohol can have on the heart and other organs.

There is no indication for short term aspirin.

Atenolol provides rate control, which is not an issue.

Sotalol/amiodarone and flecainide can be used in paroxysmal AF.

Short term warfarin is used for four to six weeks prior to elective cardioversion to protect against embolic complications.



[Q: 1721] OnExamination 2012 - Cardiology

A 67-year-old woman is admitted with blackouts.

Her electrocardiogram shows ventricular escape with complete heart block. As you are standing there she blacks out once more. Her rhythm strip shows P wave asystole.

Which of the following would be the initial immediate treatment here after airway and breathing?

- 1- Adenosine 6 mg
- 2- Adrenaline 1 mg
- 3- Atropine 0.6 mg
- 4- Transcutaneous pacing
- 5- Transvenous pacing

Answer & Comments

Answer: 4- Transcutaneous pacing

Occasionally, atrial electrical activity continues in the absence of ventricular impulses. This is referred to as P-wave asystole and may respond to electrical pacing. This can be achieved by transvenous, transcutaneous or manual techniques. Transvenous pacing takes longer to instigate, and transcutaneous pacing is therefore the initial choice here. Manual pacing is an effective holding measure before more definitive pacing is instituted.

Atropine can also be used, as can adrenaline, for sustained P wave asystole but pacing is the initial treatment of choice. All crash trollies within UK hospitals contain the equipment required to externally pace patients.

Adenosine can induce asystole, and is only indicated in the treatment of supraventricular tachycardias.



[Q: 1722] OnExamination 2012 - Cardiology

A 75-year-old man with atrial fibrillation is successfully cardioverted having had six weeks of anticoagulation.

Which one of the following drugs would be most likely to maintain sinus rhythm following this procedure?

- 1- Amiodarone
- 2- Digoxin
- 3- Nebivolol
- 4- Sotalol
- 5- Verapamil

Answer & Comments

Answer: 1- Amiodarone

Amiodarone is a class 3 anti-arrhythmic and has the best membrane stabilising properties of the above drugs, and is most likely to maintain sinus rhythm (SR).

Sotalol is another class 3 anti-arrhythmic with an ability to maintain SR but is less effective than amiodarone.



[Q: 1723] OnExamination 2012 - Cardiology

A 17-year-old boy whose brother had hypertrophic cardiomyopathy was referred for a cardiological assessment.

His echocardiogram confirmed the condition.

Which one of the following echocardiographic features is the most important risk factor for sudden cardiac death?

- 1- A gradient of 10 mmHg across the left ventricular outflow tract
- 2- An enlarged left atrium
- 3- Significant thickening of the interventricular septum
- 4- Systolic anterior motion of the mitral valve
- 5- The presence of mitral regurgitation

Answer & Comments

Answer: 3- Significant thickening of the interventricular septum

In hypertrophic obstructive cardiomyopathy the cause of death is usually ventricular tachycardia or ventricular fibrillation.

Therefore the thicker the muscle the more abnormal the cardiac architecture and the higher the risk of arrhythmia and sudden death.



[Q: 1724] OnExamination 2012 - Cardiology

Angina due to an imbalance between O₂ supply and demand without atherosclerosis would most likely be seen in which of the following circumstances?

- 1- Aortic regurgitation
- 2- Cardiac tamponade

- 3- Pulmonary regurgitation
- 4- Right heart failure
- 5- Tricuspid regurgitation

Answer & Comments

Answer: 1- Aortic regurgitation

Non-atherosclerotic angina would be associated with conditions such as:

- Thyrotoxicosis
- Aortic regurgitation
- Aortic stenosis
- Hypertrophic cardiomyopathy
- Anaemia



[Q: 1725] OnExamination 2012 - Cardiology

A 72-year-old man presents with an episode of sudden collapse.

He has had two similar episodes recently, each lasting about one minute. Four years ago he suffered an anterior myocardial infarction.

On examination he was orientated and symptom-free with a regular pulse rate of 80 bpm, BP 140/80 mmHg and the apex beat was displaced to the left. There was an apical systolic murmur.

There were no signs of trauma. ECG showed sinus rhythm, Q waves and ST segment elevation anteriorly without reciprocal depression.

What is the diagnosis?

- 1- Acute anterior myocardial infarction
- 2- Cerebrovascular accident
- 3- Epileptic seizure
- 4- Pulmonary embolism
- 5- Ventricular tachycardia

Answer & Comments

Answer: 5- Ventricular tachycardia

The electrocardiogram is suggestive of a left ventricular (LV) aneurysm, which has a tendency for both a malignant arrhythmogenic focus and also for left ventricular thrombus.

The brief episode of loss of consciousness with no residual neurology makes the diagnosis for cerebral embolism unlikely.

The story is more suggestive of a ventricular tachycardia (VT) and would suggest further investigations. Prolonged heart rhythm monitoring and an echo are recommended.

If VT is proven then he should be on amiodarone and the indication for an automated implantable cardioverter/defibrillator strongly considered if the overall LV function is reduced.



[Q: 1726] OnExamination 2012 - Cardiology

Which one of the following statements is true about the Austin Flint murmur?

- 1- It can be distinguished from the murmur of mitral stenosis by absence of presystolic accentuation
- 2- It does not occur in aortic incompetence secondary to an aortitis
- 3- It is an early sign of aortic regurgitation (AR)
- 4- It is associated with a loud first heart sound.
- 5- It is a low frequency mid/late diastolic murmur

Answer & Comments

Answer: 5- It is a low frequency mid/late diastolic murmur

The Austin Flint murmur is a low frequency mid/late diastolic murmur which may show pre-systolic accentuation and is virtually indistinguishable from that of mitral stenosis.

It is due to partial closure of the anterior leaflet of the mitral valve by the regurgitant jet.

There is no correlation between the presence of murmur and severity of AR, or aetiology.

The first heart sound is normal but in severe cases it may be absent.



[Q: 1727] OnExamination 2012 - Cardiology

Which of the following statements concerning the treatment of acute myocardial infarction (MI) is correct?

- 1- A pansystolic murmur developing within the first 24 hours does not require further investigation
- 2- Dipyridamole therapy reduces reinfarction within the first year
- 3- Heparin is beneficial if given with streptokinase
- 4- Prophylactic lidocaine given in the first 48 hours is effective in preventing ventricular fibrillation
- 5- Treatment with a dihydropyridine calcium antagonist is associated with increased cardiovascular mortality

Answer & Comments

Answer: 5- Treatment with a dihydropyridine calcium antagonist is associated with increased cardiovascular mortality

GISSI II revealed no survival advantage of heparin plus streptokinase in acute MI compared with streptokinase alone.

ISIS II revealed that dihydropyridine calcium antagonists were associated with increased cardiovascular risk after MI.

Dipyridamole does not reduce risk.

A newly discovered pansystolic murmur may signify acquired mitral regurgitation (MR) or ventricular septal defect (VSD).



[Q: 1728] OnExamination 2012 -
Cardiology

You are in a cardiology clinic. A 48-year-old woman has been referred to the cardiology clinic with chest pain. She has been sent for some investigations and has returned to see you for the results.

Investigations have ruled out coronary artery disease but her cholesterol is high. After recording a blood pressure of 150/100 mmHg (for the second time) your CVD risk calculator suggests she should be started on a statin for primary prevention of cardiovascular disease. She has already been given lifestyle advice and is keen to start treatment to reduce her risk further.

You counsel her about starting simvastatin 40 mg once a day. She asks you about her target cholesterol.

What is your response?

- 1- No target cholesterol
- 2- Total cholesterol 5, LDL 3
- 3- Total cholesterol 4, LDL 2
- 4- Total cholesterol 3, LDL 1
- 5- None of the above

Answer & Comments

Answer: 1- No target cholesterol

For primary prevention of cardiovascular disease, there is no target total or low-density lipoprotein (LDL) cholesterol.

Patients with diabetes are considered high risk and are managed in the same way as those with established cardiovascular disease. The target for these patients is: total cholesterol 4; LDL 2.

In these patients there is therefore no need to repeat lipid profile unless patient preference.



[Q: 1729] OnExamination 2012 -
Cardiology

A 65-year-old man presented with chest pain and was found to have ST elevation in leads II, III and aVF.

He was thrombolysed and has been stable on coronary care. On the third day of admission he becomes confused and agitated, and on reviewing the history it becomes apparent that he was a heavy alcohol drinker before admission taking 80 units of alcohol per week.

Which of the following management options would be most helpful in this situation?

- 1- CT brain scan
- 2- Diazepam
- 3- Haloperidol
- 4- Psychiatric referral
- 5- Thiamine

Answer & Comments

Answer: 2- Diazepam

This man is withdrawing from alcohol and this is associated with anxiety and tachycardia which is the last thing that someone who has just had a myocardial infarction (MI) should suffer from. Also there is a risk of seizure.

Benzodiazepines are the first line of treatment for withdrawal.

Thiamine is also indicated in chronic alcoholism but is not as immediately important as diazepam.

A psychiatric referral may be necessary if his symptoms prove difficult to control but usually the psychiatry team would not be keen to intervene in what is really a medical emergency; they often advise on other strategies for sedation however.

This is unlikely to be an intracerebral bleed from thrombolysis on the third day but a computerised tomography (CT) scan may be indicated if there are focal neurological signs.

Haloperidol is best avoided because of the risk of causing hypotension.



[Q: 1730] OnExamination 2012 - Cardiology

A 24-year-old girl with Down's syndrome is found to have a systolic murmur on clinical examination.

What is the most common cardiac defect seen in patients with Down's syndrome that may explain this murmur?

- 1- Endocardial cushion defect
- 2- Mitral regurgitation
- 3- Patent ductus arteriosus
- 4- Secundum atrial septal defect
- 5- Ventricular septal defect

Answer & Comments

Answer: 1- Endocardial cushion defect

Endocardial cushion defects, more commonly known as atrioventricular (AV) canal or septal defects, include a range of defects characterised by involvement of the atrial septum, the ventricular septum, and one or both of the AV valves. (eMedicine)



[Q: 1731] OnExamination 2012 - Cardiology

A 16-year-old boy is admitted after a blackout at the dentist.

His mother describes how he blacked out as the dentist began performing a filling and that he jerked his arms a few times and was then incontinent. He awoke after a minute or so and was oriented but nauseous. There were no similar episodes in the past and he is totally unaware of what happened.

Examination was normal and his ECG was normal.

Which one of the following is the most likely diagnosis?

- 1- Complex partial seizure
- 2- Pseudoseizure
- 3- Stokes-Adams attack
- 4- Tonic-clonic seizure
- 5- Vasovagal syncope

Answer & Comments

Answer: 5- Vasovagal syncope

Vasovagal syncope is common during dental procedures, mainly induced by pain (as the dentist started drilling). The fact that he recovered very quickly supports the diagnosis of syncope. It is common to have jerking of limbs due to brain hypoxia.

Electrocardiogram (ECG) is always normal. Incontinence of urine can occur, but not biting of the tongue.



[Q: 1732] OnExamination 2012 - Cardiology

A 59-year-old man is admitted with chest pain of eight hours duration and has ST elevation in the inferior leads on his admission ECG.

An electrocardiogram from a previous clinic visit shows sinus rhythm two months ago. He has insulin-dependent diabetes mellitus and chronic renal failure.

Investigations reveal:

Fasting plasma glucose 7.4 mmol/l (3.0-6.0)

Sodium 137 mmol/l (137-144)

Potassium 4.4 mmol/l (3.5-4.9)

Urea 10 mmol/l (2.5-7.5)

Creatinine 200 µmol/l (60-110)

Which of the following which represent an absolute contraindication to the use of thrombolysis?

- 1- Allergy to penicillin
- 2- Gastrointestinal bleeding in last three months

- 3- History of haemorrhagic stroke
- 4- Ischaemic stroke 12 months ago
- 5- On warfarin therapy

Answer & Comments

Answer: 3- History of haemorrhagic stroke

Absolute contraindications to thrombolysis include:

Previous haemorrhagic stroke

Ischaemic stroke in last six months

Central nervous system damage or neoplasm

Within three weeks of major surgery, head injury or major trauma

Active internal bleeding (menses excluded) or gastrointestinal bleeding within the past month

Known or suspected aortic dissection

Known bleeding disorder

Proliferative diabetic retinopathy.

Allergy and oral anticoagulants are relative contraindications.



[Q: 1733] OnExamination 2012 - Cardiology

A 65-year-old man presents with a six month history of deteriorating breathlessness.

He is found to have aortic stenosis.

Which one of the following physical signs provides the best clinical marker of the severity of the valvular disease?

- 1- Character of the apex beat
- 2- Character of the carotid pulse
- 3- Character of the second heart sound
- 4- Intensity of the murmur
- 5- Length of the murmur

Answer & Comments

Answer: 5- Length of the murmur

The apex beat in aortic stenosis is not displaced but has a heaving character, the pulse is characteristically of small volume and slow rising, the second heart sound maybe inaudible or paradoxically split.

The murmur tends to become longer as the disease is more severe because of the longer ejection time needed.

The intensity of the murmur is not a good guide to severity as this will become less as the cardiac output is reduced with more severe disease.



[Q: 1734] OnExamination 2012 - Cardiology

A paper describes a new diagnostic test for myocardial infarction (MI).

You want to know what proportion of patients who are classified as not having had a myocardial infarction by the test will actually not have had a myocardial infarction.

Which one of the following measurements would indicate this?

- 1- Accuracy
- 2- Negative predictive value
- 3- Positive predictive value
- 4- Sensitivity
- 5- Specificity

Answer & Comments

Answer: 2- Negative predictive value

The proportion of 'true negatives' not having had a MI correctly identified by this test is called the negative predictive value and refers to the number accurately identified to not have MI by the new test over the number without MI identified by the test + those wrongly identified as not having had an MI.

Specificity is the number without MI accurately identified.

Sensitivity refers to the number correctly identified with MI by the new test.

A positive predictive value refers to the number accurately identified with MI by the test over the number accurately identified with MI + those wrongly identified with MI.

Candidates are often confused about the differences between sensitivity/specificity and positive/negative predictive values. We have had a lot of queries from candidates, asking us why the answer is negative predictive value and not specificity, since the definition of both seems to be similar. There is, however a difference and you may wish to read further into this if you are having similar difficulties. If you consider the example of a condition, for which there is a test - essentially, a knowledge of the sensitivity/specificity is based on the disease state itself, whereas predictive values are based on the test result



[Q: 1735] OnExamination 2012 - Cardiology

A 59-year-old man who was active all his life develops sudden severe anterior chest pain that radiates to his back. Within minutes, he is unconscious.

He has a history of hypertension, but a recent treadmill test had revealed no evidence for cardiac disease.

Which of the following is the most likely diagnosis?

- 1- Acute myocardial infarction (MI)
- 2- Group A streptococcal infection
- 3- Pulmonary embolus
- 4- Right middle cerebral artery embolus
- 5- Tear in the aortic intima

Answer & Comments

Answer: 5- Tear in the aortic intima

The history is typical of aortic dissection.

All the others could cause sudden collapse but not with acute chest pain radiating to the back in the presence of a recent normal exercise test.

Acute MI is possible but not the most likely.



[Q: 1736] OnExamination 2012 - Cardiology

During auscultation of the heart you discover a wide fixed splitting of the second heart sound.

In which of the following conditions does this occur?

- 1- An uncomplicated ASD
- 2- Aortic stenosis
- 3- Constrictive pericarditis
- 4- Fallot's tetralogy
- 5- Right bundle branch block (RBBB)

Answer & Comments

Answer: 1- An uncomplicated ASD

There is a single sound in Fallot's because of an absent P2.

Aortic stenosis leads to reversed splitting (also seen with left bundle branch block [LBBB] and ventricular pacemaker).

In RBBB there is wide splitting of S2 but it is not fixed.



[Q: 1737] OnExamination 2012 - Cardiology

On auscultation of the heart of a 30-year-old female a loud first heart sound is heard.

Which of the following may be responsible for this auscultatory feature?

- 1- A long preceding diastolic interval
- 2- Atrial premature beat
- 3- Increased pulmonary arterial pressure

- 4- Increased systemic arterial pressure
- 5- Rupture of a papillary muscle

Answer & Comments

Answer: 2- Atrial premature beat

A loud first heart sound is due to abrupt closure of the mitral valve against a high left atrial pressure and may occur with shortened diastole, mitral stenosis or left-right shunts.

It can also be heard with atrial premature beats.

Mitral regurgitation occurs with papillary muscle rupture and thereby the first heart sound is soft. A2 and P2 are loud in systemic hypertension and pulmonary hypertension respectively.



[Q: 1738] OnExamination 2012 - Cardiology

A 70-year-old man with dilated cardiomyopathy remains symptomatic in NYHA class 2 due to chronic heart failure.

On examination his pulse is 90 regular, BP 140/90 mmHg, heart sounds normal, chest auscultation did not reveal any abnormalities.

He is currently taking lisinopril 30 mg OD and furosemide 80 mg OD.

What is the best treatment option?

- 1- Amiodarone
- 2- Carvedilol
- 3- Digoxin
- 4- Spironolactone
- 5- Valsartan

Answer & Comments

Answer: 2- Carvedilol

Beta blockers improve mortality and quality of life (QOL) in chronic heart failure (COPERNICUS, MERIT, CIBIS trials).

They should be initiated once patients are stable and can be used in all classes of heart failure though they can cause an acute deterioration in patients who have very severe symptoms. They should be avoided in the acute setting.

Spironolactone improves outcome and symptoms in severe (Class 3-4) chronic heart failure (RALES).

Valsartan does not affect outcome as add-on treatment (VALHEFT).

Digoxin may reduce hospitalisation and improves QOL but has a neutral benefit to mortality (DIG study).

Amiodarone in the absence of arrhythmias does not affect outcome.



[Q: 1739] OnExamination 2012 - Cardiology

A 47-year-old obese lady presents to the Emergency department with a two hour history of central chest pain. This is associated with sweating and breathlessness.

The patient has a history of hypertension and diabetes. Her resting 12 lead ECGs demonstrate significant ST depression in the lateral leads. She has been given 300 mg aspirin by the paramedics. You call the cardiology registrar on-call to discuss the case. There is an on-site cardiac intervention laboratory equipped to manage unstable patients.

In discussion with the cardiology registrar, he asks your opinion on the patient's bleeding risk.

From the list, which of these features is associated with a higher bleeding risk?

- 1- Diabetes
- 2- Low body weight
- 3- Obesity
- 4- Use of proton-pump inhibitors
- 5- Younger age

Answer & Comments

Answer: 2- Low body weight

The early management of unstable angina depends on the use of antiplatelet and anti-thrombotic treatments alongside reperfusion therapy. There are a number of different anti-thrombotic agents and the choice (and dose) varies between centres.

The choice of agent also depends on patient factors, one being the patient's risk of bleeding.

Risk factors for bleeding are:

- Advancing age
- Renal impairment
- Low body weight and
- Known bleeding problems.
- PPIs do not interact in this way.



[Q: 1740] OnExamination 2012 - Cardiology

An elderly lady is admitted to the Emergency department with an episode of syncope. She has a history of high blood pressure on bendroflumethiazide.

On examination her GCS is 15/15. Blood pressure is 135/78 mmHg. Pulse is 60 regular. Cardiovascular and respiratory examination is normal. A focussed neurological examination is also normal. A 12 lead ECG demonstrates sinus rhythm with a normal axis. The corrected QT interval is 540 ms.

You are concerned this patient has had a ventricular arrhythmia leading to syncope. You send bloods urgently for electrolyte estimation.

Which of the following biochemical abnormalities can lead to this problem?

- 1- Hypercalcaemia
- 2- Hyperkalaemia
- 3- Hypoglycaemia
- 4- Hypomagnesaemia

5- Low TSH

Answer & Comments

Answer: 4- Hypomagnesaemia

This question is about acquired long QT syndrome.

Long QT can lead to torsades de pointes and syncope and sudden death. Long QT can be classified as either congenital or acquired.

There are a huge number of acquired causes including drug, biochemical and metabolic causes.

Common biochemical abnormalities include hypocalcaemia, hypokalaemia and hypomagnesaemia.

Hypoglycaemia is not a cause.

Hypothyroidism (and therefore high TSH) can lead to long QT via severe bradycardia.



[Q: 1741] OnExamination 2012 - Cardiology

A 67-year-old man presents to the Emergency department with uncontrolled nausea and vomiting.

He has a long history of COPD for which he takes high dose Seretide and theophylline tablets and has recently been prescribed some antibiotics by his GP for an exacerbation.

On examination his BP is 142/72 mmHg, his pulse is 92 and regular. Auscultation of the chest reveals wheeze and coarse crackles.

Investigations reveal:

Haemoglobin 13.4 g/dl (13.5-17.7)

White cell count $7.1 \times 10^9/L$ (4-11)

Platelets $172 \times 10^9/L$ (150-400)

Sodium 137 mmol/l (135-146)

Potassium 3.0 mmol/l (3.5-5)

Creatinine 115 micromol/l (79-118)

Which of the following antibiotics is he most likely to have been prescribed?

- 1- Amoxicillin
- 2- Azithromycin
- 3- Cefuroxime
- 4- Clarithromycin
- 5- Doxycycline

Answer & Comments

Answer: 4- Clarithromycin

This patient is showing symptoms of theophylline toxicity, and the most likely cause of toxicity is co-prescription of a CYP3A4 inhibitor. Of the options listed, only clarithromycin is a potent 3A4 inhibitor. Azole antibiotics, amiodarone, fluoxetine and cimetidine are other examples.

Azithromycin is a macrolide but is not a significant inhibitor of 3A4. Whilst case reports exist of azithromycin precipitating drug accumulation it is much less likely to do so than clarithromycin or erythromycin.

Amoxicillin, doxycycline and cephalosporins should not lead to theophylline accumulation.



[Q: 1742] OnExamination 2012 - Cardiology

A 69-year-old woman presented with an ulcer over the left ankle, which had developed over the previous nine months. She had a history of right deep vein thrombosis (DVT) five years previously.

On examination she had a superficial slough-based ulcer, 6 cm in diameter, over the medial malleolus with no evidence of cellulitis.

Which one of the following is the most appropriate next investigation?

- 1- Ankle-brachial pressure index
- 2- Bacteriological swab of the ulcer
- 3- Bilateral lower limb arteriogram

- 4- Right leg venogram
- 5- Venous duplex ultrasound scan

Answer & Comments

Answer: 1- Ankle-brachial pressure index

It has been reported that venous ulcerations are the most common type of ulcer affecting the lower extremities. The probable underlying cause of venous congestion, which may promote ulceration, is venous insufficiency.

The treatment of venous ulceration is control of oedema, treating any infection, and compression. However, compressive dressings or devices should not be applied if the arterial circulation is impaired.

It is thus important to identify any arterial disease, and ankle-brachial pressure index is a simple way of doing this. One may then progress to lower limb arteriogram if indicated.

There is no clinical sign of infection, and although a bacterial swab would help to rule out pathogens within the ulcer, arterial insufficiency is the more important issue.

If there is a clinical suspicion of DVT then duplex (or rarely a venogram) is indicated to decide on the indication for warfarin.



[Q: 1743] OnExamination 2012 - Cardiology

A 65-year-old African man with a known history of hypertension presents with ankle oedema after taking an antihypertensive prescribed by his general practitioner. He is now found to have a blood pressure of 180/100 mmHg.

Which of the following would be the preferred drug for this patient?

- 1- Amlodipine
- 2- Atenolol

- 3- Bendroflumethiazide
- 4- Ramipril
- 5- Verapamil

Answer & Comments

Answer: 3- Bendroflumethiazide

The patient has ankle oedema which is usually due to vasodilatation by calcium channel blockers.

The optimal antihypertensive therapy for black Afro-caribbean patients (if a CCB is not suitable, for example because of oedema) will be a thiazide- like diuretic according to current NICE guidance, 2011.

Angiotensin converting enzyme (ACE) inhibitors are preferred for those patients with heart failure or diabetic nephropathy.

β-blockers are preferred for post-myocardial infarction and ischaemic heart disease.



[Q: 1744] OnExamination 2012 - Cardiology

Which of the following is first to rise following myocardial infarction (MI)?

- 1- CK-MB
- 2- Creatine phosphokinase
- 3- Lactate dehydrogenase
- 4- Myoglobin
- 5- Troponin I

Answer & Comments

Answer: 4- Myoglobin

Myoglobin, is a sensitive indicator of muscle injury and is first to rise following MI within two hours but is non-specific.

Troponin and CK-MB both begin to rise approximately three hours after MI. Both are far more specific of myocardial injury.

Lactate dehydrogenase (LDH) begins to rise approximately 12 hours after MI.



[Q: 1745] OnExamination 2012 - Cardiology

A 55-year-old man attends for an insurance medical review.

He has a family history of ischaemic heart disease and has been feeling tired of late.

Investigations reveal:

Total cholesterol 6.8 mmol/L (<5.2)

HDL cholesterol 0.9 mmol/L (>1.55)

Triglycerides 2.2 mmol/L (0.45-1.69)

Free thyroxine 10 pmol/L (10-22)

TSH 22.5 mU/L (0.4-5)

What is the most appropriate treatment for this man's dyslipidaemia?

- 1- 3-Omega fish oils
- 2- Atorvastatin
- 3- Ezetimibe
- 4- Gemfibrozil
- 5- Thyroxine

Answer & Comments

Answer: 5- Thyroxine

This man has subclinical hypothyroidism with a normal thyroxine (T4) but elevated thyroid-stimulating hormone (TSH).

Thyroid hormone is known to play a role in regulating the synthesis, metabolism, and mobilisation of lipids.

It is recognised that the lipid abnormalities tend to resolve following treatment with thyroxine.



[Q: 1746] OnExamination 2012 -
Cardiology

A 72-year-old woman presented with acute severe chest pain with an ECG revealing ST segment elevation in leads II, III and aVF.

She was treated with thrombolysis but two days later became acutely unwell.

Examination revealed a loud systolic murmur at the apex which radiated into the axilla with associated pulmonary oedema.

What is the most likely diagnosis?

- 1- Acute left ventricular failure
- 2- Cardiogenic shock
- 3- Pericarditis
- 4- Ruptured papillary muscle
- 5- Ventricular septal defect

Answer & Comments

Answer: 4- Ruptured papillary muscle

The most likely explanation in this patient with a prior inferior myocardial infarct is mitral valve prolapse due to papillary muscle rupture.



[Q: 1747] OnExamination 2012 -
Cardiology

Which one of the following is a contraindication to thrombolysis?

- 1- Age over 75 years
- 2- Asthma
- 3- Background diabetic retinopathy
- 4- Pregnancy
- 5- The presence of atrial fibrillation

Answer & Comments

Answer: 4- Pregnancy

Those over 75 years benefit from thrombolysis as much or more than younger patients with myocardial infarction (MI).

Proliferative diabetic retinopathy is a relative contraindication.

Important contraindications to thrombolysis include:

- Pregnancy
- Gastrointestinal (GI) bleeding
- Heavy vaginal bleeding
- Recent stroke or surgery
- Uncontrolled severe hypertension
- GI malignancy
- Prolonged cardiopulmonary resuscitation (CPR) (more than half an hour).



[Q: 1748] OnExamination 2012 -
Cardiology

A 70-year-old man is referred by his GP for management of recently diagnosed congestive heart failure. The patient has a history of poorly controlled hypertension.

Over the last three months he has been aware of deteriorating shortness of breath, fatigue, and orthopnoea. Over the last month he had been commenced on digoxin (62.5 µg daily), furosemide (80 mg daily), and amiloride 10 mg.

On examination he has a pulse of 96 bpm regular, a blood pressure of 132/88 mmHg. His JVP was not raised, he had some scattered bibasal crackles on auscultation with a displaced apex beat in the anterior axillary line, sixth intercostal space.

Auscultation of the heart revealed no murmurs and he had peripheral oedema to the mid tibia.

Investigations showed:

Serum Sodium 144 mmol/L(137-144)

Serum Potassium 3.5 mmol/L(3.5-4.9)

Serum Urea 8 mmol/L(2.5-7.5)

Serum Creatinine 135 µmol/L(60-110)

Serum digoxin 0.7 ng/mL(1.0-2.0)

One month previously his urea had been 6 mmol/L and creatinine 110 μ mol/L. An ECG reveals left ventricular hypertrophy and chest x ray shows cardiomegaly and calcified aorta.

What is the most appropriate next step in management?

- 1- Add an ACE inhibitor to the current regimen
- 2- Add atenolol at a dose of 25 mg daily
- 3- Increase digoxin to 0.25 mg daily
- 4- Increase furosemide to 80 mg twice daily
- 5- Maintain on current therapy

Answer & Comments

Answer: 1- Add an ACE inhibitor to the current regimen

This patient would probably be classified as NYHA grade III heart failure (dyspnoeic on mild exertion).

With the persisting symptoms despite 80 mg of furosemide, guidelines would initially suggest the addition of an angiotensin-converting enzyme (ACE) inhibitor.

Although there has been a mild decline in his urea and electrolytes (U+Es) since the introduction of therapy this would not be a contraindication to the use of ACEis. However, it is essential closely to monitor U+Es in this patient following introduction of ACEi.

There is no evidence that increasing the dose of digoxin above 62.5 micrograms in a patient in sinus rhythm would have any added benefit.

B-blockers like carvedilol, metoprolol or bisoprolol in a small dose and gradually uptitrated would be of benefit, however, atenolol has no evidence of clinical benefit in heart failure.



[Q: 1749] OnExamination 2012 - Cardiology

A 17-year-old girl was found collapsed and

drowsy.

Her 12-lead ECG showed a sinus tachycardia of 120 beats per minute with a corrected QT interval of 500 ms (normal <470).

Which of the following drugs is the most likely cause of her presentation?

- 1- Amphetamine
- 2- Diphenhydramine
- 3- Glue sniffing
- 4- Methadone
- 5- Methanol

Answer & Comments

Answer: 2- Diphenhydramine

You are given here the option of choosing between two drugs that can possibly cause prolongation of QT - diphenhydramine and methadone.

However, bearing in mind that she has collapsed and is drowsy with a tachycardia, the most likely option is diphenhydramine as the tachycardia is more typical.

Many drugs can cause a prolonged QT interval.



[Q: 1750] OnExamination 2012 - Cardiology

A 30-year-old pregnant patient is referred to the cardiology clinic with a history of regular fast palpitations. The gestational age is 27 weeks. There is no history of collapse and the patient is usually fit and well.

You examine the patient. Pulse is 105 and regular and the blood pressure is 105/80 mmHg. Venous pressure is not elevated. Heart sounds are normal and a resting 12 lead ECG shows sinus rhythm only.

Regarding the normal pregnancy, which from the list below is an expected physiological change?

- 1- Bradycardia

- 2- Elevated JVP
- 3- Hypertension
- 4- Reduced stroke volume
- 5- Tachycardia

Answer & Comments

Answer: 5- Tachycardia

There are a number of physiological changes which occur during pregnancy.

The heart rate increases by 10-20 bpm, stroke volume and cardiac output increase but venous pressure should remain the same due to a 25% reduction in systemic and pulmonary vascular resistance.

Blood pressure should drop in the first and second trimester and then climb to pre-pregnancy levels by the third trimester.



[Q: 1751] OnExamination 2012 - Cardiology

A 40-year-old man has a hygienist appointment with his dentist for scaling. He is known to have a congenital bicuspid aortic valve.

Which of the following is the most appropriate form of prophylaxis against endocarditis?

- 1- Amoxicillin 1 g IV + gentamicin 120 mg IV pre-procedure
- 2- Amoxicillin 3 g PO pre-procedure
- 3- Gentamicin 120 mg IM pre-procedure
- 4- Metronidazole 1 g PO pre-procedure
- 5- No antibiotics required

Answer & Comments

Answer: 5- No antibiotics required

Although often asymptomatic and affecting 1-2% of the population, bicuspid aortic valve is a risk factor for endocarditis and later development of aortic valve disease.

However, latest NICE guidance (2008) suggests that no prophylaxis is required.

The guideline differs from other advice given by the British Society for Antimicrobial Therapy and the American Heart Association.

It may be prudent still to offer prophylaxis to those at high risk (for example, ventricular septal defect [VSD] or previous infective endocarditis).



[Q: 1752] OnExamination 2012 - Cardiology

A 75-year-old man is admitted to hospital with acute coronary syndrome and is diagnosed with a myocardial infarction (MI).

Four days later he develops a further episode of chest pain with non-specific ST-T wave changes on the ECG.

Which of the following cardiac enzymes would be the most appropriate for deciding if this second episode was a further MI?

- 1- AST
- 2- CK-MB
- 3- LDH
- 4- Troponin I
- 5- Troponin T

Answer & Comments

Answer: 2- CK-MB

Troponin T remains elevated for 10 days following an MI so a second episode of chest pain within that time, suspicious of MI, needs to be evaluated with creatine kinase (CK)-myoglobin (MB) which rises over three days to form a diagnostic profile.



[Q: 1753] OnExamination 2012 - Cardiology

A 68-year-old man has been very ill for months following the onset of chronic liver disease with hepatitis C infection.

He experiences a sudden loss of consciousness and then exhibits hemiplegia on the right. A cerebral angiogram reveals lack of perfusion in the left middle cerebral artery distribution.

What is the most likely cardiac lesion to be associated with this finding?

- 1- Acute rheumatic fever
- 2- Left atrial myxoma
- 3- Libman-Sacks endocarditis
- 4- Non-bacterial thrombotic endocarditis
- 5- Paradoxical thromboembolus

Answer & Comments

Answer: 4- Non-bacterial thrombotic endocarditis

Non-bacterial thrombotic endocarditis (marantic endocarditis) is due to platelet-fibrin thrombi that are prone to embolising.

This form of non-infective endocarditis can be seen in persons who are very debilitated or who have a hypercoagulable state.

The deposition of fibrin on valve leaflets causes sterile vegetations that can embolise.



[Q: 1754] OnExamination 2012 - Cardiology

A 32-year-old female who is 14 weeks pregnant in her third pregnancy is found to have a blood pressure of 152/88 mmHg. There are no other abnormalities of note on examination.

She has a BMI of 33.3 kg/m² and urinalysis is otherwise normal. An ECG reveals left ventricular hypertrophy (LVH).

What is the most likely aetiology of her elevated blood pressure?

- 1- Essential hypertension
- 2- Pre-eclampsia
- 3- Pregnancy-induced hypertension
- 4- Secondary hypertension

- 5- White coat (factitious) hypertension

Answer & Comments

Answer: 1- Essential hypertension

This woman has hypertension which is discovered in her pregnancy but has evidence of LVH on her ECG suggesting that this is long standing.

Often, it takes at least two years of sustained hypertension to develop LVH, and although her pregnancy may have contributed to any deterioration, the LVH suggests that it was pre-existent.

The cause for her hypertension may be secondary but her high BMI is suggestive of it being essential.



[Q: 1755] OnExamination 2012 - Cardiology

A publication reports the outcome of a new statin therapy in a placebo controlled primary prevention of ischaemic heart disease in a diabetic population.

1000 patients were randomised to receive the new therapy and 1000 allocated to placebo. The study was completed over a five year period.

In the placebo group there were 150 myocardial infarcts and in the group treated with the new statin there were 100 infarcts.

What is the relative risk reduction of MI afforded by statin therapy?

- 1- 15%
- 2- 25%
- 3- 33%
- 4- 40%
- 5- 50%

Answer & Comments

Answer: 3- 33%

There are 50 fewer MIs in the treated group than the placebo treated group, hence $50/150=33\%$.

The relative risk reduction provides information regarding the efficacy of a therapy and what reduction in risk may be expected when treating subjects rather than just having data relating to the significance of the data.



[Q: 1756] OnExamination 2012 - Cardiology

A publication reports the outcome of a new statin therapy in a placebo controlled primary prevention study of ischaemic heart disease in a diabetic population.

1000 patients were randomised to receive the new therapy and 1000 allocated to placebo.

The study was completed over a five year period.

In the placebo group there were 150 myocardial infarcts (MI) and in the group treated with the new statin there were 100 infarcts.

What is the annual percentage of myocardial infarction in the diabetic population treated with placebo?

- 1- 1%
- 2- 3%
- 3- 5%
- 4- 7%
- 5- 10%

Answer & Comments

Answer: 2- 3%

This study shows that there are 150 MIs in 1000 diabetic patients treated over a five year period in the placebo group.

Hence the rate of infarction in this group is $150/1000=15\%$, divided by five years to give the annual MI rate of 3%.



[Q: 1757] OnExamination 2012 - Cardiology

Which of the following is the most likely mechanism by which aspirin exerts its beneficial effects in patients with coronary artery disease?

- 1- Anti-inflammatory action
- 2- Cyclo-oxygenase (COX) inhibition
- 3- Glycoprotein IIB/IIIA receptor inhibition
- 4- Inhibition of binding of adenosine diphosphate (ADP) to its platelet receptor
- 5- Structural changes in platelets

Answer & Comments

Answer: 2- Cyclo-oxygenase (COX) inhibition

It inhibits platelet aggregation through inhibition on both COX I and II.

Clopidogrel inhibits ADP binding to platelet receptors.



[Q: 1758] OnExamination 2012 - Cardiology

A 70-year-old man is admitted with an acute Q wave inferior myocardial infarction (MI).

On day five, he suddenly develops pulmonary oedema and a loud systolic murmur.

Which of the following would be the most useful in establishing a diagnosis?

- 1- Chest x ray
- 2- Coronary arteriography
- 3- ECG
- 4- Right heart catheterisation and oximetry
- 5- Serum cardiac enzymes

Answer & Comments

Answer: 4- Right heart catheterisation and oximetry

This patient has developed acute left ventricular failure (LVF) five days after an inferior MI.

Things to think about include mitral valve (MV) prolapse, ventricular septal defect (VSD) or acute pericardial effusion/haemorrhage.

Right heart studies would provide information on left atrium (LA) pressures and suggestive information on the most likely diagnosis: MV prolapse.



[Q: 1759] OnExamination 2012 - Cardiology

A 44-year-old man has had no major medical problems throughout his life, except for arthritis pain involving all extremities for the past couple of years.

He has had worsening orthopnoea and ankle oedema in the past six months. He is afebrile. There is no chest pain. A chest x ray shows cardiomegaly with both enlarged left and right heart borders, along with pulmonary oedema.

Laboratory test findings include:

Sodium 139 mmol/l (137-144)

Potassium 4.3 mmol/l (3.5-4.9)

Urea 7 mmol/l (2.5-7.5)

Creatinine 95 µmol/l (60-110)

Glucose 8.6 mmol/l (3.0-6.0)

Which of the following additional laboratory test findings is he most likely to have?

- 1- Anti-centromere antibody titre of 1:320
- 2- Erythrocyte sedimentation rate of 79 mm/hr
- 3- Haemoglobin of 10.7 g/dl with MCV of 72 fl
- 4- Serum ferritin of 3400 pmol/l
- 5- Spherocytes in his peripheral blood smear

Answer & Comments

Answer: 4- Serum ferritin of 3400 pmol/l

He has findings of a cardiomyopathy with right and left heart failure. Hereditary haemochromatosis (HHC) is suspected with a serum ferritin greater than 1000 and confirmed by genetic testing.

Hereditary haemochromatosis is characterised by diabetes, congestive cardiac failure (CCF), pseudogout and slate-grey skin.

"HHC is an autosomal recessive condition and in 90% of cases in the United Kingdom (UK) the condition is owing to homozygosity for the C282Y mutation in the HFE gene. A second mutation in the HFE gene, H63D, can cause the disease when in the presence of a single C282Y mutation (the so-called 'compound heterozygote' state). These mutations are common in people of Northern European origin with a carrier frequency of the C282Y mutation of one in 10-17, in the UK, suggesting a prevalence of people homozygous for the C282Y mutation of between one in 100 and one in 280.

"If HHC becomes symptomatic by mid-life, a general practitioner (GP) with a list size of 2,000 patients should have approximately four cases. In our experience most GPs claim to have never seen a case. Herein lies the conundrum: is HHC far more common than is currently recorded in clinical records and death registers because it is not being diagnosed, or does significant disease not develop in a large proportion of C282Y homozygotes and compound heterozygotes?"



[Q: 1760] OnExamination 2012 - Cardiology

A 21-year-old man with hypertrophic cardiomyopathy presents in clinic with dizzy spells but has not had any syncopal episodes.

Which of the following, if present, would indicate an increased risk of sudden cardiac death?

- 1- Asymmetric septal hypertrophy with maximum wall thickness of 2.1 cm

- 2- Blood pressure drop of 20 mmHg during peak exercise tolerance testing
- 3- Left ventricular outflow tract gradient of 80 mmHg
- 4- Systolic anterior movement of the mitral valve on echocardiography
- 5- Worsening exertional angina

Answer & Comments

Answer: 2- Blood pressure drop of 20 mmHg during peak exercise tolerance testing

Patients with hypertrophic cardiomyopathy (HCM) are at increased risk of sudden cardiac death due to ventricular fibrillation/tachycardia (VF/VT).

The five poor prognostic markers which are predictive of sudden cardiac death are:

Syncope

Family history of HCM and sudden cardiac death

Maximum left ventricular wall thickness greater than 3 cm

Blood pressure drop during peak exercise on stress testing

Documented runs of non-sustained VT on 24 hour tape.

Left ventricular outflow tract (LVOT) obstruction causes symptoms and can lead to deterioration of LV function but does not predict sudden cardiac death.

Asymmetric septal hypertrophy is a feature of HCM; in order to assess the risk for sudden cardiac death a detailed echocardiogram with measurements of the maximum left ventricular wall thickness is required.

Systolic anterior movement of the mitral valve is often seen on echocardiogram and is thought to be the mechanism behind the left ventricular outflow tract obstruction.



[Q: 1761] OnExamination 2012 - Cardiology

Your next patient in the care of the elderly clinic is a 79-year-old lady who you initially saw two months ago with a history of palpitations. She has a history of stable coronary artery disease (CAD) and controlled hypertension on bendroflumethiazide. She remains active and lives alone independently.

When you saw her last you sent her for an echo. This demonstrates good LV function, mild concentric LVH and a dilated LA (AP diameter 5.7 cm). A 24 hour ECG has shown AF throughout, maximal rate 135. On questioning during this consultation she has noted a few episodes of palpitations lasting a few hours. Today her ECG confirms AF.

What is the most appropriate initial management of her arrhythmia?

- 1- Arrange DC cardioversion
- 2- Start amiodarone
- 3- Start bisoprolol
- 4- Start digoxin
- 5- Start sotalol

Answer & Comments

Answer: 3- Start bisoprolol

This question tests knowledge of the recommended initial strategy for patients with AF (that is, rhythm or rate control). The decision to start either strategy is based on symptoms and other clinical features.

This patient should be offered rate control in the first instance because she is older (>65), has a history of CAD and has a large left atrium (>5.5cm) which makes cardioversion less likely to be successful.

Initial treatment for a rate control strategy is either a standard β -blocker (that is, bisoprolol) or calcium channel blocker. Digoxin should only be used first line for patients who are predominantly sedentary or hypotensive.

Therefore the correct choice is start bisoprolol. The patient should also be considered for anti-coagulation based on her CHADS₂ score.

Reference:

NICE guideline 36 (2006): Atrial fibrillation



[Q: 1762] OnExamination 2012 - Cardiology

An 83-year-old man is referred to the cardiology clinic with a history of palpitations.

He presented to his GP after two days of fast, irregular palpitations. The GP noted an irregular pulse and a 12 lead ECG confirmed atrial fibrillation. He has been referred to you for assessment. In clinic today he is in sinus rhythm. His usual state of health is good; he lives independently with this wife and suffers from controlled hypertension.

He has read in the newspaper about stroke risk associated with AF and asks if he needs any medication to reduce his risk.

From the list, select the most appropriate response.

- 1- Aspirin 75 mg once a day
- 2- Aspirin 300 mg once a day
- 3- Clopidogrel 75 mg once a day
- 4- No anticoagulation necessary
- 5- Warfarin, dose adjusted to INR

Answer & Comments

Answer: 5- Warfarin, dose adjusted to INR

This patient is diagnosed with paroxysmal AF, and is in sinus rhythm when you review him.

2006 NICE guidelines (CG 36) state the decision to offer antithrombotic therapy is dependent on the patient's risk rather than if they are in paroxysmal, persistent or permanent AF.

As this patient is above 75 and is hypertensive the guidelines suggest warfarin, hence warfarin, dose adjusted to INR, is correct.

Useful clinic tools to decide on appropriate therapy are the CHADS₂ and CHADS₂-vasc scores.

Clopidogrel and aspirin 300 mg OD are not recommended for this indication.



[Q: 1763] OnExamination 2012 - Cardiology

A 55-year-old non-smoker presents to the acute medical take with a one month history of chest pain on exertion. There has been no rest pain or deterioration in symptoms.

You perform a full assessment in the Emergency department including a resting 12 lead ECG, which is normal. He is normotensive. His total cholesterol is 5.2. He is not diabetic.

Based on your assessment you feel that he does not need admission. On the post-take ward round your consultant (who is a cardiologist) agrees but asks you to recommend the next investigation based on current NICE guidelines.

From the list below, select the most appropriate response to your consultant's question.

- 1- Cardiac CT with calcium scoring
- 2- Cardiac MR
- 3- Dobutamine stress echocardiography
- 4- Exercise tolerance test
- 5- Invasive coronary angiogram

Answer & Comments

Answer: 5- Invasive coronary angiogram

Coronary angiogram is recommended for investigation of patients presenting with stable angina and a 61-90% chance of ischaemic heart disease (IHD).

NICE published a clinical guideline on the assessment and diagnosis of chest pain of recent onset in March 2010 (CG95). This recommends triage of these patients into at risk groups (10-29%, 30-60%, 61-90%, >90% likelihood of IHD) based on history of symptoms and risk factors (DM, age, smoking, cholesterol).

They provide complex tables which allow you to decide on the initial diagnostic test depending on the patient's profile. Above 90% should be treated as angina without tests.

This patient's risk is 80% and should be referred for invasive coronary angiography.

Despite its very wide use, exercise tolerance testing is no longer recommended for the assessment of patients for angina without known coronary artery disease.

Therefore the correct answer is invasive coronary angiography.



[Q: 1764] OnExamination 2012 - Cardiology

A 35-year-old healthy woman has a faint systolic murmur on physical examination. An echocardiogram is performed, and she is found to have a bicuspid aortic valve.

In explaining the meaning of this finding to her, which is the most appropriate statement?

- 1- An aortic valve replacement is eventually likely to be required
- 2- Other family members are likely to have the same condition
- 3- She should be treated with a cholesterol-lowering agent
- 4- The problem has resulted from past injection drug usage
- 5- This is one manifestation of an underlying autoimmune disease process

Answer & Comments

Answer: 1- An aortic valve replacement is eventually likely to be required

Bicuspid aortic valve (BAV) is perhaps the most common form of congenital heart disease in adults (1-2% of population).

Bicuspid valves have a propensity to wear out and calcify with ageing. Bicuspid aortic valve tends to be sporadic although there is a reported familial incidence of approximately 9%.

From a review of several sources in the literature, the Aeromedical Consultation Service (ACS) at Brooks AFB calculated a 1.2% per year incidence of aortic valve surgery in individuals with BAV, although the vast majority occur in the fifth and sixth decades of life.



[Q: 1765] OnExamination 2012 - Cardiology

A 23-year-old man attended his local NHS walk-in centre with a history of chest pains.

The doctor arranged a 12 lead ECG which he is surprised to find suggests left ventricular hypertrophy. The doctor decides to refer the patient to the local acute medical department. The patient is admitted and the next day has a transthoracic echocardiogram. This demonstrates asymmetric septal hypertrophy with a small LV cavity. Systolic function appears normal.

The cardiologist explains the diagnosis of probable hypertrophic cardiomyopathy. On the ward round the next day the patient is worried about the associated risk of death.

Which of the features listed is a recognised risk factor for sudden cardiac death?

- 1- Atrial fibrillation
- 2- Drop in systolic blood pressure of 25 mmHg on exercise
- 3- Mitral regurgitation

- 4- Older age at diagnosis
- 5- Systolic anterior motion of the mitral valve leaflets

Answer & Comments

Answer: 2- Drop in systolic blood pressure of 25 mmHg on exercise

Hypertrophic cardiomyopathy (HCM) is often asymptomatic and is noticed following routine ECGs or echocardiograms for other reasons.

HCM is a complex disease and there is a wide variability in severity and risk of serious complications (mainly ventricular arrhythmias).

Unfortunately risk of sudden cardiac death (SCD) is difficult to predict but there are recognised risk factors. Younger age at diagnosis and non-sustained VT are markers of risk. Abnormal blood pressure response to exercise is a marker for risk of SCD.



[Q: 1766] OnExamination 2012 - Cardiology

A 22-year-old man undergoes ECHO screening for HOCM.

His father died suddenly at the age of 43, and was found on post mortem to have underlying HOCM. On further questioning it transpires that there is a family history of sudden cardiovascular death.

On examination his BP is measured at 142/84 mmHg. His pulse is 78 and regular. There is a double apex beat and a mid-systolic murmur. ECHO reveals a septal wall thickness of 3.3 cm.

Which of the following factors is most closely linked to his 20 year risk of sudden cardiac death?

- 1- BP of 142/84 mmHg
- 2- Double apex beat
- 3- History of sudden cardiac death in the family

- 4- Intensity of his systolic murmur
- 5- Septal wall thickness of 3.3 cm

Answer & Comments

Answer: 5- Septal wall thickness of 3.3 cm

Prediction of sudden cardiac death risk in hypertrophic obstructive cardiomyopathy (HOCM) is notoriously difficult, but septal wall thickness greater than 3 cm is associated with a significantly increased risk. A study in the NEJM put the 20 year risk of sudden cardiac death at almost 40% for this population, even in the absence of symptoms such as angina or syncope.

It is most likely that septal hypertrophy increases the risk of ventricular arrhythmias.

Other factors known to mark out increased risk of sudden death include documented collapse, or ventricular arrhythmias documented on Holter monitoring, both of which would prompt consideration of an implantable cardioverter defibrillator.



[Q: 1767] OnExamination 2012 - Cardiology

A 72-year-old man presented following three episodes of transient loss of consciousness not associated with chest pain. There was a previous history of an anterior myocardial infarction.

On examination his blood pressure was 140/80 mmHg and the apex beat was diffuse in character and displaced to the left. There were no neurological signs.

The ECG showed sinus rhythm with occasional ventricular extrasystoles, deep anterior Q waves and ST segment elevation in leads V2 - V6, without reciprocal depression.

Which one of the following would be the most appropriate initial course of action?

- 1- Administer tissue plasminogen activator
- 2- Arrange an electroencephalogram

- 3- Arrange immediate computerised tomography (CT) brain scan
- 4- Observe in the coronary care unit
- 5- Proceed to coronary arteriography

Answer & Comments

Answer: 4- Observe in the coronary care unit

The history suggests that this man has persistent ST elevation in the anterior leads, with a previous history of anterior myocardial infarction due to left ventricular (LV) aneurysm. The blackouts are cardiac syncope due to rhythm disturbance. An ECHO would quickly support the diagnosis but, because of the risk of sudden death, observation on CCU is required.

The loss of consciousness is likely to be due to recurrent arrhythmic episodes or vertebrobasilar transient ischaemic attacks (TIAs), as a result of embolisation of an LV thrombus.

The most important investigation for this patient whom you suspect has arrhythmic episodes would be telemetry/24 hour monitoring, and hence observation on the coronary care unit (CCU) is appropriate.



[Q: 1768] OnExamination 2012 - Cardiology

A study reveals an immediate rise in blood pressure following infusion of a hormone in normal volunteers.

Which of the following is the most likely hormone used in this study?

- 1- Angiotensin I
- 2- Angiotensin II
- 3- Atrial natriuretic peptide (ANP)
- 4- Brain natriuretic peptide (BNP)
- 5- Prolactin

Answer & Comments

Answer: 2- Angiotensin II

Angiotensin II when infused intravenously produces an immediate rise in blood pressure being a potent vasoconstrictor.

Both BNP and ANP result in natriuresis and lowering of blood pressure.

Prolactin has no specific effect.



[Q: 1769] OnExamination 2012 - Cardiology

A 65-year-old male with left ventricular systolic dysfunction was dyspnoeic on climbing stairs but not at rest. The patient was commenced on ramipril and furosemide.

Which one of the following drugs would improve the patient's prognosis further?

- 1- Amiodarone
- 2- Digoxin
- 3- Diltiazem
- 4- Isosorbide mononitrate
- 5- Metoprolol

Answer & Comments

Answer: 5- Metoprolol

This patient has NYHA grade II heart failure and is already receiving angiotensin converting enzyme (ACE) inhibitors and diuretics.

Studies such as CIBIS, MERIT HF and COPERNICUS clearly demonstrate the advantage of β -blockers even with severe heart failure.



[Q: 1770] OnExamination 2012 - Cardiology

A 74-year-old man presented with acute pain, pallor and absent pulses in his right leg.

Investigations revealed an embolus in his femoral artery.

What is the most likely source of this embolus?

- 1- Marantic endocarditis
- 2- Paradoxical emboli
- 3- Rheumatic endocardial vegetations
- 4- Right ventricular thrombi
- 5- Thrombi from an atheromatous aorta

Answer & Comments

Answer: 5- Thrombi from an atheromatous aorta

Ulceration of an atheromatous plaque of the abdominal aorta is the most common source of emboli in this situation.

Right ventricular thrombi would embolise to the lung.

The others are possible but less likely causes.



[Q: 1771] OnExamination 2012 - Cardiology

A 62-year-old man has experienced substernal chest pain upon exertion with increasing frequency over the past one year.

An electrocardiogram shows T wave inversion in the anterolateral leads at rest. He has a total serum cholesterol of 7.0 mmol/l (<5.2).

On angiography, he has an 85% narrowing of the left anterior descending (LAD) artery.

Which of the following events is most likely to occur in this patient?

- 1- A systemic artery embolus from a left atrial mural thrombus
- 2- A systemic artery embolus from a left ventricular mural thrombus
- 3- A systemic artery embolus from thrombosis in a peripheral vein
- 4- Pulmonary embolism from a left ventricular mural thrombus

- 5- Pulmonary embolism from thrombosis in a peripheral vein

Answer & Comments

Answer: 2- A systemic artery embolus from a left ventricular mural thrombus

The suggestion here is that this man has coronary artery disease with an impending myocardial infarction.

Infarction of the LAD would cause necrosis of the left ventricle.

Thrombus may form on an area of dyskinetic ventricle. Therefore he is most at risk of embolus of thrombus from the left ventricle (LV).



[Q: 1772] OnExamination 2012 - Cardiology

Which of the following statements is true of coronary artery anatomy?

- 1- Right bundle branch block in acute anterior myocardial infarction suggests obstruction prior to the first septal branch of the left anterior descending coronary artery
- 2- The AV node is supplied by the left anterior descending coronary artery
- 3- The left main stem is about 4 cm long
- 4- The posterior descending artery is usually a branch of the circumflex artery
- 5- The sinus node is supplied by a branch of the right coronary in over 90% of subjects

Answer & Comments

Answer: 1- Right bundle branch block in acute anterior myocardial infarction suggests obstruction prior to the first septal branch of the left anterior descending coronary artery

It is sometimes said that options longer than two lines are usually false - but not in this case. The posterior descending artery is most

often (85%) a branch of the right coronary artery.

The sinus node artery is a branch of the right coronary artery in 60% of cases.

The AV node is supplied from the right coronary artery.

The left main stem is much shorter than 4 cm.



[Q: 1773] OnExamination 2012 - Cardiology

A 43-year-old man is on the coronary care unit after suffering a large anterior myocardial infarction. Fortunately he recovered well following timely reperfusion treatment. After the ward round his wife asks for some advice on how he can reduce the risk of this happening again.

From the list of activities below, which is recommend by NICE for secondary prevention of myocardial infarction?

- 1- 20-30 minutes of physical activity a day
- 2- Abstain from alcohol
- 3- Beta-carotene supplements
- 4- Cut down cigarette use
- 5- Vitamin E supplements

Answer & Comments

Answer: 1- 20-30 minutes of physical activity a day

Following a myocardial infarction, NICE recommends a number of lifestyle modifications as prevention. These include increasing physical activity to 20-30 minutes per day, which seems daunting to patients who may not have exercised as such since school.

It advises this is increased slowly and cardiac rehabilitation classes can help promote and encourage this.

Abstinence from alcohol is not recommended per se, but should be used in moderation.

Smokers should be encouraged to stop, and cutting down does not work.

Vitamin E and beta-carotene supplements are specifically mentioned and are not to be recommended.



[Q: 1774] OnExamination 2012 - Cardiology

A 60-year-old man presents with features of left ventricular failure.

He is comfortable at rest but ordinary physical activity results in fatigue and shortness of breath.

Which of the following New York Heart Association's classifications best match the severity of this man's disease?

- 1- Normal
- 2- NYHA Class I
- 3- NYHA Class II
- 4- NYHA Class III
- 5- NYHA Class IV

Answer & Comments

Answer: 3- NYHA Class II

In 1928 the New York Heart Association published a classification of patients with cardiac disease based on clinical severity and prognosis.

This classification has been updated in seven subsequent editions of Nomenclature and Criteria for Diagnosis of Diseases of the Heart and Great Vessels (Little, Brown & Co). The ninth edition, revised by the Criteria Committee of the American Heart Association, New York City Affiliate, was released March 4, 1994.

"Class II. Patients with cardiac disease resulting in slight limitation of physical activity. They are comfortable at rest.

Ordinary physical activity results in fatigue, palpitation, dyspnea or anginal pain."



[Q: 1775] OnExamination 2012 - Cardiology

A 16-year-old profoundly deaf boy on holiday in the United Kingdom from Denmark presents with recurrent episodes of syncope and is found to have a long QT interval on his ECG.

His faxed medical records indicate that he has Jervell and Lange-Nielsen syndrome.

Which of the following genes is affected in this condition?

- 1- CACNA1c gene
- 2- Caveolin 3 related gene
- 3- Human ether-à-go-go related gene (hERG)
- 4- KCNQ1 gene
- 5- SCN5A gene

Answer & Comments

Answer: 4- KCNQ1 gene

Mutations in the KCNE1 and KCNQ1 genes cause Jervell and Lange-Nielsen syndrome.

The KCNE1 and KCNQ1 genes provide instructions for making proteins that work together to form a channel across cell membranes. These channels transport positively charged potassium atoms (ions) out of cells. The movement of potassium ions through these channels is critical for maintaining the normal functions of inner ear structures and cardiac muscle.

All the other genes mentioned are associated with long QT syndromes.

The human ether-à-go-go related gene (hERG) is the gene affected by drugs that lengthen QT interval inadvertently; erythromycin, terfenadine, and ketoconazole.



[Q: 1776] OnExamination 2012 - Cardiology

An elderly man with a history of asthma, congestive heart failure, and peptic ulcer disease is admitted with bronchospasm and rapid atrial fibrillation. He is given nebulised salbutamol frequently, a loading dose of oral digoxin, and oral prednisolone. His regular medications are continued. 24 hours after admission his plasma potassium is noted to be 2.8 mmol/l.

Which of his medications is most likely to have caused this abnormality?

- 1- ACE inhibitor
- 2- Digoxin
- 3- Ranitidine
- 4- Salbutamol
- 5- Spironolactone

Answer & Comments

Answer: 4- Salbutamol

High doses of parenteral and nebulised salbutamol are associated with hypokalaemia. This effect may have been potentiated by concomitant treatment with prednisolone.

Spironolactone and ACE inhibitors commonly cause hyperkalaemia (their use in combination is potentially dangerous and requires regular monitoring of serum electrolytes).

Electrolyte disturbance with ranitidine is unlikely.

Digoxin does not cause hypokalaemia (unless due to vomiting associated with digoxin toxicity). Hypokalaemia increases cardiac sensitivity to digoxin and predisposes the patient to digoxin toxicity; correction of hypokalaemia is recommended to avoid arrhythmias.



[Q: 1777] OnExamination 2012 -
Cardiology

Which of the following cardiac drugs shorten the QT interval?

- 1- Amiodarone
- 2- Digoxin
- 3- Moxonidine
- 4- Sodium nitroprusside
- 5- Sotalol

Answer & Comments

Answer: 2- Digoxin

Hypercalcaemia, hypermagnesaemia, digoxin, or thyrotoxicosis cause QT shortening.



[Q: 1778] OnExamination 2012 -
Cardiology

A 68-year-old lady presents to her GP for an annual review of her heart failure treatment.

She has a blood pressure of 165/90 mmHg. She is currently taking furosemide and aspirin and she experiences dyspnoea on walking up hills.

Which of the following is the most appropriate medication to add?

- 1- Bendroflumethiazide
- 2- Enalapril
- 3- Isosorbide mononitrate
- 4- Spironolactone
- 5- Titrate dose of furosemide

Answer & Comments

Answer: 2- Enalapril

Angiotensin-converting enzyme (ACE) inhibitors remain one of the cornerstones of the treatment of heart failure (SOLVD and CONSENSUS trials).

There is clear evidence that higher doses exert greater benefit.

They are usually very well tolerated, especially in milder cases.

Reference:

Heart 2000;84(Suppl 1):i8-i10



[Q: 1779] OnExamination 2012 -
Cardiology

A 66-year-old man with insulin-dependent diabetes given ibuprofen for a knee injury is admitted with palpitations.

His electrocardiogram (ECG) shows a rate of 105 beats per minute, with absent P waves and tall T waves.

His urea and electrolytes show:

Sodium 132 mmol/l (137-144)

Potassium 6.4 mmol/l (3.5-4.9)

Urea 11 mmol/l (2.5-7.5)

Creatinine 180 µmol/l (60-110)

In this scenario, which of the following is the most appropriate immediate management?

- 1- Calcium chloride 10 mmol IV
- 2- Calcium resonium orally
- 3- Dextrose 50 mls 50% with 10 units insulin
- 4- Dialysis
- 5- Furosemide 1 mg/kg IV

Answer & Comments

Answer: 1- Calcium chloride 10 mmol IV

The ECG suggests cardiotoxicity related to hyperkalaemia and the history of palpitations is suggestive of arrhythmias.

Therefore cardio protection with calcium chloride or gluconate should be first priority and lowering potassium levels immediately thereafter.



[Q: 1780] OnExamination 2012 -
Cardiology

A 43-year-old gentleman develops chest pain

seven minutes after fiberoptic bronchoscopy.

The procedure had been performed without sedation following an intratracheal injection of 5 ml 2.5% cocaine solution and xylocaine spray to the pharynx for topical anaesthesia.

ECG showed an evolving anterior myocardial infarction.

Which of the following would you prefer for his management?

- 1- Beta-blockers
- 2- Nitrates
- 3- Percutaneous transluminal coronary angioplasty
- 4- Thrombolysis with rt-PA
- 5- Thrombolysis with streptokinase

Answer & Comments

Answer: 2- Nitrates

The underlying mechanism here is vasoconstriction, not thrombosis.

Cocaine is cardiotoxic and its use has been linked to:

- Coronary artery spasm
- Angina
- Myocardial infarction
- Arrhythmias
- Sudden cardiac death

Myocardial contraction bands, which might act as a substrate for arrhythmias.

It is important to avoid β -blockers in treating cocaine-induced chest pains or acute myocardial infarctions, as this may result in unopposed α adrenergic action with worsening coronary spasm.

Calcium channel antagonists or nitrates should be administered as early as possible.



[Q: 1781] OnExamination 2012 - Cardiology

A 50-year-old male is admitted with a three hour history of central chest pain sweating and nausea.

He has no relevant past medical history although his father died of an MI at the age of 48 and he is a smoker of five cigarettes per day. He currently takes no medication. He is seen in the morning on the consultant ward round 12 hours after admission and his pain has now settled.

Examination reveals no specific abnormality and his ECG is normal.

Which of the following investigations would be most appropriate at this point for this patient?

- 1- Coronary angiography
- 2- Echocardiography
- 3- Endoscopy
- 4- Exercise ECG
- 5- Troponin T

Answer & Comments

Answer: 5- Troponin T

This question tests your knowledge of the initial management and investigation of chest pain, which is something you will need to be fully aware of for the exam and clinical practice.

This gentleman has a number of risk factors for acute coronary syndrome: he is a smoker and has a strong family history of ischaemic heart disease (IHD). The history he gives would be consistent with cardiac chest pain.

As you will all know, acute coronary syndrome and angina have a poor prognosis and it is therefore important to diagnose it accurately in a prompt fashion. It is important to distinguish between suspected acute coronary syndrome (ACS) and stable angina as the management differs markedly. 'Acute coronary syndrome' includes unstable angina,

ST-segment elevation myocardial infarction (STEMI) and non-ST-segment elevation myocardial infarction (NSTEMI).

Symptoms which may indicate ACS include:

- Pain in the chest and/or other areas (e.g. arms, back or jaw) lasting longer than 15 minutes
- Chest pain associated with nausea and vomiting, marked sweating, breathlessness, haemodynamic instability or particularly a combination of these
- New onset chest pain, or abrupt deterioration in previously stable angina, with recurrent chest pain occurring frequently and with little or no exertion, and with episodes often lasting longer than 15 minutes

Response to glyceryl trinitrate (GTN) should not be used to make the diagnosis. Symptoms do not present differently between sexes, or ethnic groups.

Patients who present with acute chest pain should have a 12-lead ECG as soon as possible. A normal ECG does not exclude acute coronary syndrome.

If the resting 12-lead ECG shows regional ST-segment elevation or presumed new left bundle block local protocols should be followed, which will often be to send these patients for immediate primary percutaneous coronary intervention (PCI).

Patients whose ECG shows regional ST-segment depression, deep T-wave inversion or Q waves (known or presumed to be new) suggestive of an NSTEMI or unstable angina should be treated as acute coronary syndrome immediately and a 12 hour troponin done for diagnostic and prognostic purposes.

If the resting 12-lead ECG is normal ACS should not be excluded. Serial resting ECGs should be taken and any new changes acted upon.

Management of ACS should be started as soon as suspected. Pain relief should be given in the form of GTN (sublingual or buccal) and/or intravenous opioids. 300mg aspirin should be given to all, unless there is clear evidence of an allergy. Other antiplatelet agents are given dependent on local policy, and the presence of ECG changes.

Supplemental oxygen should only be given to those with saturations of less than 94%, who are not at risk of hypercapnic respiratory failure (target saturations 94-98%, 88-92% in those with COPD who are at risk of hypercapnic respiratory failure).

Full bloods should be done on admission to hospital, including a baseline troponin (I or T). This troponin is not used immediately for interpretation of the cause of chest pain, but can be used to show a rise in patients who have an elevated baseline troponin (for example those with renal impairment).

A second blood sample is taken for troponin I or T 10-12 hours after the onset of symptoms. A myocardial infarct can be diagnosed when there is a rise and/or fall of troponin (with at least one value above the 99th percentile of the upper reference limit) together with evidence of myocardial ischaemia (symptoms, new ST changes/LBBB/new Q waves, imaging demonstrating new loss of myocardium or regional wall motion abnormality).

You should be aware that there are other causes of raised troponin, including myositis, aortic dissection and pulmonary embolism.

Patients who give a good history for cardiac chest pain, but their troponin is negative, should be investigated for stable chest pain. It is in these patients where an exercise test is useful to determine the presence of ischaemia on exertion.

Cardiac angiography is indicated in those patients who have a positive exercise test, or who have had a NSTEMI or unstable angina. The timing is determined by individual risk

factors, but a troponin is always determined prior to considering angiography (except of course with STEMI).



[Q: 1782] OnExamination 2012 - Cardiology

Which one of the following cardiac enzymes would be expected to begin to increase between 12-24 hours after a myocardial infarction?

- 1- Aspartate transaminase (AST)
- 2- Creatine kinase (CK)
- 3- LDH
- 4- Troponin I
- 5- Troponin T

Answer & Comments

Answer: 1- Aspartate transaminase (AST)

AST starts to rise after 12 to 24 hours and lactate dehydrogenase (LDH) after five days.

CK begins to rise after four hours, as do troponins although the troponins are far more specific.



[Q: 1783] OnExamination 2012 - Cardiology

Primary prevention trials for the treatment of hypercholesterolaemia reveal a reduction in all-cause mortality following treatment with which of the following?

- 1- Fibrates
- 2- Fish oils
- 3- Nicotinic acid
- 4- Resins
- 5- Statins

Answer & Comments

Answer: 5- Statins

Primary prevention refers to the prevention of cardiovascular disease in subjects without pre-existing ischaemic heart disease (IHD).

Although many lipid-lowering agents have demonstrated reductions in cardiovascular mortality, the question refers to all-cause mortality.

WOSCOPS (pravastatin) and AFCAPS-TexCAPS (lovastatin) demonstrated reductions in overall mortality, not just cardiovascular mortality, following treatment with statins.

None of the other agents are proven to reduce all-cause mortality in primary prevention.

Fibrates are however well proven in secondary prevention trials (BECAIT, VA-HIT).



[Q: 1784] OnExamination 2012 - Cardiology

1. Aorta
2. Aortic valve
3. Left atrium
4. Left ventricle
5. Right atrium
6. Right ventricle
7. Mitral valve
8. Pulmonary artery
9. Pulmonary valve
10. Pulmonary vein
11. Tricuspid valve
12. Vena cava

In which order does blood flow through a normal heart?

- 1- 12-5-11-6-9-8-10-3-7-4-2-1
- 2- 12-5-11-6-8-9-10-3-7-4-2-1
- 3- 12-5-11-6-9-10-8-3-7-4-2-1
- 4- 12-5-7-6-9-8-10-3-11-4-2-1
- 5- 12-3-11-4-9-8-10-5-7-6-2-1

Answer & Comments

Answer: 1- 12-5-11-6-9-8-10-3-7-4-2-1

Understanding the relationship of the different parts of the heart can be made easy by following the blood trajectory - this knowledge will help you understand how certain drugs that work on one part of the heart can help with a problem in another part of the heart, and also help you diagnose certain problems (such as valve defects and the symptoms associated with it).

After circulating around the body, the blood is brought back to the heart by the (superior and inferior) vena cava.

It then passes into the right atrium, through the tricuspid valve into the right ventricle.

From there, it travels via the pulmonary valve into the pulmonary artery (remember, blood always leave the heart via an artery), through the lungs, back into the heart via the pulmonary vein and into the left atrium.

It then passes the mitral valve to enter the left ventricle, and exits into the aorta via the aortic valve.

All this movement is regulated by synchronised contraction of the myocardium (muscular part of the heart).



[Q: 1785] OnExamination 2012 - Cardiology

In a trial of a new drug the following results were obtained:

	Improved	Not improved
Treatment group	44	16
Placebo group	36	26

Which of the following statements regarding the statistical analysis or interpretation of the trial is true?

1- A Student's t test could be used

- 2- Pearson's co-efficient of linear regression would be an appropriate significance test
- 3- The data could be evaluated using the chi-square test
- 4- The numbers are too small to draw any conclusions
- 5- The results so obviously show the benefit of treatment that statistical analysis is not required

Answer & Comments

Answer: 3- The data could be evaluated using the chi-square test

These data would be ideal for a chi-square test. It is a 2 x 2 contingency table for which there is a special chi-squared formula that gives a value that can be looked up in a table giving the p value.

The Student's t test cannot be used as we are comparing proportions not means.

Pearson's co-efficient cannot be calculated as there is no linear regression to plot.

Nothing is ever so obvious that no statistical analysis is needed.



[Q: 1786] OnExamination 2012 - Cardiology

On auscultation of a patient's heart you hear a pan-systolic murmur.

With which of the following conditions is this murmur associated?

- 1- Aortic regurgitation
- 2- Coarctation of the aorta
- 3- Mitral stenosis
- 4- Pulmonary stenosis
- 5- Ventricular septal defect

Answer & Comments

Answer: 5- Ventricular septal defect

A pansystolic or holosystolic murmur extends from the first heart sound through to the second heart sound which is often hard to hear because of the murmur.

It is seen in septal defects and, more commonly, mitral regurgitation.



[Q: 1787] OnExamination 2012 - Cardiology

Which of the following mechanisms best explains the action of fibrates?

- 1- Bile acid sequestration
- 2- Decreases hepatic cholesterol synthesis
- 3- Increased lipoprotein lipase activity via PPAR-alpha
- 4- Increases peroxisomal beta-oxidation of fatty acids
- 5- Inhibits cholesterol absorption

Answer & Comments

Answer: 3- Increased lipoprotein lipase activity via PPAR-alpha

The effect of fibrates on the metabolism of triglyceride-rich lipoproteins is due to a PPAR-alpha-dependent stimulation of lipoprotein lipase and of apolipoprotein (apo)A-V and to an inhibition of apoC-III expression, whereas the increase in plasma HDL-cholesterol depends partly on an overexpression of apoA-I and apoA-II.

Reference:

Drugs Today (Barc). 2006 Jan;42(1):39-64



[Q: 1788] OnExamination 2012 - Cardiology

A 54-year-old obese man with a history of angina and hypertension presents with central crushing chest pain of two hours duration.

High flow oxygen, sublingual GTN and aspirin are administered and venous access is obtained. Whilst being attached to an ECG

monitor he collapses, with a doctor present, and the initial rhythm is pulseless ventricular tachycardia (VT). The external defibrillator is located two minutes away on another ward.

Which of the following is the most appropriate immediate treatment for this man?

- 1- A ventilation to compression ratio of 30:2 should be commenced
- 2- Await arrival of defibrillator, then deliver shock
- 3- Continuous chest compressions should be started
- 4- He should be given a precordial thump
- 5- Intravenous adrenaline should be given

Answer & Comments

Answer: 4- He should be given a precordial thump

The 2010 ALS guidelines state that if a patient has a monitored and witnessed VF/VT arrest in hospital, three quick successive (stacked) shocks should be given. Chest compressions should be started immediately after the third, with a compression to ventilation ratio of 30:2 for 2 minutes.

A precordial thump can be successful if given within seconds of the onset of a shockable rhythm. Delivery should not delay calling for help, or accessing a defibrillator, but would be indicated here whilst awaiting the defibrillator. Chest compressions should start immediately if it is unsuccessful.

Intravenous adrenaline would be given every 3-5 minutes once chest compressions had started.



[Q: 1789] OnExamination 2012 - Cardiology

A 50-year-old man with hypertension already on furosemide, ramipril and digoxin is found to have poor left ventricular function on echocardiogram.

Which antihypertensive should be added?

- 1- Carvedilol
- 2- Diltiazem
- 3- Doxazosin
- 4- Hydralazine
- 5- Nifedipine

Answer & Comments

Answer: 1- Carvedilol

This patient has hypertension and reduced ejection fraction on echo indicating an element of failure.

In these circumstances the most appropriate agent with evidence to support its use for reducing morbidity and mortality in failure would be the addition of a β -blocker.



[Q: 1790] OnExamination 2012 - Cardiology

A 26-year-old professional footballer collapses while playing football. He is rushed to the Emergency department, and is found to be in ventricular tachycardia.

He is defibrillated successfully and his 12 lead ECG demonstrates normal sinus rhythm, without ST segment changes.

Ventricular tachycardia recurs and despite prolonged resuscitation, he dies.

What is the most likely diagnosis?

- 1- Aortic stenosis
- 2- Cocaine intoxication
- 3- Hypertrophic cardiomyopathy
- 4- Myocardial infarction
- 5- Pulmonary embolism

Answer & Comments

Answer: 3- Hypertrophic cardiomyopathy

The history of sudden arrhythmia in a young, previously well, individual is suggestive of

hypertrophic cardiomyopathy; relatives should be screened for the condition.

There is no history to suggest drug abuse; aortic stenosis is rare in the absence of congenital or rheumatic heart disease.

A myocardial infarction and massive pulmonary embolism would have given electrocardiogram (ECG) changes.



[Q: 1791] OnExamination 2012 - Cardiology

A 17-year-old girl is short in stature for her age. She has not shown any changes of puberty. She has a webbed neck.

Her vital signs include temperature 36.6°C, respiratory rate 18/min, pulse 75 bpm and BP 165/85 mmHg.

On physical examination, she has a continuous murmur heard over both the front of the chest as well as her back. Her lower extremities are cool with poor capillary filling.

A chest radiograph reveals a prominent left heart border, no oedema or effusions, and rib notching.

Which of the following pathologic lesions best explains these findings?

- 1- Constriction of the aorta past the ductus arteriosus
- 2- Lack of development of the spiral septum and partial absence of conus musculature
- 3- Shortening and thickening of chordae tendineae of the mitral valve
- 4- Single large atrioventricular valve
- 5- Supravalvular narrowing in the aortic root

Answer & Comments

Answer: 1- Constriction of the aorta past the ductus arteriosus

She has coarctation of the aorta, and the constriction is postductal, allowing prolonged survival.

Her physical characteristics also suggest Turner syndrome (monosomy X).



[Q: 1792] OnExamination 2012 - Cardiology

A 75-year-old man with a history of anterior MI is taking amiodarone 400 mg/day for history of VT. He has a prolonged QT interval on his ECG.

What is the most appropriate management?

- 1- Admit to hospital for monitoring
- 2- Atenolol
- 3- Change amiodarone to flecainide
- 4- Continue with amiodarone
- 5- Discontinue amiodarone immediately

Answer & Comments

Answer: 5- Discontinue amiodarone immediately

In iatrogenic long QT, which is what this is likely to be, it is safer to stop the offending drug rather than add further drugs on board (for example, β -blockers even though atenolol is used for long QT).

Flecainide is contraindicated in this situation (CAST study).



[Q: 1793] OnExamination 2012 - Cardiology

A 60-year-old man with a past history of controlled hypertension presents with acute onset weakness of his left arm, that resolved over 12 hours. He had suffered two similar episodes over the last three months.

Examination reveals a blood pressure of 132/82 mmHg and he is in atrial fibrillation with a ventricular rate of 85 per minute. CT brain scan is normal.

What is the most appropriate management?

- 1- Amiodarone

- 2- Aspirin
- 3- Digoxin
- 4- Dipyridamole
- 5- Warfarin

Answer & Comments

Answer: 5- Warfarin

This patient has had three transient ischaemic attacks in the setting of atrial fibrillation. Compared to a person in sinus rhythm, a patient with atrial fibrillation has a fivefold increased risk of stroke (largely due to the increased risk of atrial thrombosis which can embolise to the brain). Stroke mortality is also higher than those without atrial fibrillation. Assessment is therefore given with regard to the need for anticoagulation.

Lower risk patients, as calculated by the CHADS₂-VASC score <2, do not need antithrombotic prophylaxis. They have a low annual risk of stroke, which is not significantly reduced by either warfarin or aspirin. Aspirin may be considered if there are other indications (for example, ischaemic heart disease or peripheral arterial disease).

CHADS₂-VASC Score:

Heart failure or ejection fraction <35% : 1

Hypertension: 1

Age: 65-74 years: 1, more than 75 years: 2

Diabetes: 1

Stroke, TIA or systemic emboli: 2

Vascular disease (previous MI, peripheral arterial disease, aortic plaque): 1.

Higher risk patients (CHADS₂-VASC 2+, annual stroke rate over 3%) should be considered for warfarin at a target INR of 2.5. Warfarin has been shown to have a relative risk reduction for stroke of 68% and death 33%. The minimum risk of stroke has been shown to occur in the INR range 2.0-3.0. There is an excess of two intracranial bleeds per year per thousand patients treated, usually associated

with an INR greater than 3 and uncontrolled hypertension.

There are however contraindications to warfarin, which include increased risk of bleeding, poor compliance and recurrent falls. Aspirin can be used as an alternative in these patients. Although less effective (20% relative risk reduction of stroke) it is simpler and less hazardous.

Cardioversion is indicated in select patients with AF, but there is a risk of systemic thromboembolism for those who have been in AF for more than two weeks. Patients with very recent onset AF require immediate assessment and treatment with heparin. If it is certain the AF has been present for two days or less, cardioversion can be attempted (electrical or pharmacological). Warfarin is not required if cardioversion is successful. If present for more than two days, warfarin is given for three weeks before cardioversion is attempted, and continued for at least four weeks following. Continuing warfarin should be considered for patients at high risk of recurrence (large left atrium, poor left ventricular function, hypertension) or previously symptomatic AF.

The most appropriate therapeutic strategy for this patient would be warfarin due to his high CHADS₂-VASC score. It is important to note, however, that anticoagulant therapy after an acute cerebral ischaemic event should be delayed until most of the deficit has resolved, or more than two weeks has elapsed for more severe strokes.

Digoxin may be indicated as a rate control agent, but will not reduce the risk of subsequent stroke. In the context of cerebrovascular disease, dipyridamole is only indicated if clopidogrel and/or aspirin are not tolerated.



[Q: 1794] OnExamination 2012 - Cardiology

A 27-year-old fit and healthy male has an ECG as part of his medical examination for employment as a pilot. The ECG reveals delta waves, indicating Wolff-Parkinson-White syndrome.

What is the most appropriate treatment for this patient?

- 1- Atenolol
- 2- Flecainide
- 3- Radio-frequency ablation
- 4- Reassurance
- 5- Verapamil

Answer & Comments

Answer: 4- Reassurance



[Q: 1795] OnExamination 2012 - Cardiology

A 37-year-old female patient who is undergoing treatment for breast cancer is admitted to the acute medical assessment unit with a seven day history of increasing breathlessness.

On examination she looks breathless. Her JVP is elevated with prominent "x" and "y" descents. The heart sounds are soft. A 12 lead ECG shows low voltage complexes.

Transthoracic echocardiography shows pericardial thickening with a restrictive Doppler pattern.

With regard to the investigation findings, what is the most likely cause of this patient's pericardial disease?

- 1- Dermatomyositis
- 2- Mediastinal irradiation
- 3- Scleroderma
- 4- SLE
- 5- Uraemia

Answer & Comments

Answer: 2- Mediastinal irradiation

All the options listed here are causes of pericardial disease.

The echo findings in this case are strongly suggestive of constrictive pericarditis where dense fibrous tissue replaces the normal pericardium.

Common causes include irradiation, TB and any cause of purulent pericarditis.

Therefore the correct answer is B.



[Q: 1796] OnExamination 2012 - Cardiology

A 67-year-old man presents to the Emergency department with uncontrolled nausea and vomiting.

He has a long history of COPD for which he takes high dose Seretide and theophylline tablets and has recently been prescribed some antibiotics by his GP for an exacerbation.

On examination his BP is 142/72 mmHg, his pulse is 92 and regular. Auscultation of the chest reveals wheeze and coarse crackles.

Investigations show:

Haemoglobin 13.4 g/dl(13.5-17.7)

White cell count $7.1 \times 10^9/L$ (4-11)

Platelets $172 \times 10^9/L$ (150-400)

Sodium 137 mmol/l (135-146)

Potassium 3.0 mmol/l (3.5-5)

Creatinine 115 $\mu\text{mol/l}$ (79-118)

Which of the following antibiotics is he most likely to have been prescribed?

- 1- Amoxicillin
- 2- Azithromycin
- 3- Cefuroxime
- 4- Clarithromycin
- 5- Doxycycline

Answer & Comments

Answer: 4- Clarithromycin

This patient is showing symptoms of theophylline toxicity, and the most likely cause of toxicity is co-prescription of a CYP3A4 inhibitor. Of the options listed, only clarithromycin is a potent 3A4 inhibitor. Azole antibiotics, amiodarone, fluoxetine and cimetidine are other examples.

Azithromycin is a macrolide but is not a significant inhibitor of 3A4. Whilst case reports exist of azithromycin precipitating drug accumulation it is much less likely to do so than clarithromycin or erythromycin.

Amoxicillin, doxycycline and cephalosporins should not lead to theophylline accumulation.



[Q: 1797] OnExamination 2012 - Cardiology

For which of the following are β blockers not recommended as first line therapy?

- 1- Chronic heart failure
- 2- Hypertension
- 3- Angina
- 4- Myocardial infarction
- 5- Permanent atrial fibrillation with rapid ventricular rate

Answer & Comments

Answer: 2- Hypertension

In its 2006 guidelines the National Institute for Health and Clinical Excellence (NICE) advise against using β -blockers as routine first line therapy for uncomplicated hypertension.

Review of several randomised controlled trials suggested that first line β -blockers were not as good at decreasing mortality as other classes of antihypertensive drugs and were less well tolerated.

Reference:

*B-blockers for hypertension currently published in
The Cochrane Database of Systematic Reviews
2010 Issue 11*



[Q: 1798] OnExamination 2012 -
Cardiology

Which of the following mechanisms best explains the action of simvastatin?

- 1- Activates PPAR-alpha
- 2- Bile acid sequestration
- 3- Decreases hepatic cholesterol synthesis
- 4- Increases peroxisomal beta-oxidation of fatty acids
- 5- Inhibits cholesterol absorption

Answer & Comments

Answer: 3- Decreases hepatic cholesterol synthesis

Most circulating cholesterol is manufactured internally, in amounts of about 1000 mg/day, via carbohydrate metabolism through the HMG-CoA reductase pathway.

Statins act by competitively inhibiting HMG-CoA reductase, the first committed enzyme of the HMG-CoA reductase pathway.



[Q: 1799] OnExamination 2012 -
Cardiology

A 50-year-old man is being treated for hypertension and has been told by his dentist that he has gingival hyperplasia.

Which of the following medications is the most likely to be the cause?

- 1- Atorvastatin
- 2- Carvedilol
- 3- Doxazosin
- 4- Nifedipine
- 5- Telmisartan

Answer & Comments

Answer: 4- Nifedipine

Three drugs to remember that are associated with gingival hyperplasia are phenytoin, ciclosporin and nifedipine.



[Q: 1800] OnExamination 2012 -
Cardiology

A 65-year-old is investigated for dyspnoea and is shown to have an ejection fraction of 45% on echocardiography.

How is left ventricular ejection fraction calculated?

- 1- Cardiac output/stroke volume
- 2- End diastolic volume/end systolic volume
- 3- End diastolic volume/stroke volume
- 4- End systolic volume/end diastolic volume
- 5- Stroke volume/end diastolic volume

Answer & Comments

Answer: 5- Stroke volume/end diastolic volume

The left ventricle pumps only a fraction of the blood it contains.

The ejection fraction is the amount of blood pumped (stroke volume = end diastolic volume - end systolic volume) divided by the amount of blood the ventricle contains (end diastolic volume).

A normal ejection fraction is more than 55% of the blood volume.



[Q: 1801] OnExamination 2012 -
Cardiology

A 42-year-old male admitted with dyspnoea is noted to have a murmur suggestive of mitral stenosis.

The presence of which of the following clinical signs suggests that the mitral valve is mobile?

- 1- A soft first heart sound
- 2- A third heart sound
- 3- Fourth heart sound
- 4- Loud second heart sound
- 5- Opening snap

Answer & Comments

Answer: 5- Opening snap

Features of mitral stenosis include the loud first heart sound, opening snap and if in sinus rhythm, a pre-systolic accentuation.

Calcification of the valve results in immobility and loss of the opening snap.



[Q: 1802] OnExamination 2012 - Cardiology

A 72-year-old man is admitted with fast atrial fibrillation but is receiving treatment with digoxin. An inadequate dose is suspected. A sample of blood is drawn six hours after the last dose of digoxin and a plasma concentration is requested.

Which of the following factors explains the six hour wait before measuring the digoxin concentration?

- 1- Enterohepatic circulation
- 2- The rate of absorption
- 3- The rate of clearance
- 4- The rate of distribution
- 5- The rate of elimination

Answer & Comments

Answer: 4- The rate of distribution

A blood sample needs to be drawn at least six hours after administration of digoxin to ensure adequate distribution. A useful link discussing some of the pharmacodynamics of Digoxin and the relevance of monitoring can be viewed in this pdf file.



[Q: 1803] OnExamination 2012 - Cardiology

Which of the following findings is the most specific for a diagnosis of myocardial infarction?

- 1- An akinetic area of LV wall motion on ECHO
- 2- Elevated cardiac enzymes
- 3- Evolution of Q waves on ECG
- 4- History of severe chest pain
- 5- ST elevation on ECG

Answer & Comments

Answer: 3- Evolution of Q waves on ECG

Cardiac enzymes may be elevated in pulmonary embolism (PE), renal failure and raised ST segments associated with pericarditis.

Akinetic wall motion on the echo may occur with any regional disease process like amyloid, etc.

The evolution of Q waves is the most suggestive of an infarct.



[Q: 1804] OnExamination 2012 - Cardiology

A 17-year-old female is found to have a cardiac murmur characterised by a mid-systolic click.

An echocardiogram reveals mitral insufficiency with upward displacement of one leaflet. There is also aortic root dilation to 4 cm. She has a dislocated right ocular crystalline lens. She dies suddenly and unexpectedly.

The medical examiner finds a prolapsed mitral valve with elongation, thinning, and rupture of chordae tendineae.

A mutation involving which of the following genes is most likely have be present in this patient?

- 1- Beta-myosin

- 2- CFTR
- 3- FGFR
- 4- Fibrillin
- 5- Spectrin

Answer & Comments

Answer: 4- Fibrillin

Marfan syndrome is a connective tissue disorder that is associated with floppy mitral valve and also with cystic medial necrosis that predisposes to aortic dissection.

Abnormalities of the beta-myosin gene may be associated with some forms of dilated cardiomyopathy.

The CFTR gene is associated with cystic fibrosis.

The obstructive lung disease from widespread bronchiectasis that results from cystic fibrosis involving the lung can lead to pulmonary hypertension with cor pulmonale.

The fibroblast growth factor receptor (FGFR) gene mutations can be associated with skeletal dysplasias.

The spectrin gene mutation can be associated with red cell membrane abnormalities associated with hereditary spherocytosis.

Anaemias in adults with this condition are not typically severe, though anaemias in general can increase cardiac stress.



[Q: 1805] OnExamination 2012 - Cardiology

A randomised, double-blind, placebo controlled trial of a cholesterol-lowering drug in the primary prevention of coronary heart disease is reported.

1000 subjects are treated with the active drug, and 1000 are given placebo. They are followed up over a five year period and 100 individuals

in the placebo group and 80 in the treatment group suffer a myocardial infarction (MI).

What is the annual percentage risk of myocardial infarction in the group treated with placebo?

- 1- 0.5%
- 2- 2%
- 3- 5%
- 4- 8%
- 5- 10%

Answer & Comments

Answer: 2- 2%

In the five years 100 patients in the placebo group develop an MI.

Assuming this is spread evenly across the years this means that 20 patients (out of 1000) suffer an MI each year.

The annual risk is therefore $20/1000 = 0.02$ which, expressed as a percentage is 2.



[Q: 1806] OnExamination 2012 - Cardiology

You have shown an interest in paediatric cardiology and your clinical supervisor has arranged for you to attend some clinics with the visiting paediatric cardiologist.

You have a very interesting session and you were particularly interested in the patients you saw with ventricular septal defects (VSDs). After this session you have been stimulated to do some self-directed learning and want to read about VSDs. As part of your reading you learn about the anatomical classification of VSDs and the frequency of each type.

During your reading, what did you discover to be the most common site for a VSD?

- 1- Muscular - inlet
- 2- Muscular - outlet
- 3- Muscular - trabecular

- 4- Perimembranous
5- None of the above

Answer & Comments

Answer: 4- Perimembranous

There are a number of different classifications for VSDs.

One easy way to group these is based on the division of the ventricular septum into membranous and muscular portions.

Options A, B and C are the subdivision of the muscular VSDs and occur in 5%, 5-10% and 5-10% respectively.

Perimembranous VSDs account for 70-80% of VSDs and are situated between the inlet and outlet portions of the septum.



[Q: 1807] OnExamination 2012 - Cardiology

An 84-year-old female with permanent atrial fibrillation, ischaemic heart disease with well preserved left ventricular systolic function and mild COPD is due elective surgery for a large abdominal aortic aneurysm.

Choose the most appropriate drug from the list to reduce peri-operative cardiac risk in this patient.

- 1- Atenolol
2- Carvedilol
3- Metoprolol
4- Oxprenolol
5- Sotalol

Answer & Comments

Answer: 1- Atenolol

The ESC guidelines in 2009 for peri-operative management of patients undergoing high risk vascular surgery recommends prophylactic β -blockers for high risk vascular surgery (including those patients with COPD).

Bisoprolol is probably the best clinical choice in this case, but is not on the list.

Atenolol is the best choice from this list - it is cardio-selective and long acting - reducing risk of postoperative myocardial ischaemia and tachycardia.

Carvedilol is non-selective and so has greater risk of exacerbating COPD.

Oxprenolol is undesirable because of its intrinsic sympathomimetic properties.

Metoprolol though selective is shorter acting.

Sotalol may be appropriate for paroxysmal AF, but not permanent AF.



[Q: 1808] OnExamination 2012 - Cardiology

A 16-year-old female attends casualty 15 hours after ingesting approximately 30 g of paracetamol and 2 g of dihydrocodeine.

On examination, she is drowsy with a Glasgow coma scale of 15. Her pulse is 100 beats per minute, blood pressure is 110/66 mmHg and she has pinpoint pupils, with saturations of 96% on air.

What is the most appropriate treatment for this patient?

- 1- 10% Dextrose infusion
2- Activated charcoal by mouth
3- Gastric lavage
4- N-acetylcysteine intravenously
5- Naloxone intravenously

Answer & Comments

Answer: 4- N-acetylcysteine intravenously

This patient has taken a significant overdose of paracetamol, and is presenting late at 15 hours.

She is at risk of hepatocellular damage and needs to be commenced on an infusion of

intravenous N-acetylcysteine immediately. It is continued for 30 hours and sometimes beyond this, depending on results of prothrombin time, liver function tests, urea and electrolytes, and glucose.

Activated charcoal is given to patients presenting within one hour of overdose.

Flumazenil is reserved for reversal of benzodiazepine-induced respiratory depression.

Naloxone is used for opiate-induced respiratory depression.



[Q: 1809] OnExamination 2012 - Cardiology

A 70-year-old man is admitted to the cardiology ward with a diagnosis of Streptococcus bovis infective endocarditis.

Which of the following investigations would be indicated?

- 1- Colonoscopy
- 2- Cystoscopy
- 3- Lymph node biopsy
- 4- Sialogram
- 5- Thoracoscopy

Answer & Comments

Answer: 1- Colonoscopy

The association between Streptococcus bovis bacteraemia and colonic neoplasia is well described.

The consensus of opinion is that all subjects should undergo evaluation including investigation of the gastrointestinal tract.

If investigation is clear then further tests should be performed only where there are symptoms or signs to suggest malignancy in other areas.

Reference:

Arch Surg. 2004;139:760-765



[Q: 1810] OnExamination 2012 - Cardiology

A 69-year-old man presents with sudden onset tearing chest pain that radiated through to his back.

He is sweaty. His BP is 140/90 mmHg and pulse 95 bpm. A CXR shows a widened mediastinum and CT scan confirms an aortic dissection of the descending aorta.

Which of the following is the most appropriate initial management of this patient?

- 1- Immediate surgical referral
- 2- IV labetalol
- 3- Observe on high dependency unit
- 4- Refer for cardiac catheterisation
- 5- Verapamil orally

Answer & Comments

Answer: 2- IV labetalol

Advances in the understanding of this disease have established that lesions limited to the descending aorta (type B) generally have better survival compared with those involving the ascending aorta.

Current recommendations support the use of betablockers as the initial management with an increasing number of endovascular and surgical techniques being used as local expertise dictates.

Reference:

Circulation. 2003;108:II-312



[Q: 1811] OnExamination 2012 - Cardiology

A 34-year-old male presents with palpitations. The ECG shows a slurred upstroke in the QRS complexes in the chest leads.

What is the treatment of choice?

- 1- Amiodarone
- 2- Aspirin

- 3- Diltiazem
- 4- Radiofrequency ablation
- 5- Warfarin

Answer & Comments

Answer: 4- Radiofrequency ablation

This patient has Wolff-Parkinson-White syndrome as suggested by the delta wave on ECG.

Anticoagulation is not indicated.

Risk of arrhythmia after ablation is of the order of 7% over five years.



[Q: 1812] OnExamination 2012 - Cardiology

A 35-year-old female presents with chest pain on exertion.

On examination she has yellow discolouration of her palmar creases and a diagnosis of remnant hyperlipidaemia (type III hyperlipidaemia) is made.

What is the cause of this hyperlipidaemia?

- 1- Apo CIII homozygosity
- 2- Apo E-2 homozygosity
- 3- LCAT deficiency
- 4- LDL receptor deficiency
- 5- Lipoprotein lipase deficiency

Answer & Comments

Answer: 2- Apo E-2 homozygosity

Remnant hyperlipidaemia is associated with:

Hypercholesterolaemia
Hypertriglyceridaemia
Palmar xanthomata

Early onset of cardiovascular disease.

The genotype of the condition is apo E-2/E-2 and occurs with a frequency of 1:100.

Low density lipoprotein (LDL) receptor deficiency is associated with familial hypercholesterolaemia.

Lipoprotein lipase deficiency is rare and associated with marked hypertriglyceridaemia.



[Q: 1813] OnExamination 2012 - Cardiology

A 60-year-old man takes atenolol for hypertension.

Which of the following side effects is he most likely to be aware of two hours after taking atenolol?

- 1- Fatigue
- 2- Hesitancy of micturition
- 3- Nausea
- 4- Orthostatic hypotension
- 5- Somnolence

Answer & Comments

Answer: 1- Fatigue

Atenolol is a water soluble β -blocker, taken once daily and is not associated with drowsiness/sleep disturbance like the lipid-soluble β -blockers.

It is not associated with nausea or hesitancy of micturition and would be unlikely to produce significant postural hypotension in a hypertensive subject.

However, fatigue is a frequent side effect which typically is felt two hours and beyond after taking the drug.



[Q: 1814] OnExamination 2012 - Cardiology

A 30-year-old man presented with a history of transient loss of consciousness and palpitation. His ECG showed ventricular tachycardia (VT).

Which one of the following treatments should be avoided?

- 1- Adenosine
- 2- Amiodarone
- 3- DC cardioversion
- 4- Flecainide
- 5- Verapamil

Answer & Comments

Answer: 5- Verapamil

Verapamil may cause fatal hypotension in VT (due to negative inotropic and peripheral vasodilatory effects).

Flecainide should be used with caution because it may produce an incessant form of VT which is difficult to control.

Adenosine is used to differentiate supraventricular tachycardia (SVT) with right (or left) bundle branch block from VT.



[Q: 1815] OnExamination 2012 - Cardiology

A 65-year-old man was advised to start oral digoxin at a dose of 250 µg daily. His physician explained that the full effect of this treatment would not be apparent for at least a week.

Which one of the following pharmacokinetic variables did the physician use to give this explanation?

- 1- Bioavailability
- 2- Half life
- 3- Plasma protein binding
- 4- Renal clearance
- 5- Volume of distribution

Answer & Comments

Answer: 2- Half life

Digoxin follows first order kinetics and has a half life of 1.6 days in a patient with normal renal function.

Sixty five per cent of the drug absorbed remains in the system after one day.

Subsequent doses gradually accumulate until a steady state is achieved after four to five days.



[Q: 1816] OnExamination 2012 - Cardiology

Which of the following antimicrobials is associated with prolongation of the QT interval?

- 1- Cefuroxime
- 2- Co-amoxiclav
- 3- Erythromycin
- 4- Gentamicin
- 5- Isoniazid

Answer & Comments

Answer: 3- Erythromycin

The macrolides are associated with a prolongation of the QT interval.

Other antimicrobials associated with prolonged QT include quinine and levofloxacin.



[Q: 1817] OnExamination 2012 - Cardiology

Your next patient in the care of the elderly clinic is a 77-year-old man with a history of hypertensive heart disease leading to congestive cardiac failure.

Unfortunately, in the past few months his symptoms have worsened and he is becoming house bound. His wife accompanied him and is worried about his state. She asks you directly 'how long has he got left'. You tell his wife that certain test results can suggest a worse prognosis.

From the list, which blood test result suggests a worse prognosis in heart failure?

- 1- Hypocalcaemia
- 2- Hyponatraemia
- 3- Low serum BNP/ NT-pro-BNP
- 4- Low serum uric acid
- 5- Polycythaemia

Answer & Comments

Answer: 2- Hyponatraemia

Heart failure is a chronic condition with a high morbidity and mortality.

There are a number of clinical features and biochemical parameters which provide useful prognostic information.

Prognostic markers include:

- High BNP/NT-pro-BNP
- Anaemia
- Hyponatraemia
- Increased uric acid.

Serum calcium is not a useful in prognosis in heart failure.



[Q: 1818] OnExamination 2012 - Cardiology

A male infant is rushed to the Emergency department by his parents with a short history of blue lips and breathlessness. His parents are frantic and you arrange admission to the paediatric ward.

Two days later you decide to go to the ward to see how the patient is doing. You look through the notes and find a report from a transthoracic echocardiogram. The report mentions displacement of the tricuspid valve towards the apex, a small 'atrialised' and hypoplastic RV, an ASD and tricuspid incompetence.

Based on the echo findings, what is the likely diagnosis?

- 1- Ebstein's anomaly
- 2- Hypoplastic left ventricle
- 3- Tetralogy of Fallot
- 4- Truncus arteriosus
- 5- None of the above

Answer & Comments

Answer: 1- Ebstein's anomaly

Ebstein's anomaly is congenital heart defect which has been linked with maternal lithium intake.

There is variable anatomy but the most common findings are a hypoplastic (atrialised) RV, apical displacement of the septal and posterior tricuspid valve leaflets, ASD.

Wolff-Parkinson-White syndrome occurs in around 15% of the patients.

Presentation depends on the extent of the defects and can be at any stage of childhood with heart failure or arrhythmias.



[Q: 1819] OnExamination 2012 - Cardiology

You are investigating the use of novel markers which may show myocardial damage within the first three hours after myocardial infarction to see if this may improve early diagnosis of damage.

Which of the following is the most appropriate marker?

- 1- CKMB
- 2- Glycogen phosphorylase isoenzyme BB (GPBB)
- 3- LDH
- 4- Troponin I
- 5- Troponin T

Answer & Comments

Answer: 2- Glycogen phosphorylase isoenzyme BB (GPBB)

GPBB is an isoenzyme of glycogen phosphorylase which exists in cardiac muscle. By three hours post myocardial infarction it has risen significantly. As such it is an appropriate marker for early cardiac muscle injury.

Troponin rises by hour six post-myocardial infarction and the steepest increase in troponin continues until around hour 12. Troponin assays are widely available and cost-effective and as such it is the investigation of choice for ischaemic chest pain.

Lactate dehydrogenase (LDH) rises late, some two to five days post-infarct.



[Q: 1820] OnExamination 2012 - Cardiology

A 62-year-old male is admitted with an inferior myocardial infarction (MI) and receives thrombolysis, aspirin, atenolol, simvastatin and lisinopril. His ECG shows good ST segment resolution.

The following day he develops some pain in the legs and a dusky discolouration of the lower limbs. On closer examination there is a diffuse petechial rash over the lower legs, particularly the feet, but all peripheral pulses are palpable.

Investigations reveal:

Haemoglobin 13.3 g/dl(12-16)

Platelets 145 x 10⁹/L (150-400)

White cell count 12.1 x 10⁹/L (4-11)

Neutrophils 6.5 x 10⁹/L (1.5-7)

Lymphocytes 3.5 x 10⁹/L (1.5-4)

Eosinophils 1.2 x 10⁹/L (0.04-0.4)

IgE antibody 3 kU/l (<2)

Which of the following is the most likely cause for his current problems?

- 1- Allergic reaction to thrombolysis
- 2- Aspirin allergy
- 3- Cholesterol emboli
- 4- Peripheral vascular disease
- 5- Polyarteritis nodosa

Answer & Comments

Answer: 3- Cholesterol emboli

This patient is an arteriopath as suggested by the acute MI, and one day after thrombolysis develops a petechial rash in the lower limbs with raised white cell count - marked eosinophilia and raised IgE.

Rather than allergy, this suggests cholesterol embolisation syndrome.



[Q: 1821] OnExamination 2012 - Cardiology

A 26-year-old female with a small ventriculo-septal defect (VSD) presents in the sixth week of pregnancy. She has been told that she would need antibiotic prophylaxis for dental surgery, and various other procedures.

She asks you to tell her whether she will have to take this during her pregnancy, and if so, at which point it will be needed.

- 1- Antibiotic prophylaxis is not indicated
- 2- At delivery
- 3- Onset of labour
- 4- Second trimester
- 5- Third trimester

Answer & Comments

Answer: 1- Antibiotic prophylaxis is not indicated

Infective endocarditis (IE) is a rare condition, but one which carries significant morbidity and mortality. It may arise following bacteraemia in any patient, but those with a predisposing cardiac lesion and at an

increased risk. In previous years, at risk patients have been given antibiotic prophylaxis before certain interventional procedures to reduce the risk of developing IE. However, in recent years the lack of a robust evidence base has led to this practice being questioned. In light of this, NICE issued guidance in 2008.

These guidelines highlight that the patients at risk of developing IE are those with:

acquired valvular heart disease (stenosis or regurgitation),
valve replacement,
structural congenital heart disease (including surgically corrected or palliated structural conditions, but excluding isolated atrial septal defect, fully repaired ventricular septal defect or fully repaired patent ductus arteriosus and closure devices that are judged to be endothelialised),
previous infective endocarditis,
hypertrophic cardiomyopathy.

In these patients any episodes of infection should be fully investigated and treated promptly to reduce the risk of endocarditis developing. However, prophylaxis is not recommended for undergoing dental procedures, or procedures at the following sites:

- upper and lower gastrointestinal tract,
- genitourinary tract (including childbirth),
- upper and lower respiratory tract (including ENT),

Chlorhexadine mouthwash is also not recommended.

The only recommendation for antibiotics is if an at-risk patient is undergoing a gastrointestinal or genitourinary procedure at a site where there is a suspected infection - in

these cases an antibiotic should be given that covers organisms that cause IE.

Reference:

CG64 Prophylaxis against infective endocarditis
NICE Guidelines



[Q: 1822] OnExamination 2012 -
Cardiology

A 52-year-old lady presented with a history of crushing central chest pain, sweating and dyspnoea.

An ECG confirms acute myocardial infarction with ST elevation in leads V2-V4 and ST depression in leads II and III.

Which of the following would be a contraindication to thrombolysis in this lady?

- 1- History of peptic ulcer disease
- 2- Intracranial neoplasm
- 3- Menstruation
- 4- Pre-proliferative diabetic retinopathy
- 5- Ischaemic stroke 2 years previously

Answer & Comments

Answer: 2- Intracranial neoplasm

Contraindications to thrombolysis include:

Intracranial neoplasm as here
Ischaemic stroke within six months
Pregnancy
Active internal bleeding
Aortic dissection
Recent significant head injury
Severe and uncontrolled hypertension.



[Q: 1823] OnExamination 2012 -
Cardiology

A 57-year-old female school cleaner is undergoing investigation for breathlessness.

Which of the following is not in keeping with a diagnosis of constrictive pericarditis?

- 1- Ascites

- 2- Elevated JVP with absent y descent
- 3- Orthopnoea
- 4- Peripheral oedema
- 5- Previous cardiac surgery

Answer & Comments

Answer: 2- Elevated JVP with absent y descent

Constrictive pericarditis typically impedes late diastolic ventricular filling, which produces an elevated jugular venous pressure (JVP), with prominent x and y descent.

Pulsus paradoxus is a variable finding, unless a pericardial effusion with an abnormally elevated pressure exists.

Other signs include:

- Oedema
- Ascites
- Hepatomegaly
- Orthopnoea
- Dyspnoea.

Constrictive pericarditis may be a subtle cause of dyspnoea after cardiac surgery.



[Q: 1824] OnExamination 2012 - Cardiology

A 65-year-old woman presents with heart failure. Her echocardiogram shows a restrictive cardiomyopathy but with structurally normal valves.

Which one of the following is the most likely cause?

- 1- Amyloidosis
- 2- Coxsackie infection
- 3- Down's syndrome
- 4- Marfan's syndrome
- 5- Turner's syndrome

Answer & Comments

Answer: 1- Amyloidosis

The diagnosis is amyloidosis which typically causes an infiltrative restrictive cardiomyopathy in patients of this age group.

Other causes include:

- Sarcoidosis
- Radiotherapy
- Systemic sclerosis
- Carcinoid syndrome.

Coxsackie produces a viral myocarditis with the likelihood of a dilated appearance on echo.

Marfan's is likely to cause valvular regurgitant defects and a dilated cardiomyopathy.

Down's syndrome is more likely to be associated with AV canal defects and consequent dilatation.

Turner's syndrome is associated with atrial septal defects and coarctation and bicuspid valvular defects.



[Q: 1825] OnExamination 2012 - Cardiology

A 40-year-old man received an orthotopic cardiac transplant seven years ago to treat a dilated cardiomyopathy. Since that time he has been healthy, with no episodes of rejection or infection. Over the next year, however, he develops fatigue with exercise. He has worsening pedal oedema and orthopnoea.

On physical examination, his vital signs are temperature 36.3°C, pulse 78, respiratory rate 16, and BP 130/70 mm Hg. There are no murmurs, rubs, or gallops audible. Bibasilar crackles in the lungs are audible.

Which of the following conditions is most likely to account for these findings?

- 1- Angiosarcoma
- 2- Coronary arteriopathy
- 3- Mitral valvular stenosis
- 4- Myocarditis

5- Pulmonary hypertension

Answer & Comments

Answer: 2- Coronary arteriopathy

By five years following cardiac transplantation, nearly all patients have some degree of small coronary vascular narrowing.

Myocarditis is unlikely to be present in the absence of rejection or infection.



[Q: 1826] OnExamination 2012 - Cardiology

Which of the following is true regarding mitral stenosis?

- 1- Doppler U/S is usually inaccurate in determining severity
- 2- In AF, the opening snap disappears
- 3- It is tolerated well in pregnancy
- 4- The opening snap is not heard when the mitral valve is heavily calcified
- 5- There is characteristically a low wedge pressure

Answer & Comments

Answer: 4- The opening snap is not heard when the mitral valve is heavily calcified

Mitral stenosis is typically a consequence of childhood rheumatic fever, but congenital disease is well recognised.

It is associated with a tapping apex beat, a loud S1, opening snap and mid-diastolic rumble with pre-systolic accentuation in those in sinus rhythm.

The opening snap is characteristically lost with heavy valvular calcification.

In particular mitral stenosis is poorly tolerated in pregnancy due to volume overload.

It is well characterised by Doppler echocardiography.



[Q: 1827] OnExamination 2012 - Cardiology

Following a lecture on cardiac physiology, your consultant asks you during a ward round *to calculate how much blood (in ml) Mr. Smith's ventricle ejects every time his heart beats*. He gives you the following values:

Blood pressure: 136/90 mmHg units

Cardiac output: 5000 ml/minute

Heart Rate: 72/minute

Urine output: 5 ml/kg/hr

- 1- 5ml
- 2- 20ml
- 3- 50ml
- 4- 70ml
- 5- 130ml

Answer & Comments

Answer: 4- 70ml

Cardiac output (CO), or the volume of blood being pumped by the heart in one minute, is essential for normal function. It is a reflection of how well the rest of the body is being perfused, and therefore how well the body can work (perfusion enables energy production). It is multifactorial, and these can be calculated using stroke volume (SV) and heart rate (HR):

$$CO = HR \times SV$$

If 5000 ml is pumped in one minute, with 72 beats of the heart, each beat will pump around $5000/72 = 69.4$ ml.

This relationship can be seen at all times: indeed, when one of the parameters in the equation changes, the others change accordingly, to maintain the CO within a tight range.

In this situation, the blood pressure, and urine output were both useless information, as all that was needed was the cardiac output

(which in a normal adult ranges from 5-8 L/min), and the heart rate.



[Q: 1828] OnExamination 2012 - Cardiology

A young boy is born with a heart murmur that is subsequently diagnosed as Ebstein's anomaly.

Which of the following drugs, taken by the mother, may have contributed to this case of congenital heart disease?

- 1- Amiodarone
- 2- Carbimazole
- 3- Lithium
- 4- Phenytoin
- 5- Warfarin

Answer & Comments

Answer: 3- Lithium

Exposure to lithium in utero is associated with Ebstein's anomaly.



[Q: 1829] OnExamination 2012 - Cardiology

A 55-year-old man with type 2 diabetes mellitus and ischaemic heart disease has been researching the internet!

He asks your opinion on laser transmyocardial revascularisation.

Which of the following statements about this technique is true?

- 1- Avoids the need for major surgery
- 2- Damages the endocardium
- 3- Involves destruction of coronary stenoses
- 4- Is of particular use in severe proximal coronary artery disease
- 5- Stimulates collateral vessel formation

Answer & Comments

Answer: 2- Damages the endocardium

Open chest surgery is undertaken, during which laser holes are punched from the epicardial surface into areas of suspected ischaemic or hibernating ventricular muscle. The process is not fully understood.

The epicardial end of the hole heals up leaving artificial channels communicating with the ventricular chamber and effectively forming new coronary vessels.

Laser transmyocardial revascularisation has potential in distal disease such as in diabetes.

Angioplasty and coronary artery bypass graft (CABG) are useful in proximal disease.



[Q: 1830] OnExamination 2012 - Cardiology

A 27-year-old fit and healthy male has an ECG as part of his medical examination for employment as a pilot. The ECG reveals delta waves, indicating Wolff-Parkinson-White syndrome.

What is the most appropriate treatment for this patient?

- 1- Atenolol
- 2- Flecainide
- 3- Radio-frequency ablation
- 4- Reassurance
- 5- Verapamil

Answer & Comments

Answer: 4- Reassurance

WPW is a relatively common cardiological abnormality occurring in approximately 0.1 to 3% of the population.

It is due to an accessory pathway and although most subjects are asymptomatic, there is the small risk of sudden death from

tachyarrhythmias (<0.6%). Treatment is based on risk stratification.

One of the pointers is symptomatology, and also electrophysiological studies (EPS). Generally, in an asymptomatic individual it is uncertain whether any intervention or indeed any EPS is required.

Radiofrequency ablation is the treatment of choice in those identified to be at risk.



[Q: 1831] OnExamination 2012 - Cardiology

A 67-year-old male is admitted with central chest pain of sudden onset which radiates through to his back.

His blood pressure is 160/70 mmHg in his right arm and 140/60 mmHg in his left arm. He has electrocardiographic (ECG) changes in leads II, III and AVF showing ST elevation of 2 mm.

What is the most likely diagnosis?

- 1- Coarctation of the aorta
- 2- Dissecting thoracic aortic aneurysm
- 3- Inferior myocardial infarct
- 4- Pancreatitis
- 5- Perforated duodenal ulcer

Answer & Comments

Answer: 2- Dissecting thoracic aortic aneurysm

This history is suggestive of a dissecting thoracic aortic aneurysm.

The ECG changes of inferior myocardial infarct suggest that the aneurysm has dissected the right coronary artery at its ascending aortic ostium. An ascending aortic dissection needs immediate surgery. Whilst en route to surgery, beta-blockade to control hypertension is appropriate.

An inferior myocardial infarct is high in the differential - however thrombolysis will kill a patient with an aortic dissection.

Coarctation can give different blood pressures in either arm but is a chronic condition. Ulcer and pancreatitis may mimic a heart attack, but with a normal ECG.



[Q: 1832] OnExamination 2012 - Cardiology

A 52-year-old man attends a GP clinic. He has a strong family history of ischaemic heart disease, smokes 10 cigarettes per day and drinks approximately 20 units of alcohol per week.

On examination, he is obese with a BMI of 32 kg/m² and has a blood pressure of 152/88 mmHg.

His investigations reveal that he has a fasting plasma glucose of 10.5 mmol/L (3.0-6.0), HbA1c of 7.8% or 62 mmol/mol (range 3.8-6.4%; 18-46 mmol/mol) and his cholesterol concentration is 5.5 mmol/L (<5.2).

Which of the following would be expected to be most effective in reducing his cardiovascular risk?

- 1- Improve glycaemic control with metformin
- 2- Improve hypertensive control with ramipril
- 3- Reduce cholesterol with simvastatin
- 4- Stop smoking
- 5- Weight loss with Xenical

Answer & Comments

Answer: 4- Stop smoking

This patient has hypertension and is diabetic as suggested by the elevated fasting plasma glucose.

It has been established that:

Metformin has been shown to reduce CV mortality in obese diabetics (UKPDS)

Ramipril reduces CV risk in hypertensive diabetics (HOPE) and

Statins reduce CV mortality (4S, HPS).

However, none of these interventions are as effective as stopping smoking in reducing CV risk.

There is no evidence that non-surgical weight loss per se reduces CV mortality, although good studies are lacking.

Gastric bypass surgery reduces cardiovascular events.



[Q: 1833] OnExamination 2012 - Cardiology

An 80-year-old male presented with palpitations of five hours duration.

One month previously he suffered weakness of the right arm and problems with his speech which resolved within four hours. He was taking no medication.

On examination, he was stable with a pulse of 135 beats per minute which was confirmed to be atrial fibrillation on ECG. He had a blood pressure of 112/80 mmHg and appeared clinically euthyroid.

Within one hour he reverted to sinus rhythm spontaneously.

Echocardiogram was normal but a 24 hour ECG revealed three episodes of atrial fibrillation each lasting around ten minutes.

Which one of the following is the most appropriate initial treatment for this patient?

- 1- Amiodarone
- 2- Aspirin
- 3- Atenolol
- 4- Digoxin
- 5- Warfarin

Answer & Comments

Answer: 5- Warfarin

The most appropriate initial therapy for this patient who has a high risk of thrombo-embolic stroke is anticoagulation with

warfarin maintaining an international normalised ratio (INR) between 2-3.

This should be the initial priority as he has already had one episode of transient ischaemic attack (TIA).

The maintenance of sinus rhythm would be the next step and amiodarone or sotalol are options.



[Q: 1834] OnExamination 2012 - Cardiology

A 63-year-old woman is admitted to hospital with a three day history of diarrhoea and vomiting. Her family tell you she has been virtually unable to eat or drink, but has managed to take her tablets during that time.

Her past medical history includes essential hypertension and ischaemic heart disease. Her current medication consists aspirin 75 mg daily, ramipril 5 mg daily, simvastatin 40 mg daily.

Her admission bloods demonstrate:

Sodium 144 mmol/l 137 - 144

Potassium 4.1 mmol/l 3.5 - 4.9

Urea 10.8 mmol/l 2.5 - 7.5

Creatinine 195 µmol/l 60 - 110

Which of the following is most appropriate?

- 1- Double dose of ramipril
- 2- Give clopidogrel 300 mg stat
- 3- Give loperamide
- 4- Withhold aspirin
- 5- Withhold ramipril

Answer & Comments

Answer: 5- Withhold ramipril

The history is entirely consistent with gastroenteritis, and as a result of the protracted vomiting the patient has become dehydrated. In this context an ACE inhibitor (ramipril) is dangerous and should be stopped.

Within the kidneys the afferent and efferent arterioles take blood to (afferent) and from (efferent) the glomerulus.

ACE inhibitors work by decreasing the tone of the efferent arterioles, which in a euvolaemic patient can protect the kidney in hypertension, diabetes and other insults. However in a hypovolaemic patient (such as this patient) this can lead to catastrophic impairment of renal function.



[Q: 1835] OnExamination 2012 - Cardiology

A 52-year-old man presents to the clinic having problems controlling his blood pressure, despite taking three anti-hypertensive agents, ramipril 10 mg, indapamide 2.5 mg, and amlodipine 5 mg.

Over the past few weeks he has been monitoring his BP at home and it is rarely below 155/90 mmHg.

On examination in the clinic his BP is 160/95 mmHg, his pulse is 85 and regular. He has a left carotid bruit. Respiratory and abdominal examinations are unremarkable.

Investigations show:

Haemoglobin 12.0 g/dl (13.5-17.7)

White cells $6.3 \times 10^9/L$ (4-11)

Platelets $200 \times 10^9/L$ (150-400)

Sodium 140 mmol/l (135-146)

Potassium 4.8 mmol/l (3.5-5)

Creatinine 182 $\mu\text{mol/l}$ (79-118)

Renal ultrasound scan showed significant size discrepancy, with the left kidney 2 cm smaller than the right.

Which of the following is the most appropriate next investigation?

- 1- Contrast CT
- 2- Duplex ultrasound scanning
- 3- IVU
- 4- Magnetic resonance angiogram

5- Traditional angiography

Answer & Comments

Answer: 2- Duplex ultrasound scanning

Duplex ultrasound scanning is both sensitive and specific for detection of renal artery stenosis but is only effective in the hands of a highly skilled technician.

Alternatives include contrast CT or MRA using gadolinium.

There is concern here, albeit low, that he may develop contrast nephropathy, and some commentators have raised the prospect of increased risk of renal fibrotic disease in response to gadolinium scanning. As such, the next investigation would be duplex scanning, with progression to traditional angiography if required, with (of course) adequate fluid loading to reduce the risk of contrast nephropathy.



[Q: 1836] OnExamination 2012 - Cardiology

A 16-year-old male presents with acute severe asthma.

On examination his peripheral pulse volume fell during inspiration.

Which one of the following is the most likely explanation for this clinical sign?

- 1- A falling heart rate on inspiration
- 2- Myocardial depression due to hypoxia
- 3- Peripheral vasodilatation
- 4- Reduced left atrial filling pressure on inspiration
- 5- The cardiac effect of high dose beta agonist bronchodilator drugs

Answer & Comments

Answer: 4- Reduced left atrial filling pressure on inspiration

This patient is demonstrating pulsus paradoxus.

The right heart responds directly to changes in intrathoracic pressure, while the filling of the left heart depends on the pulmonary vascular volume.

At high respiratory rates, with severe air flow limitation (for example, acute asthma) there is an increased and sudden negative intrathoracic pressure on inspiration and this will enhance the normal fall in blood pressure.



[Q: 1837] OnExamination 2012 - Cardiology

A 72-year-old man with a history of oesophageal carcinoma is recovering on the surgical ward after oesophagostomy.

You are asked to see him because he has developed worsening central chest pain, looks pale and sweaty and has dropped his blood pressure to 100/55 mmHg with a pulse of 92. He has bibasal crackles on auscultation of the chest.

Investigations show

Haemoglobin 10.8 g/dl(13.5-18)

White cell count $9.0 \times 10^9/L$ (4-10)

Platelets $180 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (134-143)

Potassium 4.4 mmol/l (3.5-5)

Creatinine 145 $\mu\text{mol/l}$ (60-120)

ECG Anterior ST elevation consistent with acute MI

Which of the following is the most appropriate management?

- 1- Angioplasty
- 2- Aspirin, clopidogrel and low molecular weight heparin
- 3- Aspirin, clopidogrel, low molecular weight heparin and abciximab
- 4- CABG

5- Thrombolysis

Answer & Comments

Answer: 1- Angioplasty

Thrombolysis is contraindicated in this gentleman due to his recent surgery, and anti-platelet therapy with or without IIb3a inhibitor will provide limited advantage in a man with a STEMI, while simultaneously increasing his risk of significant bleeding so soon after surgery.

As such, there is only one logical management plan for him: to consider angioplasty.

Evidence suggests angioplasty is superior to thrombolysis in the general population, and as such, this man should be managed aggressively and transferred to the catheter lab as soon as is practicable.



[Q: 1838] OnExamination 2012 - Cardiology

Which of the following mechanisms best explains the action of OMACOR (omega-3-acid ethyl esters)?

- 1- Activation of PPAR-alpha
- 2- Bile acid sequestration
- 3- Decreases hepatic cholesterol synthesis
- 4- Increases peroxisomal beta-oxidation of fatty acids
- 5- Inhibits cholesterol absorption

Answer & Comments

Answer: 4- Increases peroxisomal beta-oxidation of fatty acids

OMACOR reduces triglycerides by different, independent effects in the liver.

The synthesis of triglycerides is inhibited through reduced production of triglycerides in the liver, as eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) are poor

substrates for the enzymes responsible for triglyceride synthesis.

EPA and DHA also inhibit esterification of other fatty acids.

OMACOR increases peroxisomal beta-oxidation of fatty acids in the liver.



[Q: 1839] OnExamination 2012 - Cardiology

A 60-year-old man has left ventricular failure and clinically he is classified as NYHA Class III.

He takes furosemide, aspirin and ramipril.

The addition of which one of the following betablockers would be expected further to improve his prognosis?

- 1- Acebutolol
- 2- Bisoprolol
- 3- Esmolol
- 4- Propranolol
- 5- Sotalol

Answer & Comments

Answer: 2- Bisoprolol

Bisoprolol is a highly selective beta1-adrenoceptor antagonist.

Administration of bisoprolol to patients with chronic heart failure is associated with increases in left ventricular function and reductions in heart rate; increases in heart rate variability are also seen.

Two major randomised, double-blind, placebo-controlled, multicentre trials have examined the clinical efficacy of bisoprolol in combination with ACE inhibitors and diuretics in patients with stable chronic heart failure (New York Heart Association class III or IV).

Reference:

Drugs. 2002;62(18):2677-96



[Q: 1840] OnExamination 2012 - Cardiology

A 48-year-old man presents with acute coronary syndrome.

On examination he has palmar crease xanthoma.

Which of the following is the most likely diagnosis of his lipid abnormalities?

- 1- Familial combined hyperlipidaemia
- 2- Familial hypercholesterolaemia
- 3- Familial hypertriglyceridaemia
- 4- Lipoprotein lipase deficiency
- 5- Remnant hyperlipidaemia

Answer & Comments

Answer: 5- Remnant hyperlipidaemia

Remnant hyperlipidaemia (type III hyperlipidaemia) is associated with:

Hypercholesterolaemia, typically 8-12 mmol/l

Hypertriglyceridaemia, typically 5-20 mmol/l

Normal ApoB concentration

Palmar xanthomata - orange discoloration of skin creases

Tuberoeruptive xanthomata - elbows and knees

Early onset of cardiovascular disease

Early onset of peripheral vascular disease.

Remnant hyperlipidaemia is due to abnormal function of the ApoE receptor, which is normally required for clearance of chylomicron remnants and IDL from the circulation.

The receptor defect causes levels of chylomicron remnants and IDL to be higher than normal in the blood stream. The receptor defect is an autosomal recessive mutation or polymorphism.

The genotype of the homozygous condition is apo E-2/E-2 and occurs with a frequency of 1:100.



[Q: 1841] OnExamination 2012 - Cardiology

A 62-year-old male who is being treated for stable angina presents with muscle aches and pains. He has been taking simvastatin 40 mg daily, atenolol 50 mg daily together with aspirin 75 mg daily for approximately two years.

Recently he was admitted for an episode of acute coronary syndrome and a number of other therapies were added. You suspect a statin-related myopathy and a CPK concentration is 820 iu/l (50-200).

Which of the following is most likely to be responsible for the precipitation of his statin-related myopathy?

- 1- Bisoprolol
- 2- Clopidogrel
- 3- Diltiazem
- 4- Omega-3 fatty acids
- 5- Spironolactone

Answer & Comments

Answer: 3- Diltiazem

Statin-associated myopathy occurs in up to 5% of those treated with statins and may be exacerbated by the co-prescription of other drugs such as calcium channel blockers, macrolide antibiotics, fibrates, amiodarone and grapefruit juice.

Whilst patients may tolerate a statin extremely well, a myopathy or rhabdomyolysis can quite easily be precipitated by the addition of these agents.



[Q: 1842] OnExamination 2012 - Cardiology

A 72-year-old man with type 2 diabetes mellitus presented following the sudden onset of palpitations.

An ECG revealed rapid atrial fibrillation. He was commenced on amiodarone but the atrial fibrillation persisted.

Which of the following has been shown to be of greatest benefit in reducing his future risk of vascular events?

- 1- Anticoagulation
- 2- Aspirin
- 3- Continuation of amiodarone
- 4- DC cardioversion
- 5- Digoxin

Answer & Comments

Answer: 1- Anticoagulation

Both sustained and paroxysmal atrial fibrillation (AF) are associated with a relatively high incidence of thromboembolism and stroke.

Clinical trials have demonstrated that warfarin reduces the risk of stroke in patients with AF. This benefit outweighs the risk of bleeding.



[Q: 1843] OnExamination 2012 - Cardiology

A 43-year-old man presents to the Emergency department with a three hour history of chest pain. He has a history of 'angina' diagnosed by his GP. He is awaiting objective assessment to confirm this. His GP started aspirin and gave him a GTN spray with instructions how to use it.

The pain came on after walking up a hill but has not gone away. He took three puffs of GTN but this had no significant effect. He looks sweaty and unwell. You review his 12 lead ECG but it looks normal to you. You think

this patient has an acute coronary syndrome (ACS) and decide to admit for assessment.

Which of the features listed below is a good indicator of presence of acute coronary syndrome?

- 1- Associated feeling of impending doom
- 2- Associated nausea and sweating
- 3- Good response to GTN
- 4- Pain in chest lasting at least one hour
- 5- Pain which varies with patient's position

Answer & Comments

Answer: 2- Associated nausea and sweating

Diagnosis of ACS is based on clinical history and/or presence of ischaemic ECG changes with or without troponin elevation. Each of these should not be relied upon in isolation but interpreted in the context of the others.

In March 2010 NICE produced clinical guidance on the assessment of chest pain (CG 95). It listed clinical factors which are good indicators of ACS. These included typical pain lasting at least 15 minutes and associated nausea and sweating.

The guidance specifically mentions that response to GTN should not be used as GTN has a strong placebo.



[Q: 1844] OnExamination 2012 - Cardiology

A 75-year-old lady has been referred to you in the cardiology clinic with a four month history of breathlessness on exertion. She has a 20 year history of hypertension and type II diabetes, controlled with insulin.

On questioning she has noted gradually progressive breathlessness with mild ankle oedema. She has noted worsening symptoms at night.

On examination her venous pressure is not elevated but there are slight bibasal crackles.

Her heart sounds are normal and there is mild oedema. You arrange further tests and follow up.

Regarding the heart failure, which of these clinical signs has the greatest sensitivity in detecting heart failure?

- 1- Oedema
- 2- Pulmonary crackles
- 3- Raised jugular venous pressure
- 4- Tachycardia
- 5- Third heart sound

Answer & Comments

Answer: 5- Third heart sound

The clinical syndrome of heart failure is not a diagnosis; a cause for cardiac dysfunction must be found.

Symptoms and signs of heart failure tend to lack sensitivity and specificity; heart failure will be misdiagnosed about half of the time when based solely on clinical features.

The sensitivity of a third heart sound has been estimated at approximately 30%. The sensitivities of answers A, B, C and D are approximately 10%, 13%, 10%, 7% respectively.

Therefore the correct answer is E.



[Q: 1845] OnExamination 2012 - Cardiology

An 82-year-old former soldier with no prior medical history of note was admitted following appendicitis treated with laparoscopic appendicectomy a week previously.

At laparotomy the appendix was inflamed though not perforated. The operative notes describe an uncomplicated procedure with minimal blood loss. There were no immediate post-operative issues of note, with stable blood count and biochemistry.

The bowels opened at day three, and the patient was back to his usual diet and level of independent mobility by day six. He has lived alone since being widowed over twenty years ago, is fully mobile and self-caring, and feels able to return home without any home help.

He is referred to the medical team prior to discharge to address a consistently high systolic blood pressure, ranging around 160 - 170 mmHg, over repeated readings during the course of the admission, with no diurnal variation. Similar readings are obtained from all four limbs, in lying and standing positions.

A review of his history indicates that the patient takes over the counter analgesia as required, but has never required medical care. He is a former smoker, but gave up many years ago. He has a good diet, and walks his dog two miles a day.

On clinical examination the patient is euvolaemic with an undisplaced apex, normal heart sounds and no bruits. Undilated fundoscopy is normal. Urine dipstick demonstrated a trace of ketones but nil else. The cardiac axis is normal on ECG. Biochemistry, including renal function, fasting glucose and lipid profile, is normal. BMI is calculated at 22 kg/m².

What is the best strategy to manage this patient's hypertension?

- 1- 24 hour urine collection to look for proteinuria
- 2- Aggressively modify lifestyle factors
- 3- Ambulatory blood pressure monitor
- 4- Avoid antihypertensives in view of the risk of falls
- 5- Offer antihypertensive therapy

Answer & Comments

Answer: 5- Offer antihypertensive therapy

The hypertension in the very elderly trial [HYVET] clarified uncertainty surrounding the control of blood pressure in elderly patients,

and whether its benefits outweighed the risks of side effects in an aged population.

It compared diuretics, plus or minus ACE inhibitors, against placebo in patients above 80 years of age. This yielded not only a decrease in cardiovascular events, but also appreciably improved all cause mortality. The trial set a target blood pressure of 150 / 80, and it is unclear at this stage whether aiming for a lower target will reap further benefit.

It is also uncertain which classes of drugs are best, and in which order. Thiazides, ACE-inhibitors and calcium channel blockers have been advocated in a stepwise fashion.

In this case, the trace of ketones on urine dipstick is of no consequence in a patient with established diet and bowel habit who is euvolaemic and has recently had abdominal surgery. In the absence of a positive urine dipstick there is no need to pursue the possibility of proteinuria.

This patient has little in the way of lifestyle factors to modify, being a non-smoker with frequent exercise, good diet and normal BMI.

Regular blood pressure monitoring has in effect been carried out during the week of admission, with a consistently elevated blood pressure and an ambulatory blood pressure monitor would add little. Note that in this population it is important to measure blood pressure in all four limbs, and in lying / standing positions, in view of the risks of diffuse arterial disease and orthostatic hypotension respectively.

Denying this patient antihypertensives in fear of falls is inappropriate in the context of his mobility and independence.

Reference:

Beckett NS et al, NEJM 2008; 358: 1887 - 98:
Hypertension in the very elderly trial [HYVET]
Zeglin MA et al. Cardiol J 2009; 16: 379 - 85:
Comprehensive overview of evidence to date.



[Q: 1846] OnExamination 2012 - Cardiology

A 58-year-old man with a history of schizophrenia on thioridazine is found to have episodes of torsades de pointes ventricular tachycardia (VT).

His blood pressure is 110/70 mmHg.

Which of the following is the most appropriate management?

- 1- IV betablocker
- 2- IV lidocaine
- 3- IV magnesium
- 4- Overdrive pacing
- 5- Synchronised DC cardioversion

Answer & Comments

Answer: 3- IV magnesium

Thioridazine, an antipsychotic, and many other drugs can prolong the QT interval and increase the risk of torsade de pointes VT.

Self-limiting bursts of torsade may be seen on an ECG and prompt urgent treatment.



[Q: 1847] OnExamination 2012 - Cardiology

A 38-year-old teacher attends the hypertension clinic, having been referred via her general practitioner following a sequence of elevated systolic blood pressure readings.

Though she is worried about the long term consequences of hypertension she has never trusted the medical profession, is worried about the possible side effects of medication, and wishes to control her blood pressure through alternative therapies.

Which of the following interventions is part of currently advocated measures to reduce blood pressure?

- 1- Acupuncture
- 2- Ginseng

- 3- High fibre diet
- 4- Meditation
- 5- Sodium supplements

Answer & Comments

Answer: 4- Meditation

The Dietary Approaches to Stop Hypertension [DASH] diet demonstrated a convincing and dynamic link between dietary intake and systemic blood pressure, with rapid improvement in blood pressure on a fruit and vegetable-based diet with low dairy and fat consumption. However this is yet to translate into novel lifestyle modifications.

Though a vast body of work is available on complementary therapies for hypertension, of the above only relaxation therapies have been conclusively shown to reduce blood pressure as part of a preventative effort to improve a patient's risk profile.

Sodium supplements are the opposite of what is recommended, with dietary salt restriction being a key and effective part of advice.

Calcium, magnesium and potassium supplements have some tenuous supporting data against the background of other contradictory studies, and are not recommended in national guidelines.

Ginseng has anecdotally been associated with hypertension. Sadly long term compliance with drastic changes in a lifelong diet is poor.

Other conventional and well-known lifestyle measures against hypertension include increased exercise, weight loss, moderation of alcohol intake and smoking cessation. These aims should be reiterated when consulting any patient with new or indeed longstanding hypertension.

Reference:

NICE Clinical Guideline 34: Hypertension. National Institute for Health and Clinical Excellence, London (2006).

Savica et al. Annu Rev Nutr 2010; 30: 365 - 401: review of dietary methods of controlling hypertension



[Q: 1848] OnExamination 2012 - Cardiology

A 60-year-old woman with ischaemic heart disease is seen for review.

She reports that she has developed symmetrical muscle aches and pains and you attribute this to a myalgia associated with simvastatin. Her creatinine kinase is within the normal range.

However, her dyslipidaemia management is still sub-optimal and you wish to add in a further agent.

Total cholesterol 5.5 mmol/l (<5.2)

LDL cholesterol 3.8 mmol/l (<3.36)

HDL cholesterol 1.3 mmol/l (>1.55)

Triglycerides 1.4 mmol/l (0.45-1.69)

You plan to continue the statin treatment.

Which of the following agents would be the most appropriate additional therapy for this patient?

- 1- Cholestyramine
- 2- Ezetimibe
- 3- Gemfibrozil
- 4- Nicotinic acid
- 5- Omega-3 fatty acids

Answer & Comments

Answer: 2- Ezetimibe

This patient presents with a probable statin-induced myalgia which often improves with time. Sometimes stopping therapy briefly or re-introducing a different statin may resolve the myalgia.

Statin-induced myositis is relatively uncommon occurring in approximately 0.1-0.2%. The risk of myositis and the potentially

fatal rhabdomyolysis is, in prone subjects, increased with gemfibrozil in combination with a statin and as such should be avoided.

Additional agents could include omega-3 fatty acids and ezetimibe.

Nicotinic acid is less used due to problems with flushing though can be useful particularly in hypertriglyceridaemia.

Cholestyramine can also be used.

In this case it is the low density lipoprotein (LDL) cholesterol that needs to be targeted and ezetimibe would be the most appropriate choice.



[Q: 1849] OnExamination 2012 - Cardiology

Cyanosis is a typical feature of which of the following conditions?

- 1- Atrial septal defect (ASD)
- 2- Mitral atresia.
- 3- Patent ductus arteriosus.(PDA)
- 4- Total anomalous pulmonary venous drainage.
- 5- Ventricular septal defect.(VSD)

Answer & Comments

Answer: 4- Total anomalous pulmonary venous drainage.

Total anomalous pulmonary venous connection (TAPVC) is associated with cyanosis in the newborn.

TAPVC consists of an abnormality of blood flow in which all four pulmonary veins drain into systemic veins or the right atrium with or without pulmonary venous obstruction.

Systemic and pulmonary venous blood mix in the right atrium.

PDA, ASD and VSD are left to right shunts.

Tricuspid atresia is typically associated with cyanosis rather than mitral.



[Q: 1850] OnExamination 2012 - Cardiology

In a normal heart, the oxygen saturation of a sample of blood taken from a catheter in the pulmonary capillary wedge position should be equal to a sample from which of the following?

- 1- Coronary sinus
- 2- Femoral artery
- 3- Pulmonary artery
- 4- Right atrium
- 5- Right ventricle

Answer & Comments

Answer: 2- Femoral artery

Pulmonary capillary wedge normal values reflect pressures and saturations of the left side of the heart and therefore reflect the arterial system.

Consequently the saturations of blood taken from the wedged source reflect blood in the pulmonary vein (that is, oxygenated blood) and hence high saturations similar to that seen in the femoral artery.



[Q: 1851] OnExamination 2012 - Cardiology

Whilst attending the cardiology clinic, the staff nurse measures the blood pressure of a 61-year-old man, and finds that it is 183/100 mmHg sitting and 190/105 mmHg standing.

He has a heart rate of 81/minute, with an irregularly irregular rhythm.

On auscultation of the heart, there are no murmurs, but he has bibasilar crackles on chest examination.

Which of the following pathological findings is most likely to be present?

- 1- Cor pulmonale
- 2- Left atrial myxoma
- 3- Left ventricular hypertrophy (LVH)
- 4- Mitral regurgitation
- 5- Occlusive coronary atherosclerosis

Answer & Comments

Answer: 3- Left ventricular hypertrophy (LVH)

This gentleman is likely to have a hypertensive cardiomyopathy with a left ventricle hypertrophy.

The LVH is secondary to increased afterload, as a result of chronic hypertension. The atrial fibrillation suggested by an irregularly irregular pulse, is an indicator of diastolic dysfunction and poor ventricular filling.

This in turn indicates the pulmonary congestion, as evidenced by the bibasal crackles.

There is no murmur or plop to suggest atrial myxoma.



[Q: 1852] OnExamination 2012 - Cardiology

A 75-year-old lady presents with sudden breathlessness and palpitations.

On examination, she was observed to have an irregular heart beat with rate of 140 bpm, BP 85/40 mmHg and normal heart sounds. On auscultation of the chest, fine basal crepitations are heard.

An ECG confirms atrial fibrillation (AF) and an old inferior myocardial infarction. She is anticoagulated with heparin and given diuretics. Her heart rate remains rapid.

What is the most appropriate management of the lady's AF?

- 1- DCCV
- 2- IV amiodarone
- 3- IV beta-blocker

4- IV digoxin

5- Oral quinidine therapy

Answer & Comments

Answer: 1- DCCV

The key to this question is that the patient has clinical signs of pulmonary oedema with fast AF and hypotension.

In this age group AF is poorly tolerated and often leads to pulmonary oedema even in the presence of a relatively normal left ventricle (LV).

NICE have published guidance on the treatment of AF.

The primary aim here should be rate control which is best achieved with direct current cardioversion (DCCV) in this situation.

Digoxin even when used intravenously is suggested to have too slow an onset of action to merit its use.

B-blockers can also be used but due to the fact that they are negatively inotropic may complicate the acute pulmonary oedema.

Emergency DCCV is required as there is haemodynamic compromise (low BP).

Reference:

M Bilal Iqbal, Anil K Taneja, Gregory Y H Lip, and Marcus Flather. *Recent developments in atrial fibrillation*. BMJ, Jan 2005;330:238-243



[Q: 1853] OnExamination 2012 - Cardiology

Which of the following is true regarding the action of clopidogrel?

- 1- It inhibits cyclo-oxygenase
- 2- It is a glycoprotein IIb/IIIa inhibitor
- 3- It is a hydroxymethyl co-enzyme A inhibitor
- 4- It is a selective factor Xa inhibitor
- 5- It is an ADP receptor antagonist

Answer & Comments

Answer: 5- It is an ADP receptor antagonist

Clopidogrel prevents platelet aggregation through antagonism of the adenosine diphosphate (ADP) receptor.

It has been shown to reduce mortality from stroke and ischaemic heart disease (IHD) in primary prevention studies.



[Q: 1854] OnExamination 2012 - Cardiology

A 34-year-old patient with longstanding primary hypertension presents in her first pregnancy. ECG, urine dipstick and fundoscopy are normal. Her current blood pressure is 140 / 95.

What is the maximal acceptable blood pressure?

- 1- 120 / 70
- 2- 130 / 70
- 3- 140 / 80
- 4- 150 / 90
- 5- 150 / 100

Answer & Comments

Answer: 5- 150 / 100

The target blood pressure in patients with pre-existing hypertension is under 150 / 100, or 140 / 90 in the presence of end organ failure.

In patients with longstanding hypertension aggressive blood pressure control may compromise placental function, so diastolic blood pressure should be preserved above 80 mmHg.

Any increase in blood pressure above baseline should prompt a search for new pre-eclampsia, testing full blood count, renal and liver function, urinary protein / creatinine ratio, and observing blood pressure closely.

Reference:

NICE Clinical Guideline 107: Hypertension in pregnancy. National Institute for Health and Clinical Excellence, London (2010).



[Q: 1855] OnExamination 2012 - Cardiology

A 43-year-old woman presents to the emergency department with diarrhoea and vomiting over the past 48 hours. She has a history of hypertension for which she takes indapamide 1.5 mg daily, but no other past medical history of note.

On examination she looks unwell and has a BP of 122/71 mmHg and a pulse of 79. Her abdomen is soft but there is tenderness consistent with her gastroenteritis.

Investigations show

Haemoglobin 14.8 g/dl(11.5-16)

White cell count $9.8 \times 10^9/L$ (4-10)

Platelets $174 \times 10^9/L$ (150-400)

Sodium 140 mmol/l (134-143)

Potassium 2.9 mmol/l (3.5-5)

Creatinine 139 $\mu\text{mol/l}$ (60-120)

Which of the following is most likely to be found on her ECG?

- 1- Atrial fibrillation
- 2- J waves
- 3- Peaked T waves
- 4- Shortening of the QT interval
- 5- ST depression

Answer & Comments

Answer: 5- ST depression

When potassium falls below 3 mmol/l, the ECG often demonstrates:

- Flattening of the T waves
- ST depression
- QT prolongation
- Prominent U waves.

Patients are at increased risk of ventricular ectopics, torsades de pointes and ventricular tachycardia.

Other constitutional symptoms associated with hypokalaemia of less than 3.0 mmol/l include:

- Tiredness
- General weakness
- Muscle pain
- Constipation.



[Q: 1856] OnExamination 2012 - Cardiology

A 40-year-old male attends for a consultation after discovering that his brother has been diagnosed with a familial hypertrophic obstructive cardiomyopathy (HOCM).

Which screening method should he be offered?

- 1- Coronary angiogram
- 2- Exercise ECG
- 3- Genetic testing
- 4- Transoesophageal echocardiogram
- 5- Transthoracic echocardiogram

Answer & Comments

Answer: 5- Transthoracic echocardiogram

Current guidelines suggest that a resting ECG and TTE (transthoracic ECHO) are the most effective screening strategy for relatives of patients with HOCM.

Genetic testing is not recommended as a first line screening tool, given varying rates of penetrance.



[Q: 1857] OnExamination 2012 - Cardiology

On physical examination of a 42-year-old man you find a 'jerky' pulse.

Which of the following conditions is most associated with a 'jerky' pulse?

- 1- Aortic stenosis
- 2- Cardiac tamponade
- 3- Hypertrophic obstructive cardiomyopathy
- 4- 'Mixed' aortic valve disease
- 5- Severe left ventricular failure

Answer & Comments

Answer: 3- Hypertrophic obstructive cardiomyopathy

Hypertrophic obstructive cardiomyopathy (HOCM) is typically associated with a jerky pulse although it may present with entirely normal clinical findings.



[Q: 1858] OnExamination 2012 - Cardiology

A 67-year-old man with insulin-dependent diabetes with a broad complex pulseless tachyarrhythmia (with a protected airway) has just been defibrillated for the third time without return of cardiac output -CPR is immediately resumed and adrenaline administered.

Which of the following is the next step in the management of the arrest?

- 1- Adrenaline 1 mg
- 2- Amiodarone 300 mg
- 3- DC shock
- 4- Lidocaine 100 mg
- 5- Removal of oxygen and then DC shock

Answer & Comments

Answer: 2- Amiodarone 300 mg

The next step is amiodarone 300 mg intravenously (i.e. given after the third shock), if amiodarone is not available lidocaine is a suitable alternative.



[Q: 1859] OnExamination 2012 - Cardiology

A 59-year-old male has been discharged from hospital following an uncomplicated admission with myocardial infarction (MI) and treated with stenting. His therapy at discharge included aspirin 75 mg daily, clopidogrel 75mg daily, ramipril 10 mg daily, atenolol 50mg daily and simvastatin 40 mg daily.

On subsequent review, one month after discharge, he is well and unaware of any chest pain. His blood pressure is 134/78 mmHg and he has a resting heart rate of 66 bpm. There are no abnormalities on auscultation of the heart or chest.

Investigations reveal:

Cholesterol 4.6 mmol/l (<5.2)

Triglyceride 0.8 mmol/l (0.45-1.69)

Glucose 5.6 mmol/l (3.0-6.0)

U&E Normal

Which of the following therapies added to his current treatment regime would be expected to reduce mortality still further?

- 1- Amlodipine
- 2- Ezetimibe
- 3- Furosemide
- 4- Omega-3 fatty acids
- 5- Vitamin E

Answer & Comments

Answer: 4- Omega-3 fatty acids

Of the agents suggested, omega-3 fatty acids (in essence fish oils) have been demonstrated in the GISSI-prevenzione study to reduce mortality in this particular group of patients with coronary artery disease on standard treatment by a further approximate 20% for all cause mortality and 40% reduction in sudden deaths versus controls.

Vitamin E therapy was associated with no significant differences.

It appears that omega-3 fish oils may have a benefit beside improving lipid profile with increases in high density lipoprotein (HDL) and reductions in triglyceride, as it has been suggested that they may confer some anti-arrhythmic effect.

Short-acting calcium antagonists early after MI possibly increase mortality, and certainly have no beneficial effect.

Similarly, furosemide has no data to indicate improved outcome.

Ezetimibe, which inhibits cholesterol reabsorption has no data to indicate a survival advantage.



[Q: 1860] OnExamination 2012 - Cardiology

A 29-year-old male is admitted with a one hour history of severe central chest pain associated with vomiting.

It transpires that he used cocaine three hours ago. His blood pressure is 142/74 mmHg and he has a pulse of 110 beats per minute regular. His ECG reveals 3 mm ST segment elevation in leads V2-5.

Which of the following is the most appropriate treatment for this patient?

- 1- Abciximab
- 2- Angiography +/- PTCA
- 3- Isoket (isosorbide dinitrate) infusion
- 4- Low molecular weight heparin
- 5- Tissue plasminogen activator (rtPA)

Answer & Comments

Answer: 3- Isoket (isosorbide dinitrate) infusion

Cocaine is a drug of widespread abuse and remains one of the commonest causes of acute myocardial infarction (MI) in men below 35 years of age.

The aetiology of cocaine-induced MI is thought to be related to coronary artery spasm as many patients do not have overt coronary artery disease. This vasoconstriction is thought to be more accentuated in those with pre-existing coronary artery disease or those who smoke. It is probably caused by stimulation of the β -adrenergic receptors in smooth muscle cells. In addition, cocaine increases endothelin-1 (a vasoconstrictor) and decreases nitric oxide (vasodilator).

Consequently guidelines suggest the use of nitrates in the first instance coupled with calcium antagonists. Intravenous benzodiazepines are also effective in resolving chest pain and improving cardiac performance. If there is no improvement in the clinical condition, then angiography should be considered. Fibrinolytics are generally avoided.

Reference:

ACC Guidelines 2007, J Am Coll Cardiol 2007;50:1-157

Management of Cocaine-Associated Chest Pain and Myocardial Infarction. A Scientific Statement From the American Heart Association Acute Cardiac Care Committee of the Council on Clinical Cardiology. McCord J et al. Circulation 2008;117:1897-1907.



[Q: 1861] OnExamination 2012 - Cardiology

A 74-year-old man presented with intermittent chest pain at rest.

Which one of the following would most strongly suggest that the pain was due to myocardial ischaemia?

- 1- Associated dyspnoea
- 2- Coexistent claudication
- 3- Past history of cigarette smoking
- 4- Radiation of pain to the jaw
- 5- Relief of pain by sublingual nitrate

Answer & Comments

Answer: 4- Radiation of pain to the jaw

Nitrates may relieve the pain of oesophageal spasm, as well as that of myocardial ischaemia.

Associated dyspnoea may be due to anxiety.

Coexistent claudication suggests the presence of peripheral vascular disease.

A past history of cigarette smoking is a risk factor for the development of cardiovascular disease.

However, the most specific feature of the given options which suggests that the pain is myocardial ischaemia, is the radiation to the jaw, which is relatively specific for pain of myocardial ischaemia.



[Q: 1862] OnExamination 2012 - Cardiology

A 40-year-old female with mitral stenosis consults for advice regarding operative procedures.

In which of the following circumstances would antibiotic prophylaxis of infective endocarditis be required?

- 1- Caesarian section
- 2- Cardiac catheterisation
- 3- Dental scaling
- 4- No indications for prophylaxis
- 5- Termination of pregnancy

Answer & Comments

Answer: 4- No indications for prophylaxis

Antibiotic prophylaxis against endocarditis is now not recommended in common cardiac valve abnormalities.

Prophylaxis is only recommended in those patients who are at highest risk of adverse

outcomes on the development of endocarditis. These patient groups include:

Prosthetic cardiac valve or prosthetic material used for cardiac valve repair

Previous endocarditis

Unrepaired cyanotic congenital heart disease including palliative shunts and conduits

Completely repaired congenital heart defect with prosthetic material or device, whether placed by surgery or by catheter intervention, during the first six months after the procedure

Repaired congenital heart disease with residual defects (persisting leaks or abnormal flow) at the site or adjacent to the site of a prosthetic patch or prosthetic device (which inhibit endothelialisation)

Cardiac transplantation recipients who develop cardiac valve abnormalities.



[Q: 1863] OnExamination 2012 - Cardiology

A 30-year-old man presents with a history of transient loss of consciousness and palpitations. His ECG shows ventricular tachycardia (VT).

Which of the following treatments should be avoided?

- 1- Adenosine
- 2- Amiodarone
- 3- DC cardioversion
- 4- Flecainide
- 5- Verapamil

Answer & Comments

Answer: 5- Verapamil

If there were 'killer' questions (questions that if a candidate got wrong they would certainly fail the exam) in the MRCP examination then this would be one of them.

Verapamil should be avoided in cases of VT because it can cause a catastrophic fall in blood pressure.

Adenosine is useful diagnostically when the diagnosis of regular wide complex tachycardia is in doubt.

Amiodarone is a useful antiarrhythmic agent though its use acutely is limited by its irritant nature on veins.

DC cardioversion is probably the treatment of choice in this case.

Flecainide is a good antiarrhythmic and would be indicated in patients without left ventricular (LV) failure (it is associated with an increased risk of death in such cases).

Flecainide is widely used for atrial fibrillation.



[Q: 1864] OnExamination 2012 - Cardiology

A 73-year-old woman with atrial fibrillation due to ischaemic heart disease is well controlled with digoxin and amiodarone. She presents with a two month history of weight loss and palpitations.

Examination reveals an irregular pulse of 110 bpm.

Investigations show:

Serum TSH < 0.05 mU/L (0.2-5.5)

Serum total T4 140 nmol/L (58-174)

Which of the following would be the most useful investigation in establishing the diagnosis of thyrotoxicosis?

- 1- Antithyroglobulin antibody titre.
- 2- Antithyroid peroxidase antibody titre.
- 3- Serum free T4 concentration.
- 4- Serum reverse T3 concentration.

- 5- Serum total T3 concentration.

Answer & Comments

Answer: 3- Serum free T4 concentration.

Amiodarone may cause both hypo- and hyperthyroidism.

It also interferes in the peripheral conversion of T4 to T3.

This patient appears thyrotoxic and of the measures given free T4 is most appropriate.



[Q: 1865] OnExamination 2012 - Cardiology

A 64-year-old man is admitted with a right femoral neck fracture following a fall.

Also seen in the radiograph of the pelvis are several prominent calcified vessels.

What is the most appropriate next step in management of this finding?

- 1- Anticoagulate with heparin
- 2- Ignore it
- 3- Order a pulmonary ventilation-perfusion scan
- 4- Request a serum troponin test
- 5- Start the patient on a nitrate infusion

Answer & Comments

Answer: 2- Ignore it

This finding is typical for Monckeberg's calcific medial sclerosis, a benign condition involving muscular arteries of older persons.



[Q: 1866] OnExamination 2012 - Cardiology

A 52-year-old male presents with a three week history of fevers, deteriorating breathlessness and fatigue. Two years ago he underwent prosthetic valve replacement for a calcified bicuspid aortic valve.

On examination he has a temperature of 37.7°C and four nail-fold infarcts. Vegetations are demonstrated through transoesophageal echocardiography.

Which of the following is the most likely causative organism?

- 1- Candida spp.
- 2- Enterococcus
- 3- Staphylococcus aureus
- 4- Staphylococcus epidermidis
- 5- Streptococcus viridans

Answer & Comments

Answer: 5- Streptococcus viridans

Generally there are two identifiable modes of prosthetic valve endocarditis.

The first occurs in the first year after surgery affecting 0.7-3% of cases and is often due to Staphylococci.

Late endocarditis observed after two years post-surgery is found in 0.5-1% of cases and is typically due to Streptococci, typically group A haemolytic Streptococci, otherwise known as Strep. viridans.



[Q: 1867] OnExamination 2012 - Cardiology

A 58-year-old male has a 6 year history of hypertension for which he is receiving Candesartan, Amlodipine, Bendroflumethiazide and Aliskiren.

Which of the following best describes the mechanism of action of Aliskiren?

- 1- Aldosterone synthase inhibitor
- 2- Aldosterone receptor blocker
- 3- Bradykinin inhibitor
- 4- Direct renin inhibitor
- 5- Second generation angiotensin receptor antagonist

Answer & Comments

Answer: 4- Direct renin inhibitor

Aliskiren is a direct renin inhibitor and represents the first new class of drug available in over a decade for the treatment of hypertension. Renin has long been recognized as a possible site for blockade of the renin-angiotensin-aldosterone system (RAS) because it prevents conversion of angiotensinogen to angiotensin I and is a rate-limiting step in the RAS cascade.

Aliskiren binds to the active site of the renin molecule, blocking angiotensinogen cleavage, thus, preventing the formation of angiotensin I. Clinical studies have demonstrated at least equivalent blood pressure lowering efficacy compared with existing drugs with a favourable side effect profile.



[Q: 1868] OnExamination 2012 - Cardiology

What is troponin?

- 1- A component of thick filaments
- 2- A component of thin filaments
- 3- A myosin heavy chain
- 4- A myosin light chain
- 5- A substance produced by pulmonary vascular endothelium

Answer & Comments

Answer: 2- A component of thin filaments

Troponin is a component of thin filaments (along with actin and tropomyosin), and is the protein to which calcium binds to accomplish this regulation.

Troponin has three subunits, TnC, TnI, and TnT.

When calcium is bound to specific sites on TnC, the structure of the thin filament changes in such a manner that myosin (a molecular motor organised in muscle thick filaments)

attaches to thin filaments and produces force and/or movement.

In the absence of calcium, tropomyosin interferes with this action of myosin, and therefore muscles remain relaxed.



[Q: 1869] OnExamination 2012 - Cardiology

A 28-year-old man with a known history of congenital heart disease presents with a pansystolic murmur, large V waves in the JVP and pulsatile hepatomegaly.

Which of the following types of congenital heart disease is most likely to be associated with this presentation?

- 1- Atrial septal defect
- 2- Coarctation of the aorta
- 3- Ebstein's anomaly
- 4- Patent ductus arteriosus
- 5- Ventricular septal defect

Answer & Comments

Answer: 3- Ebstein's anomaly

The clinical features suggest tricuspid regurgitation. The correct answer is therefore Ebstein's anomaly.

The hemodynamic consequences of Ebstein anomaly result from displaced and malformed tricuspid leaflets and atrialization of the right ventricle. The leaflet anomaly leads to tricuspid regurgitation. The severity of regurgitation depends on the extent of leaflet displacement, ranging from mild regurgitation with minimally displaced tricuspid leaflets to severe regurgitation with extreme displacement.



[Q: 1870] OnExamination 2012 - Cardiology

A 74-year-old patient with a history of ischaemic heart disease presents with

shortness of breath. He is finding difficulty mobilising any further than around his home.

An ECHO demonstrates an ejection fraction of approximately 20%. He is on maximal drug therapy for heart failure, and is not thought to have an infective chest exacerbation. An ECG demonstrates sinus rhythm with a rate of 75/min and widened QRS complexes.

What is the most appropriate treatment option?

- 1- Addition of perhexiline therapy
- 2- Palliation as an in-patient with PRN morphine
- 3- Referral for biventricular pacing
- 4- Referral for cardiac transplant
- 5- Referral for implantable defibrillator

Answer & Comments

Answer: 3- Referral for biventricular pacing

This patient by definition has NYHA III heart failure (HF).

The CARE-HF study of heart failure patients has shown a 37% reduction in the primary end point of death and cardiovascular hospitalisation and a reduction of 36% in all-cause mortality compared with control. Control patients were treated with maximal medical therapy only, and follow-up was a mean of 29 months.

Examination of the COMPANION study demonstrates a 40% reduction in the risk of death or hospitalisation from HF, and a 36% reduction in death from any cause, after implantation of biventricular pacing wires with a defibrillator.

It may be that in the very near future we will be implanting biventricular pacing devices, with defibrillator actions, in those patients in the subject groups included in these studies.

The indications for implantation devices in these studies were low ejection fraction,

dyssynchrony on the ECG (widened QRS), and NYHA III/IV.

Perhexiline therapy may become standard therapy in this patient subgroup in the future, but as yet there is no mortality or morbidity evidence to support its widespread use.



[Q: 1871] OnExamination 2012 - Cardiology

A post-marketing surveillance study of a new heart failure therapy to the market was carried out on 10,000 subjects who had completed clinical trials.

Which one of the following most accurately reflects the information generated from such a study?

- 1- Adverse events profile
- 2- Comparative therapeutic efficacy
- 3- Cost benefit analysis
- 4- Cost effectiveness
- 5- Drug potency

Answer & Comments

Answer: 1- Adverse events profile

Post-marketing surveillance (PMS)/observational studies (phase IV studies) generally are designed to assess the potential side effects of new drugs but under everyday conditions and with a minimum of intervention.

In contrast to the randomised controlled trials, PMS typically includes patients from more extreme age groups and patients with comorbidity or other risk factors.

In order to cover a wide spectrum of patients and to observe rare events with sufficiently high probability, PMS enrolls a large number of patients, typically several thousands.

Comparative efficacy has already been undertaken in phase III studies (RCTs) but can also be undertaken as part of specific RCT

studies later in the drugs development and potency usually in phase I and II studies.



[Q: 1872] OnExamination 2012 - Cardiology

A 34-year-old man presented for an insurance medical. He was symptom free, but clinical examination suggested a small ventricular septal defect (VSD).

Which one of the following findings was most likely to have been present?

- 1- A short systolic murmur at the left sternal edge
- 2- A systolic murmur maximal at the apex
- 3- A systolic murmur with thrill at the left sternal edge (LSE)
- 4- An early diastolic murmur
- 5- Fixed splitting of the second heart sound

Answer & Comments

Answer: 3- A systolic murmur with thrill at the left sternal edge (LSE)

Typically, a small VSD generates a pansystolic murmur at the LSE accompanied by a thrill. The murmur may be heard at the apex but is usually loudest at the LSE.

Very small defects may generate an early/late systolic murmur.

Fixed splitting of the heart sounds usually accompanies atrial septal defects.



[Q: 1873] OnExamination 2012 - Cardiology

You are asked to see a patient in the intensive care unit who is short of breath and tachycardic to rule out a cardiac cause of her symptoms.

A right heart catheter reveals that the mixed venous O₂ saturation is 70%; the pulmonary capillary wedge O₂ saturation is 97%. The

haemoglobin is normal and the patient is afebrile.

Which of the following is the most appropriate statement that could be applied to her features?

- 1- Her cardiac output is decreased
- 2- Her cardiac output is normal
- 3- Her heart is normal
- 4- She has high-output failure
- 5- She is in shock due to a non-cardiac cause

Answer & Comments

Answer: 2- Her cardiac output is normal

The right heart and wedge catheters show normal saturations, the latter suggesting that she has good pulmonary oxygenation and so these features would argue against any failure.

Decreased or high output failure would certainly argue against shock of any sort; therefore, one cannot go as far as to say that she has a normal heart, so the best response (by a process of elimination) is that she has a normal output.



[Q: 1874] OnExamination 2012 - Cardiology

A 14-year-old boy presents with hypertension.

Which of the following statements concerning hypertension in the young is true?

- 1- Abnormalities are frequently seen on DMSA scan
- 2- Aortic coarctation is the commonest secondary cause
- 3- Headache is the usual presenting feature
- 4- It is defined as systolic blood pressure above the 99th centile for age
- 5- Sodium nitroprusside is useful for the long term treatment of severe cases

Answer & Comments

Answer: 1- Abnormalities are frequently seen on DMSA scan

Sodium nitroprusside is useful only in the short term, as cyanide levels accumulate with time.

Hypertension is usually diagnosed incidentally, and is defined as systolic blood pressure greater than the 95th centile for age.

Secondary causes are usually due to renal abnormalities, with reflux-associated scarring being the commonest renal disease. This will cause abnormalities on dimercaptosuccinic acid (DMSA) scan.

Coarctation of the aorta is the commonest non-renal cause, with pheochromocytoma/neuroblastoma, congenital adrenal hyperplasia, Cushing's syndrome and steroid therapy being rarer causes.



[Q: 1875] OnExamination 2012 - Cardiology

A 28-year-old man who is known to have hypertrophic cardiomyopathy (HCM) has an out of hospital cardiac arrest and is successfully resuscitated.

What is the most appropriate mode of treatment?

- 1- Alcohol septal ablation
- 2- Amiodarone
- 3- Beta-blocker
- 4- Implantable defibrillator
- 5- Myomectomy

Answer & Comments

Answer: 4- Implantable defibrillator

Patients with HCM are at increased risk of sudden cardiac death (SCD) due to ventricular fibrillation/tachycardia (VF/VT). Implantable

cardio-defibrillators (ICD) are superior to amiodarone or β -blockers for preventing this.

Reducing outflow tract obstruction with myomectomy or alcohol septal ablation does not reduce the risk of SCD.

Other indications for ICD implantation include:

Cardiac arrest due to VF/VT.

Sustained VT causing haemodynamic compromise.

Chronic heart failure, left ventricular ejection fraction (LVEF) less than 40% and associated syncopal episodes due to non-sustained VT post-myocardial infarction, non-sustained VT with LVEF less than 40%.

Arrhythmogenic right ventricular cardiomyopathy causing cardiac arrest.

Congenital long QT with family history of sudden cardiac death at young age.



[Q: 1876] OnExamination 2012 - Cardiology

A 56-year-old man presents to the Emergency department with an inferior myocardial infarction. He has a history of smoking and hypertension and is a poor attendee at the GP surgery.

On initial admission he is hypotensive and bradycardic, with clear inferior ST elevation. He is taken to the catheter lab and stented. You are asked to see him a few hours later as he is persistently hypotensive with poor urine output. He has remained pain free since his stenting.

On examination his BP is 90/50 mmHg, his pulse is 69, he has an elevated JVP, but his chest is clear.

Investigations show

Haemoglobin 14.0 g/dl (13.5-17.7)

White cell count $6.6 \times 10^9/L$ (4-11)

Platelets $188 \times 10^9/L$ (150-400)

Serum Sodium 138 mmol/l (135-146)

Serum Potassium 5.3 mmol/l (3.5-5)

Creatinine 131 $\mu\text{mol/l}$ (79-118)

Which of the following is the most appropriate next step?

1- IV Dobutamine

2- IV Fluid loading

3- IV Nitrate

4- Rescue angioplasty

5- Thrombolysis

Answer & Comments

Answer: 2- IV Fluid loading

This man has suffered a right ventricular infarction, leading to the classical picture of elevated JVP, no signs of left ventricular failure, and systemic hypotension.

The majority of patients improve after a fluid challenge, but this should not be continued if blood pressure fails to improve, as excessive fluid loading may contribute to worsening cardiogenic shock.

In patients who do not improve, monitoring of right-sided pressures is the next most appropriate step, with consideration of inotropes. Most patients with right ventricular infarction improve after 48-72 hours.



[Q: 1877] OnExamination 2012 - Cardiology

An 18-year-old with cerebral palsy is admitted after a respiratory arrest having been intubated by paramedics.

Nobody can gain intravenous access as the patient is too shut down. A femoral line is not possible due to contractures. You do not have the experience to perform central venous cannulation.

Which of the following is the best option for administering intravenous fluids/emergency

drugs in this situation of inability to gain venous access?

- 1- Down the endotracheal tube
- 2- Intramuscular (IM)
- 3- Intraosseous
- 4- Nasogastric
- 5- Subcutaneous

Answer & Comments

Answer: 3- Intraosseous

Nasogastric, IM and subcutaneous are too slow and unreliable for emergency situations (although in cardiac arrest the endotracheal route is recognised).

Venous cut down is a possibility but requires skill in the procedure.

Intraosseous is still perfectly viable in the adult patient 2 cm below the tibial tuberosity on the antero-medial side or 2 cm proximal to the medial malleolus.



[Q: 1878] OnExamination 2012 - Cardiology

A 59-year-old lady is admitted with a 30 minute history of heavy central chest pain associated with nausea and sweating.

Her ECG shows ST elevation in leads V1, V2, V3 and V4.

Which of the following coronary arteries is most likely to be occluded?

- 1- Circumflex artery
- 2- Left anterior descending artery
- 3- Obtuse marginal artery
- 4- Posterior descending artery
- 5- Right coronary artery

Answer & Comments

Answer: 2- Left anterior descending artery

An antero-septal myocardial infarction (MI) is due to an infarct in the territory of the left anterior descending artery.



[Q: 1879] OnExamination 2012 - Cardiology

An 54-year-old male re-develops chest pain 72 hours after treatment for an anterior myocardial infarction.

Which of the following markers will be the most sensitive in detecting reinfarction?

- 1- CK-MB
- 2- LDH
- 3- Myoglobin
- 4- Troponin I
- 5- Troponin T

Answer & Comments

Answer: 1- CK-MB

Although troponin is highly sensitive and specific it remains elevated for at least one week after infarction.

Similarly lactate dehydrogenase (LDH) will be present for approximately one week after infarction.

After myocardial infarction (MI), CK-MB levels become elevated within three to eight hours, peak within nine to 30 hours, and return to normal after 48 to 72 hours.

Although myoglobin has a short half life and rises quickly after an MI and is cleared after an MI, it is not specific enough for diagnostic use.



[Q: 1880] OnExamination 2012 - Cardiology

A publication reports the outcome of a new statin therapy in a placebo controlled primary prevention of ischaemic heart disease in a diabetic population.

1000 patients were randomised to receive the new therapy and 1000 allocated to placebo. The study was completed over a five year period.

In the placebo group there were 150 myocardial infarcts (MI) and in the group treated with the new statin there were 100 myocardial infarcts.

What is the number needed to treat to prevent one MI over the course of this study?

- 1- 10
- 2- 20
- 3- 30
- 4- 40
- 5- 50

Answer & Comments

Answer: 2- 20

You treat 1000 patients for five years with the new statin and prevent 50 MIs.

Thus the number needed to treat (NNT) to prevent one MI is 20 (1000/50).

This statistical figure provides us with a lot of information regarding the efficacy of a treatment rather than purely statistically significant data.

As it stands, you may expect to prevent an infarct by treating as few as 20 patients over five years from these data.

Furthermore, cost economic data can be calculated from such results by factoring in how much the drug costs against all the costs of treating and rehabilitating a patient with an MI.



[Q: 1881] OnExamination 2012 - Cardiology

A 69-year-old man is treated for chest infection.

He has been on a stable dose of warfarin for the last six months as a treatment for atrial fibrillation, with INR recordings between 2-2.5. However, his most recent INR was 5 (<1.4).

Which one of the following drugs that has recently been started is likely to be responsible for the increased INR?

- 1- Clarithromycin
- 2- Co-dydramol
- 3- Digoxin
- 4- Rifampicin
- 5- Temazepam

Answer & Comments

Answer: 1- Clarithromycin

Clarithromycin induces the anticoagulant effect of warfarin, whereas rifampicin would reduce the anticoagulant effect.

Ciprofloxacin and sulphonamides will also increase the anticoagulant effect of warfarin.

Temazepam, digoxin and codeine have no appreciable effect.



[Q: 1882] OnExamination 2012 - Cardiology

A 50-year-old politician presented with a strange fluttering sensation in his chest, but no chest pain. The symptoms had lasted 24 hours.

An ECG revealed atrial fibrillation with a ventricular rate of 130 beats per minute.

Which one of the following drugs is most likely to restore sinus rhythm?

- 1- Adenosine
- 2- Bisoprolol
- 3- Digoxin
- 4- Flecainide
- 5- Verapamil

Answer & Comments

Answer: 4- Flecainide

Flecainide is the drug most likely to restore sinus rhythm in atrial fibrillation.

Care is required in patients who may have left ventricular (LV) dysfunction, although this is unlikely in a previously fit, relatively young, patient.

Adenosine is used to cardiovert supraventricular tachycardia (SVT).

Digoxin and bisoprolol are indicated for rate control and are not normally associated with the restoration of sinus rhythm.

Verapamil can be used for rate control in atrial fibrillation, and may be used in the treatment of SVT.



[Q: 1883] OnExamination 2012 - Cardiology

A 72-year-old man noted to have a systolic murmur undergoes an echocardiogram which demonstrates aortic stenosis.

Which of the following is associated with a poor prognosis in this patient?

- 1- Aortic regurgitation
- 2- Cardiomegaly on chest x ray
- 3- Clinical features of left ventricular failure
- 4- ECG evidence of left ventricular hypertrophy
- 5- Severe valvular calcification on echocardiogram

Answer & Comments

Answer: 3- Clinical features of left ventricular failure

Aortic stenosis is associated with a worse prognosis when accompanied by left ventricular (LV) dysfunction.

Other predictors of a poorer prognosis include:

Increasing gradient across the valve (above 70 mmHg)

Age of patient and

Symptomatology.

Although the severity of valvular calcification is prognostically important in an asymptomatic patient the most important predictor is LV function.



[Q: 1884] OnExamination 2012 - Cardiology

A 69-year-old woman admitted for a surgical procedure is noted to have a soft systolic murmur at the left sternal edge.

Her ECG and chest x ray were normal and transthoracic echocardiography revealed a small posterior pericardial effusion with normal valves.

Which of the following would be the most appropriate next step in this patient's management?

- 1- A diagnostic pericardial aspiration
- 2- Mammography
- 3- Purified protein derivative test for tuberculosis
- 4- Reassurance
- 5- Right heart catheterisation

Answer & Comments

Answer: 4- Reassurance

The presence of a small pericardial effusion on echo is quite common and in this patient who otherwise appears well, no further action is required.



[Q: 1885] OnExamination 2012 - Cardiology

A 60-year-old man's echocardiogram shows a dilated left ventricular (LV) cavity with the

remainder of the other chamber sizes normal.

Which of the following is the most likely diagnosis?

- 1- Aortic regurgitation (AR)
- 2- Aortic stenosis (AS)
- 3- Hypertensive heart disease
- 4- Mitral regurgitation (MR)
- 5- Mitral stenosis (MS)

Answer & Comments

Answer: 1- Aortic regurgitation (AR)

No echocardiographic data are provided regarding the valves, but a volume overload as with AR would result in dilatation of the left ventricle.

MR, AS, and hypertension would have the effect of causing hypertrophy and a smaller LV cavity.

MS would have little effect on LV dimensions.



[Q: 1886] OnExamination 2012 - Cardiology

A 60-year-old man has a three month history of worsening dyspnoea. He has been healthy all his life with no major illnesses.

His blood pressure is 118/92 mmHg, he has a murmur and has audible crackles at both bases. His serum glucose is 5.6 mmol/L (3.0-6.0). His total serum cholesterol is 4.8 mmol/L (<5.2). The serum creatine kinase is not elevated.

What is the most likely explanation for these findings?

- 1- Alcoholic cardiomyopathy
- 2- Aortic dissection
- 3- Calcified bicuspid aortic valve
- 4- Mitral valve annulus calcification
- 5- Tricuspid valve endocarditis

Answer & Comments

Answer: 3- Calcified bicuspid aortic valve

The clinical signs point to a left-sided heart failure which would discount alcoholic cardiomyopathy as it would be biventricular and tricuspid valve endocarditis which would be right sided.

There are no acute symptoms and the history is not sudden to suggest aortic dissection.

Mitral valve calcification is an incidental finding at echocardiography (ECHO).

This leaves a calcified bicuspid aortic valve leading to aortic stenosis as the likely explanation.



[Q: 1887] OnExamination 2012 - Cardiology

An elderly gentleman is brought to the Emergency department after suffering a witnessed collapse in a supermarket. A passerby came to his aid immediately and he regained consciousness quickly. His usual state of health is good and he is independent.

On arrival his GCS is 15/15. Blood pressure is 101/72 mmHg. Pulse is 40 regular. Cardiovascular, respiratory and neurological examination is normal.

A 12 lead ECG demonstrates a bradycardia with no obvious association between the QRS complexes and P waves. You call the cardiology registrar for help. You talk to the patient about his problem and when pacemakers are needed.

With regard to this, from the list below, which is an absolute indication for a permanent pacemaker?

- 1- Bifascicular block
- 2- Mobitz Type I with symptoms
- 3- First degree heart block without symptoms
- 4- Acquired third degree heart block without symptoms

5- Trifascicular block

Answer & Comments

Answer: 4- Acquired third degree heart block without symptoms

Indications for permanent pacemakers are a common cardiology topic in examinations.

There is a long list of relative and absolute indications for permanent pacemakers. These are based on international guidelines.

Complete heart block (whether symptomatic or not) is a indication for a permanent pacemaker as there is an inherent risk of asystole.

Option B is a relative indication (Mobitz type I) with symptoms.

Generally, permanent pacing can be justified for any degree of heart block associated with symptoms of bradycardia.

Options A and E are only absolute indications if they are associated with heart block.



[Q: 1888] OnExamination 2012 - Cardiology

A 17-year-old boy was seen in the Emergency department for worsening shortness of breath and wheeze.

He has a two year history of asthma which responds to high doses of oral steroids. Further history revealed tingling and numbness affecting his toes for few months. He was given a full course of antibiotics and oral steroids by the GP but this did not help.

He does not have any other co-morbidities. There is no family history of note. He does not smoke and does not drink alcohol. His exercise tolerance has been gradually deteriorating. There is no history of foreign travel.

The examination revealed pulse 104/min, BP 125/70 mmHg, respiratory rate 22/min, apyrexial, and oxygen saturations 97% on

room air. There was bilateral wheeze in the chest and vesicular breath sounds.

Neurological examination revealed decreased sensation in a stocking distribution. The rest of the neurological and systemic examination was normal.

The initial blood results reveal:

Hb 10.5 g/l (13.0 - 18.0 g/dL)

WCC 10.4 ($4 - 11 \times 10^9/L$)

Neutrophils 2.06 ($1.5 - 7 \times 10^9/L$)

Lymphocytes 1.77 ($1.5 - 4 \times 10^9/L$)

Eosinophils 4.0 ($0.04 - 0.4 \times 10^9/L$)

Urea 4.4 (2.5 - 7.5 mmol/L)

Creatinine 115 (60 - 110 $\mu\text{mol/L}$)

Urine dipstick was positive for blood. Chest x ray was normal.

What is the most likely diagnosis?

- 1- Atopic asthma
- 2- Atypical pneumonia
- 3- Churg-Strauss syndrome
- 4- Goodpasture's syndrome
- 5- Glomerulonephritis

Answer & Comments

Answer: 3- Churg-Strauss syndrome

Churg-Strauss syndrome is a rare type of vasculitis affecting small to medium sized vessels.

It typically presents with asthma and high eosinophilic count. It can involve other systems as in this question, inflammation of vasa nervosum giving rise to symptoms of peripheral neuropathy, vasculitis of renal vessels giving rise to microscopic haematuria and mild renal impairment. Multisystem abnormality should raise the possibility of vasculitis.

Regarding the options:

A. Asthma would not explain the other symptoms in the patient such as peripheral neuropathy, raised eosinophils, impaired renal functions along with microscopic haematuria.

B. Similarly atypical pneumonia would not explain all the symptoms. The patient has a normal CXR which would make this choice less likely.

C. Churg-Strauss syndrome is a rare vasculitis. This question presents the typical picture of a patient with Churg-Strauss syndrome with asthma, mild renal impairment, microscopic haematuria, raised eosinophilic count. This vasculitis involves small to medium sized blood vessels (capillaries, venules, arterioles).

The American College of Rheumatology (ACR) has proposed six criteria for the diagnosis of Churg-Strauss syndrome. The presence of four or more criteria yields a sensitivity of 85% and a specificity of 99.7%.

These criteria include:

Asthma (wheezing, expiratory rhonchi)

Eosinophilia of more than 10% in peripheral blood

Paranasal sinusitis

Pulmonary infiltrates (may be transient)

Histological proof of vasculitis with extravascular eosinophils, and

Mononeuritis multiplex or polyneuropathy.

Management includes glucocorticoids, and immunosuppressant drugs (cyclophosphamide, azathioprine, mycophenolate).

D. Normal CXR and absence of haemoptysis are against Goodpasture's syndrome. Patients with Goodpasture's syndrome have positive anti-GBM antibodies.

E. Evidence of microscopic haematuria does suggest underlying glomerulonephritis, but again this diagnosis alone is not sufficient to explain the whole picture.



[Q: 1889] OnExamination 2012 - Cardiology

A 70-year-old known hypertensive and diabetic patient presents with dyspnoea on moderate exertion.

On examination he is pale, his pulse rate is 98/min regular, BP is 160/70 mmHg and there are fine basal crepitations in the lungs. ECG showed left ventricular hypertrophy and renal functions were slightly deranged.

What is the most appropriate treatment for cardiac failure in this patient?

1- ACE-I alone

2- Furosemide alone

3- Spironolactone, ramipril and aspirin

4- Spironolactone, ramipril and carvedilol

5- Spironolactone, ramipril and digoxin

Answer & Comments

Answer: 4- Spironolactone, ramipril and carvedilol

All patients with cardiac failure should be on ACE-I if there is no contraindication.

In this patient there will be an additional benefit for hypertension and prevention of diabetic nephropathy. Once stable β blocker should be added. It is proven that cardioselective β blockers have important beneficial effects especially in patients with underlying coronary artery disease. Randomised Aldactone evaluation study (RALES) trial showed 30% reduction in mortality when spironolactone (25 mg) was added to the standard therapy.

Digoxin is used in heart failure with atrial fibrillation. As it is a weak positive inotrope, its role in heart failure with sinus rhythm may be best reserved if the patient remains symptomatic despite optimal therapy. Old people with renal impairment are at increased risk of toxicity.



[Q: 1890] OnExamination 2012 -
Cardiology

A 57-year-old man develops deep venous thrombosis during a hospitalisation for prostatectomy.

He exhibits decreased mental status with right hemiplegia, and a CT scan of the head suggests an acute cerebral infarction in the distribution of the left middle cerebral artery.

A chest x ray reveals cardiac enlargement and prominence of the main pulmonary arteries that suggests pulmonary hypertension. His serum troponin I is <0.4 ng/ml.

Which of the following lesions is most likely to be present on echocardiography?

- 1- Coarctation of the aorta
- 2- Dextrocardia
- 3- Pulmonary stenosis
- 4- Tetralogy of Fallot
- 5- Ventricular septal defect

Answer & Comments

Answer: 5- Ventricular septal defect

This is 'paradoxical embolus' from right to left. This can only happen if there is a defect that allows passage from right to left. This can happen across a patent foramen ovale.

In this case, the pulmonary hypertension suggests that there may have been a shunt persistent for a long time - Eisenmenger complex.

An atrial or a ventricular septal defect can provide the shunt.



[Q: 1891] OnExamination 2012 -
Cardiology

A 55-year-old man is being treated for hyperlipidaemia with atorvastatin 40 mg nocte.

He has a history of ischaemic heart disease.

His fasting lipids show:

Total cholesterol 3.8 mmol/l (<5.2)

Triglycerides 1.3 mmol/l (0.5-1.7)

LDL-cholesterol 1.9 mmol/l (<2.6)

HDL-cholesterol 0.7 mmol/l (0.7-1.7)

Which of the following changes of treatment would be expected to raise his HDL cholesterol level by the greatest amount?

- 1- Add cholestyramine
- 2- Add ezetimibe
- 3- Add fenofibrate
- 4- Add nicotinic acid
- 5- Switch atorvastatin to rosuvastatin

Answer & Comments

Answer: 4- Add nicotinic acid

Nicotinic acid is highly effective at raising high density lipoprotein (HDL) cholesterol but it is often poorly tolerated. Sustained release versions are less likely to induce flushing.

It is important to remember that although low HDL-C is associated with increased cardiovascular risk in large epidemiological studies, it is still unclear if giving treatment to increase HDL-C will reduce mortality. A large trial is underway to establish if pharmacologically raising HDL-C with nicotinic acid improves outcomes.

"Nicotinic acid is the most powerful HDL-cholesterol raising agent currently available, and a combination of this agent with a statin facilitates simultaneous control of both HDL-cholesterol and LDL-cholesterol."

Reference:

European Heart Journal Supplements, 2006, Volume 8, Suppl F, pages F23-F29



[Q: 1892] OnExamination 2012 -
Cardiology

A 60-year-old lady is taking warfarin for stroke prevention in atrial fibrillation.

She presents with a markedly raised INR.

Which of the following medications is the most likely to be the reason?

- 1- Aspirin
- 2- Carbamazepine
- 3- Ciprofloxacin
- 4- Flucloxacillin
- 5- St John's wort

Answer & Comments

Answer: 3- Ciprofloxacin

Ciprofloxacin is an inhibitor of p450 and therefore prolongs the half life of warfarin and raises the international normalised ratio (INR).

Even patients are aware of the increased risk of bleeding with aspirin but it does not have a clear relationship with INR.



[Q: 1893] OnExamination 2012 -
Cardiology

A 65-year-old male presents with arthralgia and sleep disturbance following the introduction of simvastatin.

He has a history of hypertension and ischaemic heart disease for which he is receiving aspirin, atenolol and eprosartan together with simvastatin 40 mg OD which has been introduced in the last one month. Previously, he had been taking atorvastatin but this was changed to simvastatin after he complained of arthralgia.

Investigations reveal:

Creatine phosphokinase (CPK) 156 U/l (40-170)

Total cholesterol 5.1 mmol/l (<5.2)

LDL-cholesterol 3.1 mmol/l (<2.5)

Triglycerides 1.7 mmol/l (0.45-1.69)

HDL-cholesterol 1.2 mmol/l (>1.55)

Which is the most appropriate treatment for his lipid profile?

- 1- Ezetimibe
- 2- Fenofibrate
- 3- Nicotinic acid slow release
- 4- Omega-3 fatty acids
- 5- Rosuvastatin

Answer & Comments

Answer: 1- Ezetimibe

The primary treatment target in this case is a total cholesterol (TC) less than 4 mmol/l and low-density lipoprotein cholesterol (LDL C) less than 2.5 mmol/l. Plasma triglyceride and high-density lipoprotein cholesterol (HDL-C) are already at the currently accepted target levels.

This patient describes typical statin-associated side effects which are generally a class effect and dose related. The most common adverse event with statin therapy is arthralgia or myopathy, often with normal CPK levels.

Myositis and rhabdomyolysis are rare statin-associated myopathy side effects and are defined on the basis of CPK levels greater than 10x normal along with features of muscle pain and myoglobinuria (for rhabdomyolysis).

Risk factors predisposing to statin myopathy include advanced age, trauma, thyroid dysfunction and concomitant medication that can raise statin bioavailability including amiodarone, verapamil and many other agents that are metabolised by the cytochrome P450 enzyme system.

Ezetimibe monotherapy produces reductions in TC and LDL-C of around 20%, and since tolerability issues are likely to occur with another statin ezetimibe is the best treatment option.

Clinical trial data have demonstrated continuing event rate reduction to LDL-C levels below 2 mmol/l, and a meta-analysis of lipid lowering trials has demonstrated a 1 mmol/l reduction in LDL-C is associated with a 23% RRR in CHD events, irrespective of baseline risk and the method of cholesterol reduction.



[Q: 1894] OnExamination 2012 - Cardiology

You are on call for hospital at night and are urgently called to a patient on the ward who is choking on a piece of steak visible in his oropharynx. He is in extremis with saturations of 87%.

Which of the following is the most appropriate immediate management for this patient?

- 1- Finger sweep
- 2- Heimlich manoeuvre
- 3- High flow oxygen
- 4- Cricothyroidotomy
- 5- Removal with forceps

Answer & Comments

Answer: 2- Heimlich manoeuvre

A finger sweep is more likely to push the obstruction further into the airway and is no longer advocated.

High flow oxygen is the breathing part of A, B, C, and the airway is not clear.

Nasopharyngeal airways will not help in this situation.

Removal with forceps is potentially hazardous.

A Heimlich manoeuvre should be performed with the possibility of cricothyroidotomy in mind immediately thereafter if this procedure fails.



[Q: 1895] OnExamination 2012 - Cardiology

A 65-year-old man is admitted with central crushing chest pain, sweating and vomiting of one hour duration.

He is conscious with a pulse rate of 100 bpm and a blood pressure of 180/110 mmHg. An ECG shows >2 mm ST elevation in leads II, III, aVF.

FBC: normal

U & E: normal

Troponin T: 100 ng/ml

Apart from the presence of xanthelasma (+) there are no other positive findings on clinical examination.

He is given oxygen, aspirin, clopidogrel, morphine and intravenous 5 mg atenolol.

What is the best next step?

- 1- Give thrombolysis immediately
- 2- Immediate referral to cardiologist for primary angioplasty
- 3- Prescribe low molecular weight heparin
- 4- Prescribe simvastatin
- 5- Transfer to coronary care unit for closer monitoring

Answer & Comments

Answer: 2- Immediate referral to cardiologist for primary angioplasty

This is a case of acute inferior ST elevation myocardial infarction (MI), so the next appropriate management in this case is urgent referral for primary angioplasty.

Early revascularisation for ST elevation MI improves prognosis and outcome.

Thrombolysis is less successful than primary angioplasty at restoring flow and has higher bleeding complications.

Monitoring on CCU is appropriate after revascularisation.

Low molecular weight has no benefit in ST elevation MI.

Statin therapy is not required immediately.



[Q: 1896] OnExamination 2012 - Cardiology

A 17-year-old female loses consciousness whilst out jogging one afternoon.

She has had similar blackouts over the last two to three years which have all occurred during exertion. There is no family history of note. She is taken to the Emergency department, where a chest x ray, CT brain scan, FBC, and biochemistry are all normal. Her ECG shows changes of left ventricular hypertrophy and broad Q waves. An echocardiogram reveals left ventricular and septal hypertrophy, small left ventricle, and reduced septal excursion. The septum has a "ground glass" appearance.

Which of the following conditions is she most likely to have?

- 1- Diabetes mellitus
- 2- Hypertrophic cardiomyopathy
- 3- Rheumatic heart disease
- 4- Systemic lupus erythematosus
- 5- Viral myocarditis

Answer & Comments

Answer: 2- Hypertrophic cardiomyopathy

The history of collapses in this young woman with echocardiographic features of hypertrophy are highly suggestive of hypertrophic obstructive cardiomyopathy.

Hypertrophic cardiomyopathy is defined as the unexplained, asymmetrical or concentric hypertrophy of the undilated left ventricle.

There is also hypertrophy of the right ventricle.

Incidence is approximately 1 in 500. It is inherited as an autosomal dominant trait but

often an inheritance pattern is not found on questioning.



[Q: 1897] OnExamination 2012 - Cardiology

A 54-year-old man presents with central crushing chest pain. Examination is normal.

12-lead ECG shows ST segment elevation in leads II, III, aVF and ST depression in V1, V2 and V3.

Which coronary artery is occluded?

- 1- Circumflex
- 2- Left anterior descending
- 3- Left main stem
- 4- Obtuse marginal
- 5- Right coronary artery

Answer & Comments

Answer: 5- Right coronary artery

The ECG describes an infero-posterior myocardial infarction (MI). This territory is supplied by a dominant right coronary artery. The concept of coronary dominance refers to which coronary artery supplies the posterior descending coronary artery.

In the case of approximately 85% of patients this is the right coronary artery with about 15% of patients having a dominant left circumflex. The territories supplied by the arteries are as follows:

Circumflex: lateral

Left anterior descending: anterior and septum

Left main stem: branches into the left anterior descending artery and circumflex and supplies most of the left ventricle. Complete left main stem occlusion is invariably fatal.

Obtuse marginal: one of the branches of the circumflex and supplies the 'high lateral'

region of the left ventricle (ECG leads I and aVR).

Basic understanding of coronary anatomy is important, as this is predictive of problems following MI.

For example, the right coronary artery supplies the AV node, so heart block following inferior MI is common. However, heart block following anterior MI is a grave prognostic marker as this indicates a large anterior wall infarct.

The right coronary system also supplies the right ventricle, hence problems relating to a right ventricular infarct are commonly associated with an inferior MI.



[Q: 1898] OnExamination 2012 - Cardiology

A 47-year-old lady is admitted to the coronary care unit with symptoms suggestive of decompensated heart failure. She has a history of severe mitral regurgitation secondary to mitral prolapse and is awaiting valve surgery. You are asked to admit the patient and the medical student attached to the firm asks to come with you. You take a full history and examine the patient, making sure to point out all the relevant clinical features to the medical student.

After you finish seeing the patient you discuss the case with the medical student. She asks you the most common cause of mitral regurgitation (MR).

What should be your response to the medical student's question?

- 1- Collagen vascular disease
- 2- Infective endocarditis
- 3- Myxomatous degeneration
- 4- Rheumatic fever
- 5- Rupture of the chordate tendinae

Answer & Comments

Answer: 3- Myxomatous degeneration

Myxomatous degeneration of the mitral valve is by far the most common cause of MR in the United Kingdom. The others listed are less common causes.

The management of severe MR is surgery; either replacement or repair, depending on the anatomy.

A percutaneous repair with clips is possible in some patients unsuitable for conventional surgery.



[Q: 1899] OnExamination 2012 - Cardiology

Which of the following mechanisms best explains the action of ezetimibe?

- 1- Activates PPAR-alpha
- 2- Bile acid sequestration
- 3- Decreases hepatic cholesterol synthesis
- 4- Increases peroxisomal beta-oxidation of fatty acids
- 5- Inhibits cholesterol absorption

Answer & Comments

Answer: 5- Inhibits cholesterol absorption

Ezetimibe localises at the brush border of the small intestine, where it inhibits the absorption of cholesterol from the diet.



[Q: 1900] OnExamination 2012 - Cardiology

A 60-year-old woman has a systolic murmur.

As part of the evaluation you listen to the murmur during a Valsalva manoeuvre and the murmur becomes louder.

Which of the following systolic murmurs becomes louder with a Valsalva?

- 1- Aortic stenosis

- 2- Hypertrophic obstructive cardiomyopathy
- 3- Mitral flow murmur
- 4- Mitral regurgitation
- 5- Ventricular septal defect

Answer & Comments

Answer: 2- Hypertrophic obstructive cardiomyopathy

Most murmurs of stenosis or regurgitation are exaggerated during squatting and get softer with the Valsalva manoeuvre.

The exceptions are hypertrophic cardiomyopathy (HOCM) where the opposite occurs and mitral valve prolapse where the murmur gets longer.



[Q: 1901] OnExamination 2012 - Cardiology

A 57-year-old male is admitted with acute dyspnoea and chest pain. A pulmonary embolism (PE) is confirmed.

Which of the following is a recognised feature of a significant pulmonary embolism?

- 1- An arterial pH less than 7.2
- 2- An increase in serum troponin levels
- 3- Blood gases show increased pCO₂ on air
- 4- Normal D-dimer levels
- 5- Reduced plasma lactate levels

Answer & Comments

Answer: 2- An increase in serum troponin levels

Cardiac troponins are reliable markers of myocardial injury that are increasingly being used to diagnose an acute coronary syndrome in patients presenting with undifferentiated chest pain or dyspnoea.

If elevated cardiac troponin levels also occur in patients with pulmonary embolism because

of right ventricular dilation and myocardial injury, such patients could be misdiagnosed.

'We performed a prospective cohort study to determine the prevalence of elevated cardiac troponin I (cTnI) levels in patients with submassive pulmonary embolism.

Methods: Consecutive patients with objectively confirmed submassive pulmonary embolism and no previous history of ischemic heart disease, other cardiac disease or renal insufficiency, were included. Creatine kinase and cTnI levels were measured within 24 hours of clinical presentation on two occasions eight to 12 hours apart.

Results: Of 24 patients with submassive pulmonary embolism, five (20.8%) had elevated cTnI levels of 0.4 microg/L or higher (95% confidence interval, 7.1-42.2%). One of these patients had a cTnI level higher than 2.3 µg/L that was suggestive of myocardial infarction.

Conclusion: Pulmonary embolism should be considered in the differential diagnosis of patients presenting with undifferentiated chest pain or dyspnoea and an elevated cardiac troponin level.'

Hypoxaemia and hypocapnoea are common after major pulmonary embolism and may also be found after more minor events. Absence of these phenomena, on the other hand, by no means excludes embolism and their presence is non-specific.

In suspected minor embolism this investigation is, at best, only of marginal value. The precise stimulus to hyperventilation is unknown and there is also difficulty in understanding the reasons for hypoxaemia when it is present.

Reference:

Arch Intern Med, 162(1): 79-81 2002



[Q: 1902] OnExamination 2012 - Cardiology

A 45-year-old man presents with a rash.

On examination you find he has eruptive xanthoma.

Which of the following is the most likely diagnosis?

- 1- Familial combined hyperlipidaemia
- 2- Familial hypercholesterolaemia
- 3- Familial hypertriglyceridaemia
- 4- Hyperlipidaemia associated with nephrotic syndrome
- 5- Remnant hyperlipidaemia

Answer & Comments

Answer: 3- Familial hypertriglyceridaemia

Eruptive xanthomas occur in a number of types of hypertriglyceridaemia often with high chylomicrons.

They are yellow papules affecting the extensor surfaces, buttocks and legs. Affected patients may also have fatty liver on ultrasound and foam cells in the bone marrow due to the high triglyceride concentrations.

Causes include types I & V hyperlipidaemia, type III hyperlipidaemia (remnant disease) and hypertriglyceridaemia due to secondary causes such as alcohol, diabetes and obesity.

Of those listed the most likely is familial hypertriglyceridaemia.



[Q: 1903] OnExamination 2012 - Cardiology

A 58-year-old man presents with sudden onset chest pain. He has a known history of ischaemic heart disease.

ECG shows ST segment elevation in V1-V5 without reciprocal depression.

In which territory is the infarction most likely to have taken place?

- 1- Anterior
- 2- Inferio-lateral
- 3- Inferior
- 4- Lateral
- 5- Posterior

Answer & Comments

Answer: 1- Anterior

This myocardial infarction (MI) is likely to be in the left anterior descending coronary artery (LAD) and represents an anterior MI.



[Q: 1904] OnExamination 2012 - Cardiology

A 58-year-old male presents with acute dyspnoea following a convulsion.

On examination his blood pressure was 240/120 mmHg and fundal examination reveals papilloedema with haemorrhages and cotton wool spots. His urea, electrolytes and creatinine are normal but chest x ray reveals pulmonary oedema and cardiomegaly.

Which one of the following is the most appropriate immediate treatment?

- 1- Atenolol 50 mg orally
- 2- Intravenous labetalol
- 3- Intravenous sodium nitroprusside
- 4- Nifedipine 5 mg sublingually
- 5- Nifedipine LA 30 mg orally

Answer & Comments

Answer: 3- Intravenous sodium nitroprusside

This patient has malignant hypertension with papilloedema, convulsions and pulmonary oedema (thus excluding the use of a β -blocker in the acute setting).

This constitutes a medical emergency, with nitroprusside being the treatment of choice.



[Q: 1905] OnExamination 2012 -
Cardiology

A 65-year-old man has long-standing stable heart failure treated with furosemide and enalapril.

He complains of swelling in his left knee and his GP treats him with celecoxib, a cyclo-oxygenase-2 (COX-2) inhibitor. Two weeks later the patient has increasing breathlessness and ankle oedema.

Which one of the following effects of celecoxib is the most likely to explain his symptoms?

- 1- Decreased absorption of furosemide from the gut
- 2- Decreased myocardial contractility
- 3- Reduced effective action of enalapril
- 4- The onset of anaemia
- 5- The onset of fluid retention

Answer & Comments

Answer: 5- The onset of fluid retention

Celecoxib (rofecoxib has been withdrawn) acts by inhibiting prostaglandin synthesis via inhibition of cyclo-oxygenase-2 (COX-2).

It causes fluid retention and can worsen an already pre-existing heart failure as in this case.

The CSM reminds prescribers that celecoxib is contraindicated in patients with severe congestive heart failure, active peptic ulceration or gastrointestinal bleeding.



[Q: 1906] OnExamination 2012 -
Cardiology

A new antihypertensive drug needs to be investigated to establish its relative potency.

Which of the following techniques is most appropriate for this purpose?

- 1- Bioassay
- 2- Case-control study

- 3- Double blind, randomised, placebo controlled study
- 4- Postmarketing surveillance
- 5- Sequential trial

Answer & Comments

Answer: 1- Bioassay

Biological assays are designed to measure the relative potency of different preparations.

Blood pressure is highly variable and is subject to variability because of the patient's level of anxiety and the method used by the observer to measure it.

In a test of efficacy of an antihypertensive drug, a double blind, randomised design would be favourable.

A sequential trial (a trial in which the data are analysed after each participant's results become available and the trial continues until a clear benefit is seen in one of the comparison groups) could also be used to assess efficacy, but there would have to be a large expected difference from placebo.



[Q: 1907] OnExamination 2012 -
Cardiology

Which of the following concerning congenital heart disease is correct?

- 1- ASD is the commonest malformation at birth
- 2- Congenital complete heart block is not usually associated with anti-Ro antibodies in the mother
- 3- Ebstein's anomaly is associated with maternal exposure to lithium carbonate
- 4- Hypoplastic left heart syndrome is characterised by a large, dilated left ventricle
- 5- Osteogenesis imperfecta is associated with aortic stenosis

Answer & Comments

Answer: 3- Ebstein's anomaly is associated with maternal exposure to lithium carbonate

A ventricular septal defect (VSD) is the commonest at 30%, atrial septal defect (ASD) is 10%.

Aortic regurgitation may be a feature of osteogenesis imperfecta.

Ebstein's anomaly is associated with maternal LiCO₃ use if exposed in the first trimester.

The majority of cases of neonates with complete heart block may be caused by autoimmune disease, particularly anti-Ro antibodies in the mother.

Left ventricular (LV) hypoplasia occurs when the left-sided chambers fail to develop and blood enters the systemic circulation from the right ventricle via the pulmonary artery and a patent ductus arteriosus.



[Q: 1908] OnExamination 2012 - Cardiology

A 15-year-old female presents following a sore throat with chest pain, fever, and a skin rash.

Examination reveals a diastolic murmur. Her ASO titre is elevated.

Which of the following is a major criterion for the diagnosis of rheumatic fever?

- 1- Fever
- 2- Migratory erythema
- 3- Polyarthrititis
- 4- Prolonged PR interval
- 5- Raised ESR

Answer & Comments

Answer: 3- Polyarthrititis

Polyarthrititis together with:

Erythema marginatum
Sydenham's chorea

Carditis and

Subcutaneous nodules

constitute the major criteria associated with rheumatic fever.

Minor criteria include:

Raised erythrocyte sedimentation rate (ESR)

Arthralgia

Pyrexia and

A prolonged PR interval.

Migratory erythema is associated with a glucagonoma.



[Q: 1909] OnExamination 2012 - Cardiology

A 38-year-old patient with recent onset fatigue and prior hypertension presents to the endocrinology clinic as his potassium remains low on oral supplements. He has no medical history of note.

A full endocrine profile is requested at the clinic, though the most recent available blood tests demonstrate ongoing hypokalaemia:

Full blood count normal

Serum Sodium 138[132 - 144 mmol/l]

Serum potassium 2.6[3.5 - 5.0 mmol/l]

Urea 6.4[2.5 - 7.5 mmol/l]

Creatinine 70[50 - 120 µmol/l]

What imaging would you carry out?

- 1- Abdominal x ray
- 2- Barium swallow
- 3- Chest x ray
- 4- CT abdomen
- 5- CT brain

Answer & Comments

Answer: 4- CT abdomen

Low potassium in conjunction with hypertension points toward the diagnosis of

primary hyperaldosteronism, or Conn's syndrome.

A more complete biochemical profile would demonstrate alkalosis. The hypokalaemia is often refractory to supplements. As the name suggests, aldosterone levels are high and this suppresses renin levels.

Liddle's syndrome, a rare genetic abnormality of Na⁺ channels, has a similar clinical presentation of fatigue, hypertension and hypokalaemia, though the sodium is usually higher.

Aldosterone levels are high in Conn's syndrome and low-normal in Liddle's syndrome, and were likely checked prior to imaging.

CT or MRI of the abdomen readily identifies a secretory adrenal adenoma, which is not readily evident on abdominal x ray, subsequently managed by adrenalectomy.

CT brain may be indicated in hypokalaemia, with and without hyponatraemia (which may have been corrected too rapidly), to look for central pontine myelinolysis in the very different setting of alcoholic Korsakoff's syndrome with vitamin and electrolyte deficiencies.

None of the other options are of relevance.

Reference:

Moser M et al. NEJM 2006; 355: 385-92: Review on resistant hypertension.



[Q: 1910] OnExamination 2012 - Cardiology

Which of the following is an absolute contraindication to β blockers?

- 1- Psoriasis
- 2- Diabetes
- 3- Peripheral vascular disease
- 4- Mild COPD
- 5- Heart block

Answer & Comments

Answer: 5- Heart block

The JBS 2005 guidelines list asthma or heart block as 'compelling contraindications' to β blockers as life-threatening complications may occur.

All the other options may be exacerbated by β blockers and so are considered 'relative' contraindications.



[Q: 1911] OnExamination 2012 - Cardiology

A 70-year-old man presented with a 40 minute history of heavy chest pain and sweating.

On examination his pulse is 85 bpm and BP 200/110 mmHg. ECG shows ST elevation in leads V2 - V5 and ST depression in leads II and aVF. Diamorphine, oxygen and aspirin have been given.

Which of the following is the most appropriate next step?

- 1- Anticoagulation
- 2- CT thorax
- 3- Intravenous nitrate infusion
- 4- Observe and repeat ECG
- 5- Thrombolysis

Answer & Comments

Answer: 3- Intravenous nitrate infusion

This man is presenting with an acute myocardial infarction (MI) which should be thrombolysed. However, his blood pressure is a contraindication.

Intravenous nitrate infusion is often used in these circumstances (along with adequate analgesia to control pain) to manage the BP before thrombolysis.



[Q: 1912] OnExamination 2012 -
Cardiology

In Down's syndrome, which is the most common congenital heart defect?

- 1- Atrial septal defect
- 2- Atrioventricular septal defect
- 3- Patent ductus arteriosus
- 4- Tetralogy of Fallot
- 5- Ventricular septal defect

Answer & Comments

Answer: 2- Atrioventricular septal defect

Fifty per cent of Down's syndrome births have congenital heart disease.

Defects in order of decreasing frequency are:
B, E, C, D and A.



[Q: 1913] OnExamination 2012 -
Gastroenterology

A 35-year-old obese Afro-Caribbean lady presents with mild jaundice. She claims to be a teetotaler and her BMI is 30 kg/m².

Investigations reveal the following results.

Haemoglobin 14 g/dL (11.5-16.5)

U+Es Normal

Bilirubin 25 µmol/L (1-22)

Aspartate transaminase 140 U/L (1-31)

Alanine transaminase 155 U/L (5-35)

Alkaline phosphatase 160 U/L (60-110)

Random blood glucose 11.2 mmol/L (3.0-6.0)

Hepatitis A IgG Positive

Hepatitis B and C screening Negative

Anti-nuclear antibodies 1:16 titre

Ultrasound abdomen reveals hyperechogenic hepatic parenchyma.

Liver biopsy reveals lesions suggestive of alcoholic liver disease.

On review of her notes, liver function tests performed six months previously showed similar values.

Which of the following is the most likely diagnosis?

- 1- Alcoholic liver disease
- 2- Autoimmune hepatitis
- 3- Non-alcoholic steatohepatitis
- 4- Primary biliary cirrhosis
- 5- Viral hepatitis

Answer & Comments

Answer: 3- Non-alcoholic steatohepatitis

This is a case of non-alcoholic steatohepatitis, the diagnosis of which is made only by histology of liver biopsy which shows lesions suggestive of ethanol intake in a patient known to consume less than 40g of alcohol per week.

The diagnosis is supported by the presence of obesity, hyperglycaemia and hyperechogenic hepatic parenchyma.

In alcoholic hepatitis, the AST is normally raised more than the ALT typically with a ratio of at least 2:1.



[Q: 1914] OnExamination 2012 -
Gastroenterology

A 24-year-old man with chronic diarrhoea and malabsorption is suspected of having coeliac disease.

A jejunal biopsy is taken.

Which of the following findings would be expected in coeliac disease?

- 1- Appearances may resemble severe tropical sprue
- 2- Characteristically shows epithelial cells distended with fat globules
- 3- Shows fissures penetrating into the submucosa
- 4- Shows flattening of the crypts
- 5- Shows leaf-shaped villi

Answer & Comments

Answer: 1- Appearances may resemble severe tropical sprue

In coeliac disease the villi are shortened and the crypts lengthened with increased lymphocytic infiltrate.

Tropical sprue may also cause subtotal villous atrophy.

Fissures are not found and epithelial cells are normal.



[Q: 1915] OnExamination 2012 -
Gastroenterology

A 67-year-old man with known aortic valvular disease is admitted with deteriorating dyspnoea.

Investigations show:

Haemoglobin 9 g/dL (12-16)

MCV 70 fL (80-96)

Upper gastrointestinal tract endoscopy:
Normal

Duodenal biopsy: Normal

Which one of the following investigations is most likely to provide the diagnosis?

- 1- Barium enema
- 2- Colonoscopy
- 3- CT abdomen
- 4- Mesenteric angiography
- 5- Small bowel enema

Answer & Comments

Answer: 2- Colonoscopy

In the older age group investigation of the lower gastrointestinal (GI) tract is vital to exclude a lower GI malignancy. There is an association between aortic stenosis and angiodysplasia it has been debated and is likely to be present but weak. Angiodysplasia are more common in severe aortic disease and may regress upon treatment of the valvular lesion. There is evidence that angiodysplasia are more frequently present in patients with aortic stenosis as compared those with other valvular dysfunction and also that patients with aortic stenosis are over-represented in those with occult GI bleeding. This however does not extrapolate to mean that angiodysplasia is the most common underlying lesion in patients with aortic stenosis and GI bleeding.

Colonoscopy would have the greatest diagnostic yield in this setting. After this capsule endoscopy would probably be the most appropriate. Mesenteric angiography may be useful if there is active bleeding - generally a bleeding rate of at least 0.5mls/min is required to obtain a diagnostic scan, or a large arteriovenous malformation.

CT scans do not demonstrate colonic pathology as well as colonoscopy which is still considered the gold standard.



[Q: 1916] OnExamination 2012 -
Gastroenterology

A 22-year-old man returned from a back-packing holiday three weeks ago. While abroad he developed bloody diarrhoea with abdominal pain. Stool cultures have confirmed *Salmonella typhi*.

Which of the following antibiotics would be first line treatment?

- 1- Ampicillin
- 2- Ciprofloxacin
- 3- Erythromycin
- 4- Metronidazole
- 5- Tetracycline

Answer & Comments

Answer: 2- Ciprofloxacin

Ciprofloxacin is the antibiotic of choice for the treatment of *Salmonella* - 500 mg bd for 10-14 days.

Diarrhoea occurs due to increased water in the stool. The definition of chronic diarrhoea is the abnormal passage of three or more loose or liquid stools per day for more than four weeks and/or a daily stool volume > 200ml/day (weight > 200g/day).

Ampicillin or ciprofloxacin can be used for the treatment of *Shigella*.

Erythromycin is used in *Campylobacter jejuni*.

Metronidazole is used for *Clostridium difficile*.

Tetracycline is given for *Yersinia enterocolitica*.

Reference:

Bloom S, Webster G, Oxford Handbook of Gastroenterology and Hepatology, Oxford University Press 2006.

Travis SPL, Ahmad T, Collier J, Steinhart AH. *Pocket Consultant Gastroenterology*. Blackwell Publishing 2005.



[Q: 1917] OnExamination 2012 - Gastroenterology

A 25-year-old man who is known to have diabetes mellitus and suffers from recurrent chest infections is referred to the gastroenterology team with chronic diarrhoea.

The letter from his GP states the patient has had persistently abnormal liver function tests over the last three months and an abdominal ultrasound scan showed a fatty liver and gallstones.

Given the most likely diagnosis, what is the disease prevalence in northern Europe?

- 1- 1:300
- 2- 1:1000
- 3- 1:3000
- 4- 1:5000
- 5- 1:10000

Answer & Comments

Answer: 3- 1:3000

This patient has cystic fibrosis which has a disease prevalence of 1:3000 northern Europeans and gene carriage 1:25.5

Cystic fibrosis (CF) is an autosomal recessive disorder which results from mutations in the gene for the CFTR (cystic fibrosis transmembrane conductance regulator). This is a cAMP-activated chloride channel found in secretory epithelia.

Patients have dry protein-rich secretions which lead to complications of the pulmonary and gastrointestinal systems.

CF is the commonest cause of exocrine pancreatic insufficiency. The disease presents with failure to thrive, steatorrhoea and abdominal pain. Diabetes mellitus can occur.

Twenty per cent have a fatty liver and gallstones are seen in 15% of young adults with the disease. Patients may also develop secondary biliary cirrhosis with mucus plugging of bile ducts and portal hypertension.

Diagnosis is usually clinical based on the pulmonary and gastrointestinal manifestations, family history and a positive sweat test. Confirmation is with genetic studies.

Management requires a multi-disciplinary team approach with attention to nutrition. Vitamin deficiencies require replacement and pancreatic enzyme supplements are given for exocrine insufficiency.

There has been success with lung and liver transplantation; gene therapy remains the ultimate goal for treatment.

Reference:

Bloom S, Webster G, *Oxford Handbook of Gastroenterology and Hepatology*, Oxford University Press 2006.



[Q: 1918] OnExamination 2012 - Gastroenterology

Which of the following is a recognised cause of gingival hyperplasia?

- 1- Allopurinol
- 2- Hyoscine
- 3- Penicillamine
- 4- Phenytoin
- 5- Prednisolone

Answer & Comments

Answer: 4- Phenytoin

A rare adverse effect of allopurinol includes a metallic taste.

Hyoscine commonly causes a dry mouth.

Penicillamine can cause oral ulceration and loss of taste.

Prednisolone commonly results in Candida infection.

Reference:

Tofield C, Milson A, Chatu S. *The hands-on guide to clinical pharmacology*. Blackwell Publishing 2005.



[Q: 1919] OnExamination 2012 - Gastroenterology

A 42-year-old female with ulcerative colitis is found to have anti-smooth muscle antibodies.

Which is the next most appropriate test for this patient?

- 1- Abdominal ultrasound
- 2- Colonoscopy
- 3- Full blood count
- 4- Liver biopsy
- 5- Liver function tests

Answer & Comments

Answer: 5- Liver function tests

The most appropriate investigation for this woman is liver function tests (LFTs) to begin with to assess if there are any features of autoimmune hepatitis, that is,

Raised bilirubin

Aspartate aminotransferase (AST)

Alanine aminotransferase (ALT)

Alkaline phosphatase.

If this is the case then liver biopsy may be required or further diagnostic imaging.



[Q: 1920] OnExamination 2012 - Gastroenterology

A 70-year-old male is admitted with haematemesis.

He is currently being treated with warfarin for atrial fibrillation and his INR returns as 10 (<1.4).

Which of the following is the most appropriate immediate treatment of his INR?

- 1- Cryoprecipitate
- 2- Fresh frozen plasma
- 3- Intravenous vitamin K
- 4- Oral vitamin K
- 5- Recombinant factor VIII concentrate

Answer & Comments

Answer: 2- Fresh frozen plasma

This patient has had a bleed related to a grossly elevated international normalised ratio (INR). Consequently the INR needs correction as rapidly as is possible.

Vitamin K will correct the INR over a few days, whereas fresh frozen plasma will correct the bleeding time rapidly.



[Q: 1921] OnExamination 2012 - Gastroenterology

A 68-year-old male presents with alcoholic cirrhosis complicated by mild ascites.

Which of the following features is likely in this patient?

- 1- Increased serum sodium
- 2- Increased vascular resistance
- 3- Reduced renin concentrations
- 4- Reduced urinary potassium excretion
- 5- Reduced urinary sodium excretion

Answer & Comments

Answer: 5- Reduced urinary sodium excretion

Remember that he has secondary hyperaldosteronism which results in sodium retention with consequent potassium loss.

There is decreased vascular resistance, increased plasma volume and low serum sodium.



[Q: 1922] OnExamination 2012 -
Gastroenterology

A 35-year-old woman with a history of recurrent anaemia was noted to have target cells and Howell-Jolly bodies on a blood film examination.

Investigations revealed:

Haemoglobin 7.0 g/dL(11.5-16.5)

MCV 77 fL(80-96)

MCH 26.2 pg(28-32)

Serum B₁₂ 140 µg/L(160-760)

Red cell folate 95 µg/L(160-640)

Serum ferritin 10 µg/L(15-300)

What disease specific antibody is most likely to be present?

- 1- Antiendomysial
- 2- Antigastric parietal cell
- 3- Antiglutamic acid decarboxylase
- 4- Anti-intrinsic factor
- 5- Antimitochondrial

Answer & Comments

Answer: 1- Antiendomysial

The patient has hyposplenism as suggested by the blood film and a mixed anaemia.

Coeliac disease could therefore fit the above picture with antiendomysial antibodies being the most appropriate selection from the above list.

Antimitochondrial antibodies are seen in PBC

Anti-gastric and anti intrinsic Abs are seen in pernicious anaemia

Anti-GAD abs are found in auto-immune DM.

Screening for coeliac disease should include high-risk groups such as anaemia (iron or folate deficiency), hyposplenism, reduced bone density and infertility.



[Q: 1923] OnExamination 2012 -
Gastroenterology

A 63-year-old man with known alcohol related cirrhosis presented with ascites, abdominal tenderness and peripheral oedema. A diagnostic tap revealed a neutrophil count of 400/ mm³ (<250mm³).

Which of the following would be of most immediate benefit?

- 1- Fluid restriction and a no-added-salt diet
- 2- Intravenous antibiotics
- 3- Oral spironolactone
- 4- Therapeutic paracentesis
- 5- Transjugular intrahepatic portosystemic shunt (TIPSS)

Answer & Comments

Answer: 2- Intravenous antibiotics

This man has spontaneous bacterial peritonitis (SBP). Appropriate treatment is IV antibiotics.

He is likely to have a decreased intravascular volume and require IV albumin as volume expansion.

Fluid restriction, diuretics, or large volume paracentesis are likely to cause further hypovolaemia and precipitate renal failure.

There is no stated indication for a TIPSS, indications are: diuretic resistant ascites, intractable portal hypertensive bleeding and hepato-renal failure.



[Q: 1924] OnExamination 2012 -
Gastroenterology

Which of the following is not true of a patient with ascites due to liver cirrhosis?

- 1- Cardiac output is often elevated
- 2- Hepatic intrasinusoidal pressure is elevated
- 3- Spontaneous bacterial peritonitis is a recognised feature

- 4- The usual source of the ascitic fluid is mainly from the exudation from the surface of the liver
- 5- Urinary sodium concentration is usually less than 10 mmol/l

Answer & Comments

Answer: 4- The usual source of the ascitic fluid is mainly from the exudation from the surface of the liver

Hepatocellular failure is associated with hyperdynamic circulation and systemic vasodilatation with increased vascular capacitance.

Most patients have sodium and water retention.



[Q: 1925] OnExamination 2012 - Gastroenterology

Ten individuals are admitted to casualty with profuse vomiting after attending a retirement dinner in a Chinese restaurant.

They all ate at roughly 7 pm and became ill at roughly midnight. Nine ate a mixture of dishes except one female who ate vegetarian dishes with her rice.

What is the most likely infective organism?

- 1- Salmonella enteritidis
- 2- Staphylococcus aureus
- 3- E. Coli
- 4- Clostridium perfringens
- 5- Bacillus cereus

Answer & Comments

Answer: 5- Bacillus cereus

This is a typical case of Bacillus cereus, with profuse vomiting which occurs approximately one to five hours after eating.

In this case it is likely that the rice itself had been infected.

Another possibility is Staph. aureus although this is less likely.



[Q: 1926] OnExamination 2012 - Gastroenterology

A 55-year-old post-menopausal woman presents with tiredness and lethargy, she denies any other symptoms. Her blood tests show that she is anaemic.

Tests reveal:

Haemoglobin 10.3 g/dl 11.5-16.5

Mean corpuscular volume 76 fl 80 - 96

Ferritin 5 µg/l 15 - 300

Anti-tissue transglutaminase IgA antibodies are negative. Gastroscopy and CT colonography are both performed and do not reveal any cause for iron deficiency.

She is commenced on oral ferrous sulphate and three months later her haemoglobin is 11.5 g/dl. She comes to see you three months after this asking whether it is possible to stop the oral iron as she feels it is making her nauseous.

According to the British Society of Gastroenterology guidelines on the management of iron deficiency anaemia what is the most appropriate course of action?

- 1- Change to parenteral iron
- 2- Offer transfusion as required
- 3- Refer for further investigation
- 4- Stop oral iron and monitor haemoglobin
- 5- Trial of alternative oral iron preparation

Answer & Comments

Answer: 4- Stop oral iron and monitor haemoglobin

Parenteral iron replacement should be considered where iron replacement is necessary but oral preparation cannot be tolerated or absorbed.

There is no indication for transfusion and there has been a response to iron supplementation that is likely to be replicated, if necessary, in the future.

Initial investigations for a gastrointestinal cause for the iron deficiency have been completed and are negative, in the absence of other symptoms to suggest an alternative source for blood loss and in the presence of a good response to oral iron further investigation is not warranted.

Supplementary iron is no longer required at this stage in the patient's management so switching to an alternative is not required.

Alternative preparations and dose reduction may help where oral iron is not well tolerated.



[Q: 1927] OnExamination 2012 - Gastroenterology

Mutation of STK11/LKB1 gene is associated with which of the following diseases?

- 1- Familial adenomatous polyposis
- 2- Hereditary non-polyposis colorectal cancer
- 3- Neurofibromatosis
- 4- Peutz-Jeghers syndrome
- 5- Tuberous sclerosis

Answer & Comments

Answer: 4- Peutz-Jeghers syndrome

Mutation of APC gene leads to familial adenomatous polyposis.

Defective mismatch repair genes hMLH1 and hMSH2 leads to hereditary non-polyposis colorectal cancer.

Mutation of tumour suppressor genes NF1 (neurofibromin) and NF2 (merlin) results in neurofibromatosis type 1 and type 2, respectively.

In tuberous sclerosis there is mutation of TSC1 or TSC2 genes.

Reference:

Green AJ, Johnson PH, Yates JR. The tuberous sclerosis gene on chromosome 9q34 acts as a growth suppressor. *Hum Mol Genet.* 1994 Oct;3(10):1833-4.

Travis SPL, Ahmad T, Collier J, Steinhart AH. *Pocket Consultant Gastroenterology.* Blackwell Publishing 2005.

Yohay KH. The genetic and molecular pathogenesis of NF1 and NF2. *Semin Pediatr Neurol.* 2006;13:21-6.



[Q: 1928] OnExamination 2012 - Gastroenterology

Which of the following stimulates bicarbonate secretion from the pancreas and liver?

- 1- Cholecystikinin (CCK)
- 2- Gastrin
- 3- Motilin
- 4- Secretin
- 5- Vasoactive intestinal peptide (VIP)

Answer & Comments

Answer: 4- Secretin

Secretin is secreted from the small intestine when there is acid in the small intestine.

It inhibits gastric motility and acid production, and stimulates bicarbonate secretion from the pancreas and liver.



[Q: 1929] OnExamination 2012 - Gastroenterology

A 32-year-old female presents with pruritis and jaundice. She is 30 weeks gestation in her first pregnancy.

Two weeks earlier she had been treated by the ENT surgeons after presenting to the Emergency department with intractable nose bleeds.

The liver function tests are shown below:

ALT 72 U/L (5-40)

Alkaline phosphatase 700 U/L (30-110)

Bilirubin 80 $\mu\text{mol/L}$ (1-18)

Serum bile acids 100 times normal titre.

Which of the following statements is correct concerning this patient?

- 1- ALP does not increase in a normal pregnancy
- 2- Maternal hepatic blood flow does not increase in pregnancy
- 3- Treatment options include IV N-acetylcysteine
- 4- Varices are diagnostic of liver disease in pregnancy
- 5- Viral hepatitis is the likely diagnosis

Answer & Comments

Answer: 2- Maternal hepatic blood flow does not increase in pregnancy

The diagnosis here is intrahepatic cholestasis which presents with markedly elevated serum bile acids (cholyglycine).

It presents in the second or third trimester, and usually the alkaline phosphatase (ALP) is 7-10 times normal, with raised alanine transaminase (ALT), aspartate transaminase (AST) and bilirubin.

Cardiac output and blood volume increase in pregnancy, but hepatic blood flow does not.

Treatment options include ursodeoxycholic acid, cholestyramine, phenobarbital and vitamin K to treat the coagulopathy.

ALP rises in pregnancy but not to this extent. The placenta is the source of the raised ALP.

Viral hepatitis is the commonest cause of jaundice in pregnancy, but the elevated bile acids make this unlikely in this case.



[Q: 1930] OnExamination 2012 - Gastroenterology

A 25-year-old man who had a long history of heavy alcohol intake is admitted with nausea

and frequent vomiting four hours after a meal in a restaurant.

During review in the Emergency department he vomits a cupful of blood.

What is the cause of his haematemesis?

- 1- Duodenal ulceration
- 2- Haemorrhagic gastritis
- 3- Mallory-Weiss tear
- 4- Oesophageal varices
- 5- Oesophagitis

Answer & Comments

Answer: 3- Mallory-Weiss tear

Persistent vomiting can eventually lead to small tears in the oesophagus leading to the vomiting of red blood.

Varices would produce large volumes of blood (much more than just a cupful).



[Q: 1931] OnExamination 2012 - Gastroenterology

A male teacher who is 31-years-old attends clinic with his partner who tells you that he has memory problems. The only other symptom is intermittent diarrhoea over the preceding four months.

He has limited vertical eye movements and exhibits rhythmic simultaneous eye and mouth movements.

Which pathogen is most likely to be the cause of his symptoms?

- 1- Clostridium botulinum
- 2- HIV
- 3- Prion protein
- 4- Salmonella enteritidis
- 5- Tropheryma whippelii

Answer & Comments

Answer: 5- Tropheryma whippelii

This is a tough question.

The suggestion here is that the patient has Whipple's disease, due to intestinal infection with *Tropheryma whipplei*.

Non-neurological manifestations of Whipple's disease are more common and include chronic diarrhoea, malabsorption with steatorrhoea and associated abdominal distension and tenderness.

Neurological manifestations involve a chronic progressive impairment of higher mental function in association with seizures, myoclonus ataxia and oculomasticatory myorhythmia found uniquely in Whipple's.

The diagnosis is made by duodenal or jejunal biopsy and demonstrating the bacilli within the mucosa on PAS staining.

Characteristically, there is accumulation of glycoprotein and fat filled (PAS +ve) macrophage within the lamina propria.

Botulism does not produce this clinical picture.

An AIDS related dementia is possible, but abnormal facial movements would be unusual.

Creutzfeldt-Jakob disease (CJD) could also produce this picture, although myoclonus is usually more of a feature and cognitive impairment is more generalised and acute.

Salmonella enteritidis usually causes only an acute diarrhoeal illness, but may lead to bacteraemia and chronic long term carriage and excretion.



[Q: 1932] OnExamination 2012 - Gastroenterology

A routine ultrasound at 18 weeks' gestation in a diabetic mother reveals a male fetus with an endocardial cushion defect. Other abnormalities include increased nuchal thickening and a 'double bubble' sign.

Which of the following conditions is most likely to have contributed to this set of findings?

- 1- Congenital syphilis
- 2- Marfan syndrome
- 3- Maternal folate deficiency
- 4- Maternal use of ACE inhibitor
- 5- Trisomy 21

Answer & Comments

Answer: 5- Trisomy 21

Diabetic mothers are more likely to have children with congenital abnormalities depending on preconception and first trimester blood sugar control.

Forty per cent of Down's syndrome babies have atrioventricular septal defects, as in this fetus.

The double bubble sign suggests duodenal atresia, which again suggests Down's syndrome.

GI malformations occur in 6% of Down's patients - most commonly duodenal atresia and Hirschsprung's disease.



[Q: 1933] OnExamination 2012 - Gastroenterology

Which of the following statements is characteristic of acute hepatitis B infection?

- 1- It commonly presents with distal joint arthritis.
- 2- It confers immunity to hepatitis A.
- 3- Most patients present with splenomegaly.
- 4- Pruritis is an important early symptom.
- 5- There is increased infectivity in the presence of the hep B e antigen.

Answer & Comments

Answer: 5- There is increased infectivity in the presence of the hep B e antigen.

Clinical features of hepatitis B are as follows:

Most are asymptomatic.

Symptoms: Lethargy, anorexia, arthralgia, rash (any type), papular acrodermatitis (Gianotti-Crosti), polyarthrititis, glomerulonephritis, aplastic anaemia. Twenty five per cent have jaundice.

Complications:

Acute fulminant hepatitis.

Chronic hepatitis.

Membranous glomerulonephritis.

Hepatitis B e antigen is present in the acute phase and indicates a highly infectious state.

Pruritis is characteristic of chronic hepatitis.



[Q: 1934] OnExamination 2012 - Gastroenterology

A 35-year-old woman with alcoholic cirrhosis is admitted with deteriorating encephalopathy and abdominal discomfort.

An ascitic tap revealed a polymorphonuclear cell count of 350 cells per mm³.

Which of the following is the most appropriate therapy?

- 1- Intravenous amoxicillin
- 2- Intravenous cefotaxime
- 3- Intravenous metronidazole
- 4- Oral neomycin
- 5- Oral norfloxacin

Answer & Comments

Answer: 2- Intravenous cefotaxime

This lady has spontaneous bacterial peritonitis as suggested by the typical history, ascites and raised polymorphonuclear count within the ascitic tap.

It is most commonly seen in alcoholic cirrhosis and the causative organism is usually

Escherichia coli, Klebsiella, S pneumoniae or Enterococci. (Compare this with the mixed growth seen in other forms of peritonitis).

Sending some ascitic fluid in blood culture bottles increases the yield.

Initial treatment is with broad spectrum antibiotics such as cefotaxime.

Norfloxacin is recommended for short term prophylaxis.



[Q: 1935] OnExamination 2012 - Gastroenterology

A 54-year-old woman presented with an eighteen month history of chest pain and dysphagia for both solids and liquids. She smokes 20 cigarettes per day and drinks 16 units of alcohol per week.

Clinical examination was normal.

What is the most likely diagnosis?

- 1- Achalasia.
- 2- Bronchial neoplasm.
- 3- Oesophageal neoplasm.
- 4- Oesophageal web.
- 5- Pharyngeal pouch.

Answer & Comments

Answer: 1- Achalasia.

A longstanding history of dysphagia to both solids and liquids suggests a functional rather than mechanical cause for the dysphagia. Hence a neoplasm or other obstructive lesion is unlikely.

Chest pain is not a typical feature of a pharyngeal pouch.

Achalasia, in which there is failure of oesophageal peristalsis and of relaxation of the lower oesophageal sphincter, typically causes the symptoms described above.



[Q: 1936] OnExamination 2012 -
Gastroenterology

A 65-year-old woman presents with a one month history of jaundice.

She reports her urine is darker than normal and her stools are a pale colour. On direct questioning she admits to pruritis but denies abdominal pain. There is no history of foreign travel. She has lost approximately 1 stone in weight.

On examination she is jaundiced, there are no stigmata of chronic liver disease and no asterixis. Abdominal examination reveals hepatomegaly 4 cm below the costal margin.

Given the most likely diagnosis, which tumour marker is most likely to be elevated?

- 1- AFP
- 2- Beta-hCG
- 3- CA 19-9
- 4- CA 125
- 5- CEA

Answer & Comments

Answer: 3- CA 19-9

The most likely diagnosis in this case is pancreatic carcinoma. The most useful tumour marker for pancreatic cancer is CA 19-9, of which the sensitivity and specificity for pancreatic carcinoma are 80% and 90% respectively.

These figures are closely related to tumour size and the accuracy of using CA 19-9 to identify patients with small surgically resectable tumours is limited.

CA 19-9 does not distinguish between cholangiocarcinoma, pancreatic or gastric carcinoma and may also be raised in patients with severe liver injury due to any other cause.

Concentrations of alpha fetoprotein (AFP) and/or the beta subunit of human chorionic

gonadotrophin (beta-hCG) are raised in 80-85% of men who have non-seminomatous germ cell tumours. These markers (as well as lactate dehydrogenase [LDH]) are useful in prognosis, risk stratification and assessing response to treatment in testicular cancer.

The serum concentration of AFP is usually raised in patients with hepatocellular carcinoma (HCC). However the levels do not correlate well with other clinical features such as the size of the tumour, stage or prognosis of the disease. Levels greater than 500 microg/L (normal range 10-20 microg/L) in a high-risk patient is diagnostic of HCC.

AFP may also be elevated in patients with chronic liver disease without HCC for example, acute or chronic viral hepatitis.

Measurement of the CA 125 is the most widely studied biochemical method of screening for ovarian cancer. The level is raised in approximately 50% of women with early stage disease and in more than 80% of women who have advanced ovarian carcinoma.

Carcinoembryonic antigen (CEA) and CA 19-9 are associated with colorectal cancer (CRC), but they have low diagnostic ability to detect primary CRC in view of overlap with benign disease and low sensitivity for early stage disease.

Other causes of raised CEA include gastritis, peptic ulcer disease, diverticulitis, liver disease, COPD and diabetes mellitus as well as any acute or chronic inflammatory condition.

Reference:

Khan SA, Davidson BR, Goldin R, et al. Guidelines for the diagnosis and treatment of cholangiocarcinoma: consensus document. Gut 2002;51(Suppl VI):vi1-vi9.



[Q: 1937] OnExamination 2012 -
Gastroenterology

A 34-year-old man with ulcerative colitis is admitted with severe bloody diarrhoea. He is

opening his bowels approximately 15 times a day and has abdominal pain.

His current medication includes Mezavant and on admission he is commenced on intravenous hydrocortisone. You are asked to request a thiopurine methyltransferase (TPMT) level as the plan is to start azathioprine at a later date.

What percentage of the population has normal or high TPMT activity?

- 1- 1%
- 2- 10%
- 3- 25%
- 4- 50%
- 5- 90%

Answer & Comments

Answer: 5- 90%

Ninety per cent of the population have normal or high enzyme activity, that is, are homozygous for the wild-type allele.

The enzyme activity of thiopurine methyltransferase (TPMT) is under the control of a genetic polymorphism.

Ten per cent of the population have intermediate levels of TPMT activity, that is, one wild-type and one variant allele.

One in 300 people have no functional enzyme activity.

Several groups of patients - not only those with Inflammatory bowel disease - have developed azathioprine induced myelosuppression linked to TPMT deficiency.

Reference:

Mowat C, Cole A, Ahmad T, et al. Guidelines for the management of inflammatory bowel disease in adults. *Gut* 2004;53(Suppl V):v1-v16.



[Q: 1938] OnExamination 2012 - Gastroenterology

Which of the following is consistent with a diagnosis of insulinoma?

- 1- High fasting glucose, low insulin, high C peptide
- 2- Low fasting glucose, high insulin, high C peptide
- 3- Low fasting glucose, high insulin, low C peptide
- 4- Low fasting glucose, low insulin, high C peptide
- 5- Low fasting glucose, low insulin, low C peptide

Answer & Comments

Answer: 2- Low fasting glucose, high insulin, high C peptide

In contrast, insulin overdose will cause high insulin levels but a low C peptide.



[Q: 1939] OnExamination 2012 - Gastroenterology

Which of the following hormones stimulates contraction of the gallbladder?

- 1- Cholecystokinin
- 2- Gastrin
- 3- Secretin
- 4- Somatostatin
- 5- Vasoactive intestinal peptide (VIP)

Answer & Comments

Answer: 1- Cholecystokinin

Gastrin leads to the release of gastric acid.

Secretin stimulates the release of pancreatic fluid and bicarbonate.

Somatostatin inhibits gastrointestinal endocrine secretion.

Vasoactive intestinal peptide (VIP) functions as a vasodilator and also regulates smooth muscle activity, epithelial cell secretion and gastrointestinal blood flow.



[Q: 1940] OnExamination 2012 - Gastroenterology

Which of the following stimulates the secretion of gastrin?

- 1- Amino acids
- 2- Fasting
- 3- High level gastric acid in the stomach
- 4- Low gastric pH
- 5- Somatostatin

Answer & Comments

Answer: 1- Amino acids

Gastrin is released from specialised endocrine cells, called G cells, in response to a meal. Protein, peptides and amino acids are specific components which will stimulate gastrin release.

Fasting and increased gastric acid in the stomach both inhibit the release of gastrin. High gastric pH is a strong stimulus for the secretion of gastrin.

G cells are tightly regulated by two hormones - gastrin-releasing peptide has a stimulatory effect causing the secretion of gastrin, while somatostatin is inhibitory.



[Q: 1941] OnExamination 2012 - Gastroenterology

A 40-year-old woman with a history of Crohn's disease and multiple previous operations presents to the gastroenterology clinic.

She has begun suffering from increasing symptoms of early satiety, loss of appetite, bloating and diarrhoea over the past few months. She has lost weight, and is worried as

she finds it very difficult to maintain her weight anyway.

On examination her BMI is 18.5 kg/m². Physical examination is unremarkable apart from mild abdominal distension, and a number of old scars related to previous surgery.

Investigations show:

Haemoglobin 10.2 g/dl(11.5-16.5)

Mean corpuscular volume 104 fl(80-96)

White cell count 6.1 x 10⁹/L (4-11)

ESR 11 mm/hr(<10)

Platelets 175 x 10⁹/L (150-400)

Serum Sodium 136 mmol/l (135-146)

Serum Potassium 3.9 mmol/l (3.5-5)

Creatinine 90 µmol/l (79-118)

Serum albumin 32 g/l (35-50)

Hydrogen breath test Positive

Which of the following is the most likely diagnosis?

- 1- Bacterial overgrowth syndrome
- 2- Exacerbation of Crohn's disease
- 3- Functional diarrhoea
- 4- Pernicious anaemia
- 5- Short bowel syndrome

Answer & Comments

Answer: 1- Bacterial overgrowth syndrome

Symptoms of bloating, abdominal distension and diarrhoea are very consistent with a diagnosis of bacterial overgrowth syndrome. The hydrogen breath test further supports the diagnosis.

The fact that the ESR is normal significantly reduces the likelihood that this is an exacerbation of Crohn's.

The raised MCV is related to B12 deficiency, which is also caused by bacterial overgrowth.

Both metronidazole and tetracyclines are used in the management of the condition.



[Q: 1942] OnExamination 2012 - Gastroenterology

A 17-year-old man presents to the Emergency department complaining of intense pain on defecation, which persists for some hours after the event. The pain recurs with each bowel movement, and is so severe that he is now scared to defecate.

He is passing harder stools over the past few months and has noticed fresh blood on the paper and occasionally even drips of blood into the toilet.

From the history, which of the following is the most likely diagnosis?

- 1- Anal fissure
- 2- Crohn's disease
- 3- Irritable bowel syndrome
- 4- Rectal carcinoma
- 5- Ulcerative colitis

Answer & Comments

Answer: 1- Anal fissure

The history is of an anal fissure, which arises as a mucosal tear following passage of a hard stool. Most anal fissures occur in the posterior midline.

The majority of cases respond to conservative therapy which includes stool softeners and bulking agents.

Topical GTN treatment may also be useful for sphincter relaxation.

Surgery is reserved for resistant cases.



[Q: 1943] OnExamination 2012 - Gastroenterology

A patient is referred to the hepatology department for possible treatment of

hepatitis B.

He has stigmata of chronic liver disease. There is portal hypertension and ascites. His INR is 2.2 (<1.4) and albumin 25 g/L (37-49). HBsAg and HBeAg positive. Hepatitis C screen is negative.

What will you suggest for treatment?

- 1- Beta interferon
- 2- Tenofovir alone
- 3- Tenofovir plus interferon alpha
- 4- Ribavirin alone
- 5- Ribavirin plus interferon alpha

Answer & Comments

Answer: 2- Tenofovir alone

Beta interferon is used in the treatment of multiple sclerosis not hepatitis B.

Alpha interferon cannot be used in this case as it can initially worsen hepatic decompensation and increase the risk of sepsis in patients with cirrhosis.

Tenofovir alone is generally considered safe in decompensated hepatitis B virus (HBV) infection and should be able to produce a rapid reduction in the viral DNA load and may even produce recompensation of liver disease.

Ribavirin is used for hepatitis C infection. Its combination with interferon confers more success in treating HCV infection.



[Q: 1944] OnExamination 2012 - Gastroenterology

A 51-year-old man was brought to the Emergency department for loose stools.

He was dehydrated, weak and in shock. He had previously been complaining of large stool volumes for a one month period. Stool colour was normal. There was no history of laxative abuse and no significant past medical history.

What is the most likely diagnosis?

- 1- Carcinoid syndrome
- 2- Diabetic diarrhoea
- 3- Gastrinoma
- 4- Systemic mastocytosis
- 5- VIPoma

Answer & Comments

Answer: 5- VIPoma

VIPomas are endocrine tumours that secrete excessive amounts of VIP32 which causes a distinct syndrome characterised by large-volume watery diarrhoea, hypokalaemia, and dehydration.

This syndrome is also called Verner-Morrison syndrome, pancreatic cholera, or WDHA syndrome for watery diarrhoea, hypokalaemia, and achlorhydria, which some patients develop.

The mean age of patients is 49 years; however it can occur in children and when it does is usually caused by a ganglioneuroma or ganglioneuroblastoma.

A stool volume of less than 700 mL/d excludes the diagnosis of VIPoma.



[Q: 1945] OnExamination 2012 - Gastroenterology

A 50-year-old ex-footballer with a long history of alcohol excess presents with epigastric pain.

Which of the following suggests a diagnosis of peptic ulceration rather than chronic pancreatitis?

- 1- Back pain
- 2- Exacerbation with alcohol
- 3- Loose stool
- 4- Relieved by food
- 5- Weight loss

Answer & Comments

Answer: 4- Relieved by food

Relief with food suggests peptic (and specifically) duodenal ulceration. It is likely that food would precipitate the pain of chronic pancreatitis.

Loose stool is suggestive of pancreatitis/malabsorption. Pain referred to the back occurs in both situations and hence is not suggestive.

Weight loss can occur in both gastric ulcers and pancreatitis and is not very suggestive.

Alcohol may well exacerbate both types of pain.



[Q: 1946] OnExamination 2012 - Gastroenterology

A 30-year-old woman presents with jaundice and her investigations reveal:

Haemoglobin 9.0 g/dl(11.5-16.5)

Reticulocyte count $180 \times 10^9/L$ (25-85)

Serum bilirubin 50 $\mu\text{mol/l}$ (1-22)

Her blood film reveals the presence of spherocytes.

Which of the following is the next most useful investigation?

- 1- Abdominal ultrasound scan
- 2- Direct antiglobulin test
- 3- Glucose-6-phosphate dehydrogenase activity
- 4- Haemoglobin electrophoresis
- 5- Red cell osmotic fragility

Answer & Comments

Answer: 2- Direct antiglobulin test

The results given indicate a haemolytic anaemia of which spherocytes are typical and given the age of the patient the most likely cause is immune.

Therefore the most useful test is the direct antiglobulin test.



[Q: 1947] OnExamination 2012 - Gastroenterology

A 55-year-old female who had a long history of alcohol abuse presents with back pain and mild diarrhoea one month after having a pacemaker inserted.

On examination she had a fever of 39°C and her abdomen was soft and non-tender.

What is the most likely diagnosis?

- 1- Diverticulitis
- 2- Ischaemic colitis
- 3- Pancreatitis
- 4- Pseudomembranous colitis
- 5- Staphylococcal discitis

Answer & Comments

Answer: 5- Staphylococcal discitis

All patients with alcohol dependence have an increased risk of pancreatitis, but this is less likely without any abdominal signs.

Ischaemic colitis classically presents with bloody diarrhoea.

The prophylactic antibiotics given four weeks previously for her pacemaker insertion would not really have predisposed her to pseudomembranous colitis.

Staphylococci are skin organisms most commonly introduced during pacemaker insertion and such a discitis would present with back pain.



[Q: 1948] OnExamination 2012 - Gastroenterology

A 78-year-old female with diabetes presented with a two day history of melaena and dizziness. She had taken an unknown analgesic four days previously.

On examination she was pale with a pulse of 90 beats per minute, a blood pressure of 100/65 mmHg and a lower midline scar from an operation for intermittent claudication three months previously.

Investigations revealed:

Haemoglobin 8 g/dl(13.0-18.0)

Faecal occult blood Strongly positive

Upper gastrointestinal tract endoscopy Normal

What is the most likely cause of her upper gastrointestinal (GI) haemorrhage?

- 1- Aorto-enteric fistula
- 2- Gastric erosions
- 3- Gastric ulcer
- 4- Mallory-Weiss syndrome
- 5- Oesophageal varices

Answer & Comments

Answer: 1- Aorto-enteric fistula

The upper GI endoscopy is normal, therefore GU, gastric erosions, varices and Mallory-Weiss syndrome are unlikely.

The strongly positive faecal occult blood (FOB) suggests significant GI haemorrhage.

Aorto-enteric fistulae (AEF) are now known to occur following endovascular repair of abdominal aortic aneurysms (AAA), and secondary to aortic grafting of any kind, presumably because of mechanical forces of dislodged or migrating devices.

This patient may well have had an aorto-bifemoral graft, as treatment for peripheral vascular disease.



[Q: 1949] OnExamination 2012 - Gastroenterology

A 29-year-old male presents with symptoms of severe gastro-oesophageal reflux.

Which one of the following is most useful in assessing the role of surgery?

- 1- Cardiac sphincter manometry
- 2- Gastric emptying study
- 3- Intra-gastric pH monitoring of therapy
- 4- Oesophageal motility study
- 5- Oesophageal pH monitoring of therapy

Answer & Comments

Answer: 4- Oesophageal motility study

Laparoscopic fundoplication is the treatment of choice for patients with gastro-oesophageal reflux disease (GORD) refractory to or intolerant of, proton pump inhibitor therapy.

The patient should have had an endoscopy at least six months prior to surgery to exclude any unsuspected pathology - Barrett's oesophagus or adenocarcinoma.

An oesophageal transit study is indicated to rule out a primary motor disorder (for example, achalasia, scleroderma) when suspected and to rule out aperistalsis, which may result in post-operative dysphagia after some forms of fundoplication.



[Q: 1950] OnExamination 2012 - Gastroenterology

Which one statement is true regarding the treatment of iron deficiency anaemia?

- 1- Iron is absorbed in the distal jejunum
- 2- Absorption of iron is increased by ascorbic acid
- 3- Sustained release iron is a useful way of giving larger doses
- 4- Ferrous sulphate 200 mg has less elemental iron than the same dose of ferrous gluconate
- 5- Parenteral iron is indicated when the anaemia responds slowly to oral iron

Answer & Comments

Answer: 2- Absorption of iron is increased by ascorbic acid

- A. Iron is absorbed in the upper small intestine.
- B. Absorption of oral iron is improved by ascorbic acid.
- C. Sustained release preparations may improve tolerance of oral iron but do not aid absorption.
- D. Ferrous sulphate has more elemental iron by mass.
- E. Parenteral iron acts no faster than oral iron. It is indicated when oral iron cannot be tolerated or is not absorbed.



[Q: 1951] OnExamination 2012 - Gastroenterology

A 24-year-old man with chronic diarrhoea and malabsorption is suspected of having coeliac disease.

A jejunal biopsy is taken.

Which of the following findings would be expected in coeliac disease?

- 1- Appearances may resemble severe tropical sprue
- 2- Characteristically shows epithelial cells distended with fat globules
- 3- Shows fissures penetrating into the submucosa
- 4- Shows flattening of the crypts
- 5- Shows leaf-shaped villi

Answer & Comments

Answer: 1- Appearances may resemble severe tropical sprue

In coeliac disease the villi are shortened and the crypts lengthened with increased lymphocytic infiltrate.

Tropical sprue may also cause subtotal villous atrophy.

Fissures are not found and epithelial cells are normal.



[Q: 1952] OnExamination 2012 - Gastroenterology

Which of the following is activated by cholera toxin?

- 1- Adenylate cyclase
- 2- Guanylate cyclase
- 3- Peroxisome proliferator receptor (PPAR) gamma
- 4- Sodium/potassium ATPase
- 5- The glucose-sodium transporter

Answer & Comments

Answer: 1- Adenylate cyclase

Cholera toxin activates adenylate cyclase with generation of cyclic adenosine monophosphate (cAMP).



[Q: 1953] OnExamination 2012 - Gastroenterology

Which of the following concerning the conjugation of bilirubin is correct?

- 1- It is catalysed by a glucuronyl transferase
- 2- It occurs in the Kupfer cells of the liver
- 3- It is increased by valproate
- 4- It is inhibited by rifampicin
- 5- It is impaired in Dubin-Johnson syndrome

Answer & Comments

Answer: 1- It is catalysed by a glucuronyl transferase

- B. Bilirubin is conjugated in the hepatocytes.
- C. Sodium valproate is an enzyme inhibitor.
- D. Rifampicin is an enzyme inducer.

E. In Dubin-Johnson syndrome conjugation is normal, but excretion from the hepatocyte into the bile is impaired, resulting in a conjugated bilirubinaemia.

(In Gilbert's syndrome, bilirubin cannot enter the hepatocyte and unconjugated bilirubinaemia occurs, as it does in Crigler-Najjar syndrome, where bilirubin does not conjugate due to malproduced bilirubin glucuronyl transeferase.)



[Q: 1954] OnExamination 2012 - Gastroenterology

A 46-year-old man with a family history of haemochromatosis presented to outpatients for advice.

Investigations revealed.

Serum ferritin 453 g/L (15-300)

Serum iron 29 mol/L (12-30)

Serum iron binding capacity 46 mol/L (45-75)

Iron saturation 63 per cent (20-50)

What is the most appropriate next step in management?

- 1- Arrange for DNA analysis
- 2- Begin a venesection programme
- 3- Monitor his serum ferritin regularly
- 4- Take no action unless the iron saturation exceeds 90 per cent
- 5- Undertake a liver biopsy

Answer & Comments

Answer: 1- Arrange for DNA analysis

This man is likely to have hereditary haemochromatosis (HHC).

Homozygous mutation (C282Y mutation) of the human iron gene (HFE gene) accounts for over 80% of cases of HHC.

The diagnosis is made on DNA analysis.

If the diagnosis is confirmed then treatment with venesection to achieve and maintain a ferritin of 50-100µg/l is indicated.

A liver biopsy is not required to make the diagnosis of HHC although may be indicated for prognostic reasons if cirrhosis is suspected.



[Q: 1955] OnExamination 2012 - Gastroenterology

A 75-year-old woman is admitted with headache and vomiting. She denies abdominal pain. She reports weight loss of one stone over the last six weeks.

On further questioning it becomes apparent that she has noticed the vomitus contains food from several days ago. Abdominal x ray reveals a prominent gastric bubble.

Which of the following is the most likely diagnosis?

- 1- Acute cholecystitis
- 2- Colon carcinoma
- 3- Gastric outflow obstruction
- 4- Peptic ulceration
- 5- Raised intracranial pressure

Answer & Comments

Answer: 3- Gastric outflow obstruction

Vomiting of food from several meals ago suggests gastric stasis or gastric outflow obstruction. In this case, with the history of weight loss, an underlying malignancy such as antral gastric carcinoma is likely.

Patients with acute cholecystitis typically have abdominal pain, usually in the right upper quadrant or epigastrium. Nausea and vomiting may also occur. Patients are often febrile.

Abdominal pain and change in bowel habit are the common clinical presentations of colorectal cancer.

Upper abdominal pain or discomfort is the most prominent symptom in patients with

peptic ulcer disease; occasionally there may be vomiting.

Clinical features of raised intracranial pressure include headache, reduced consciousness and vomiting. Signs include sixth cranial nerve palsy and papilloedema. Hypertension and bradycardia (Cushing's reflex) may also be seen.

Reference:

Firth JD, Keshav SC, Atkinson RJ, Hirschfield GM, Leeds JS, Medical Masterclass Gastroenterology and Hepatology, Royal College of Physicians of London 2008.



[Q: 1956] OnExamination 2012 - Gastroenterology

You are asked to review the blood results of an 18-year-old woman who is known to have anorexia nervosa. She is under close review by the dietician who has asked you to ensure electrolytes are checked daily.

Which of the following is a feature of the potentially life-threatening complication this lady is at risk of developing?

- 1- Hypercalcaemia
- 2- Hyperkalaemia
- 3- Hypermagnesaemia
- 4- Hyperphosphataemia
- 5- Hypophosphataemia

Answer & Comments

Answer: 5- Hypophosphataemia

There are potentially fatal complications which can result from refeeding patients who have had periods of starvation, including those with anorexia nervosa. Hypophosphataemia is a key feature of refeeding syndrome.

Refeeding syndrome is defined as the clinical complications which arise as a consequence of fluid and electrolyte shifts during the nutritional support of malnourished patients.

Refeeding syndrome comprises

Hypophosphataemia

Hypokalaemia

Hypomagnesaemia

Deficiencies in vitamins, for example, thiamine and trace minerals and

Fluid overload with oedema.

The fluid retention may contribute to cardiac failure.



[Q: 1957] OnExamination 2012 - Gastroenterology

A 17-year-old man presents to the clinic with intermittent severe pain passing a motion, accompanied by bright red rectal bleeding. The pain often lasts for hours afterwards and he is afraid of going to the toilet.

He says he does not like eating fruit and vegetables and that his motion is usually very hard and he only passes faeces every two to three days. He has not lost any weight and otherwise feels well, holding down a job in a computer shop whilst doing his A levels.

His BP is 122/72mmHg, pulse is 72, general physical examination is normal.

Investigations show

Hb 13.1 g/dl(13.5-18)

WCC $6.2 \times 10^9/L$ (4-10)

PLT $203 \times 10^9/L$ (150-400)

Na 138 mmol/l (134-143)

K 4.4 mmol/l (3.5-5)

Cr 102 $\mu\text{mol/l}$ (60-120)

Given these findings, which of the following is the most likely diagnosis?

1- Anal fissure

2- Anal fistula

3- Irritable bowel syndrome

4- Piles

5- Ulcerative colitis

Answer & Comments

Answer: 1- Anal fissure

Paroxysms of pain, accompanied by episodes of bleeding are typical of anal fissure. The initiating factor for formation of an anal fissure is thought to be passage of a particularly hard motion which leads to trauma.

In most people acute tears in the anal mucosa heal spontaneously but in some they lead to a chronic anal fissure.

Stool softeners are the mainstay of therapy, with surgery reserved for those who fail medical intervention.



[Q: 1958] OnExamination 2012 - Gastroenterology

A 35-year-old woman comes to the clinic for review. She has been suffering from abdominal bloating, very strongly smelling bowel gas and intermittent diarrhoea over the past two months since returning from honeymoon in Africa.

On examination her BP is 125/82 mmHg, and her temperature is 37.2°C. Her BMI is 23 kg/m², and her abdomen is mildly distended.

Investigations show

Hb 11.1 g/dl(13.5-18)

WCC $8.1 \times 10^9/L$ (4-10)

PLT $271 \times 10^9/L$ (150-400)

Na 139 mmol/l (134-143)

K 4.6 mmol/l (3.5-5)

Cr 104 $\mu\text{mol/l}$ (60-120)

Stool sample: Trophozoites in the fresh stool sample.

Which of the following is the most likely diagnosis?

1- Giardiasis

- 2- Schistosomiasis
- 3- Shigellosis
- 4- Tropical sprue
- 5- Whipple's disease

Answer & Comments

Answer: 1- Giardiasis

The history of abdominal bloating with intermittent diarrhoea and strong smelling bowel gas is typical of giardiasis. As long as a fresh stool sample is examined, trophozoites are found in 60%+ of samples.

A single dose of tinidazole or a course of metronidazole is the treatment of choice.

Adequate sanitation is the key to reducing the risk of infection, although the infection rate from uncooked foods is high in areas where Giardia is endemic.



[Q: 1959] OnExamination 2012 - Gastroenterology

A 72-year-old man is discharged from hospital following a stroke.

During his stay he was started on several new medications. He presents with diarrhoea.

Which of the following medications is most likely to be the cause?

- 1- Clopidogrel
- 2- Enalapril
- 3- Metformin
- 4- Pioglitazone
- 5- Simvastatin

Answer & Comments

Answer: 3- Metformin

Although all the medications listed could cause gastrointestinal disturbances it is metformin that is by far the most likely.



[Q: 1960] OnExamination 2012 - Gastroenterology

Which one of the following require urgent referral for upper endoscopy?

- 1- A 35-year-old male who has a history of waterbrash and dyspepsia which has responded to a course of ranitidine but since stopping has recurred
- 2- A 45-year-old male with a one month history of persistent dyspepsia
- 3- A 56-year-old male with a one month history of dyspepsia and a pulsatile central abdominal mass
- 4- A 62-year-old male with a three month history of unexplained weight loss, tenesmus and a right abdominal mass
- 5- A 73-year-old male with a three month history of dyspepsia which has failed to respond to a course of proton pump inhibitors

Answer & Comments

Answer: 5- A 73-year-old male with a three month history of dyspepsia which has failed to respond to a course of proton pump inhibitors

Criteria for referral for urgent endoscopy include

Dysphagia (at any age)

Dyspepsia at any age combined with any one of weight loss, anaemia or vomiting

Dyspepsia in a patient aged 55 or above with onset of dyspepsia within one year and persistent symptoms

Dyspepsia with one of Barrett's oesophagus, familial hypercholesterolaemia (FH) of upper gastrointestinal (GI) carcinoma, pernicious anaemia or upper GI surgery more than 20 years ago

Jaundice

Abdominal mass.

With regard to the presented cases, the 56-year-old man has dyspepsia with what seems to be an aortic aneurysm. This requires an ultrasound and vascular opinion.

In the case of unexplained weight loss, tenesmus and upper right mass the problem is likely to be a colonic carcinoma.



[Q: 1961] OnExamination 2012 - Gastroenterology

A 75-year-old patient presents with watery diarrhoea.

He is passing large volumes of watery diarrhoea, approximately 3 litres a day, with no noticeable blood. It has been present for approximately five months and is gradually becoming more frequent. It often wakes him at night with the urge to defecate.

Liver function tests, calcium and urea and electrolytes are normal. Stool microscopy and culture are normal, and Clostridium difficile toxin is negative.

A flexible sigmoidoscopy is organised, and the investigator reports to you that the large bowel appears normal.

From which of the following treatments may this patient benefit?

- 1- Gluten free diet
- 2- High fibre diet
- 3- Low residue diet
- 4- Oral cholestyramine
- 5- Oral prednisolone

Answer & Comments

Answer: 4- Oral cholestyramine

In the absence of infection and with this typical history in an elderly individual the diagnosis is likely to be microscopic colitis.

This does not fulfil the ROME II criteria for irritable bowel syndrome (IBS).

Although coeliac disease is a possibility, this is unlikely, given the patient's age, and the presentation.

Microscopic colitis can only be diagnosed by colonoscopy and mucosal biopsy because, macroscopically, the colon appears normal. The incidence is increasing as the use of colonoscopy increases - almost certainly due to better diagnostic workup.

Microscopic colitis is diagnosed in up to 10% of all patients undergoing colonoscopy for unexplained diarrhoea, an incidence which increases to 20% in those aged over 70 years.

Microscopic colitis may be associated with bile acid malabsorption and may respond to either budesonide or cholestyramine.



[Q: 1962] OnExamination 2012 - Gastroenterology

A 50-year-old male with a history of alcohol dependence syndrome presents with a two week history of confusion.

Which of the following strongly suggests a diagnosis of Korsakoff's psychosis?

- 1- Delusional jealous beliefs
- 2- Epileptic seizures
- 3- Impaired long term memory
- 4- Inventing recent events
- 5- Visual hallucinations

Answer & Comments

Answer: 4- Inventing recent events

Korsakoff's is associated with short term memory loss with subsequent compensatory confabulation by the patient.

Other symptoms may include:

Delirium

Anxiety

Fear

Depression

Confusion

Delusions

Insomnia.

Painful extremities, sometimes bilateral wrist drop but more frequently bilateral foot drop with pain or pressure over the long nerves are also symptoms.

The treatment is intravenous thiamine and attention to the consequences of alcohol withdrawal.



[Q: 1963] OnExamination 2012 - Gastroenterology

A 55-year-old male is admitted with vomiting.

He has a long history of alcohol abuse, appears slightly jaundiced and is dishevelled and unkempt. He was started on an intravenous glucose infusion and diazepam and he symptomatically improved.

One day later he becomes confused, develops vomiting, diplopia and is unable to stand.

What is the most likely diagnosis?

- 1- Benzodiazepine intoxication
- 2- Delirium tremens
- 3- Hepatic encephalopathy
- 4- Subdural haematoma
- 5- Vitamin B deficiency

Answer & Comments

Answer: 5- Vitamin B deficiency

This patient is manifesting signs of Wernicke's encephalopathy with confusion, oculomotor signs and ataxia affecting gait and stance. Wernicke's encephalopathy is a medical emergency, requiring urgent intravenous thiamine.

The episode has been precipitated by intravenous dextrose administration which

has exhausted his vitamin B reserves, hence B vitamins must be administered to all alcoholic patients requiring dextrose.



[Q: 1964] OnExamination 2012 - Gastroenterology

A 67-year-old man with known aortic valvular disease is admitted with deteriorating dyspnoea.

Investigations show:

Haemoglobin 9 g/dL (12-16)

MCV 70 fL (80-96)

Upper gastrointestinal tract endoscopy: Normal

Duodenal biopsy: Normal

Which one of the following investigations is most likely to provide the diagnosis?

- 1- Barium enema
- 2- Colonoscopy
- 3- CT abdomen
- 4- Mesenteric angiography
- 5- Small bowel enema

Answer & Comments

Answer: 2- Colonoscopy

In the older age group investigation of the lower gastrointestinal (GI) tract is vital to exclude a lower GI malignancy.

CT scans do not demonstrate colonic pathology as well as colonoscopy which is still considered the gold standard.

Angiography is only helpful if the patient is bleeding briskly at the time of the examination.



[Q: 1965] OnExamination 2012 - Gastroenterology

A 24-year-old woman who has a long history of ulcerative colitis and takes mesalazine 3 g

per day discovers that she is 10 weeks pregnant.

She is also a smoker of 15 cigarettes daily. She now presents with a deterioration of symptoms with six bloody stools per day.

Which one of the following statements is correct?

- 1- Azathioprine would be contraindicated
- 2- Initiating an elemental diet predisposes to fetal malnutrition
- 3- Mesalazine therapy should be withdrawn
- 4- Steroid therapy is contraindicated
- 5- Termination of the pregnancy is advised

Answer & Comments

Answer: 1- Azathioprine would be contraindicated

Azathioprine should not generally be started in pregnancy.

Well controlled ulcerative colitis is more important for the baby from a nutritional point of view.

An elemental diet simply contains pre-digested food and would not lead to fetal malnutrition.

The safety of the 5-aminosalicylic acid (5-ASA) drugs in pregnancy is best supported by the data on Salazopyrin which have been available for the longest.



[Q: 1966] OnExamination 2012 - Gastroenterology

A 22-year-old man presented to the casualty department one week after returning from a six month visit to Pakistan.

He complained of fever, rigors and headache.

On examination he was febrile (38°C) with a blood pressure of 115/65 mmHg, and a pulse of 100/minute. His abdomen was tender in the right upper quadrant.

Investigations showed:

Hb 11.0 g/dL (13.0-18.0)

WBC $15.5 \times 10^9/L$ (4-11 $\times 10^9$)

Neutrophils $13.5 \times 10^9/L$ (1.5-7 $\times 10^9$)

Platelets $350 \times 10^9/L$ (150-400 $\times 10^9$)

Blood film No malaria parasites seen

Alk Phos 450 U/L (45-105)

AST 50 U/L (1-31)

CRP 88 mg/L (<10)

Stool culture Negative

Chest x ray: Small right pleural effusion noted

Which of the following investigations would be of most diagnostic value?

- 1- Hepatitis E serology
- 2- Sigmoidoscopy
- 3- Stool microscopy for ova, cysts and parasites
- 4- Typhoid serology
- 5- Ultrasound scan of the abdomen

Answer & Comments

Answer: 5- Ultrasound scan of the abdomen

The presentation is not consistent with hepatitis E infection.

Typhoid serology is unreliable.

The differential diagnosis is mainly pyogenic or amoebic liver abscess.

Pyogenic abscesses present with:

Swinging pyrexia

Neutrophilia and

High inflammatory markers.

Right-sided pleural effusions are common and blood cultures are often positive.

The presentation of amoebic liver abscess (ALA) is very similar. Most patients do not have bowel symptoms at any time and

amoebic cysts are found in stool in less than 50% of proven cases of ALA.

Serology is the mainstay of diagnosis.

Ultrasound scan would confirm most moderate-sized to large liver abscesses and could guide a diagnostic aspiration.

Small lesions are best demonstrated by computerised tomography (CT) or magnetic resonance imaging (MRI).



[Q: 1967] OnExamination 2012 - Gastroenterology

A 60-year-old woman with known alcoholic liver cirrhosis presents with vague abdominal pains, malaise and nausea.

She has been abstinent since she was diagnosed eight months ago.

On examination she had moderate ascites and mild, generalised abdominal tenderness.

Investigations show:

Haemoglobin 11.2 g/dL (11.5-16.5)

WCC $15 \times 10^9/L$ ($4-11 \times 10^9$)

Prothrombin time 21 secs (11.5-15.5)

Serum Albumin 28 g/L (37-49)

Serum total bilirubin 56 $\mu\text{mol/L}$ (1-22)

Ascitic fluid protein 26 g/L

Ascitic fluid amylase Normal

Ascitic fluid white cell count $500 \times 10^9/L$

What is the most likely reason for her current problem?

- 1- Hepatic vein thrombosis
- 2- Pancreatic pseudocyst rupture
- 3- Portal vein thrombosis (PVT)
- 4- Primary liver cancer
- 5- Spontaneous bacterial peritonitis

Answer & Comments

Answer: 5- Spontaneous bacterial peritonitis

The high white cell count in the ascites makes spontaneous bacterial peritonitis (SBP) much more likely than Budd-Chiari syndrome (BCS), PVT, hepatocellular carcinoma (HCC), or a ruptured pancreatic pseudocyst.

Abdominal pain is often only mild, or even absent in SBP, with patients often presenting with otherwise unexplained hepatic decompensation.



[Q: 1968] OnExamination 2012 - Gastroenterology

Which of the following is true concerning a hepatitis E infection?

- 1- CT scan of the liver with contrast shows diagnostic appearances.
- 2- It can be transmitted with hepatitis B.
- 3- It does not result in a carrier state.
- 4- It is a recognised cause of chronic liver disease.
- 5- The incidence of chronic liver disease is reduced by administration of alpha interferon.

Answer & Comments

Answer: 3- It does not result in a carrier state.

Five hepatitis viruses form a heterogeneous group causing similar clinical illnesses.

Hepatitis A, C, D, and E are all ribonucleic acid (RNA) viruses coming from four different families; and hepatitis B is a deoxyribonucleic acid (DNA) virus.

Hepatitis A and E cause acute illness, with the former causing most hepatitis in childhood and hepatitis E being very rare.

Hepatitis B, C, and D cause chronic morbidity and mortality, with B causing a third of cases, hepatitis C a fifth of cases, and D being very rare.

Hepatitis D illness cannot occur without B as a helper virus.

Hepatitis B can be treated with interferon-alpha, which improves liver disease.



[Q: 1969] OnExamination 2012 - Gastroenterology

Which of the following statements regarding colon cancer is correct?

- 1- In non-familial cases gene mutations in the cancer cells are unusual
- 2- In familial cases the inheritance pattern is typically autosomal recessive
- 3- It occurs most commonly in the ascending colon
- 4- It is a characteristic feature of the Peutz-Jegher syndrome
- 5- In familial polyposis coli the increased cancer risk is due to inheritance of a mutated suppressor gene

Answer & Comments

Answer: 5- In familial polyposis coli the increased cancer risk is due to inheritance of a mutated suppressor gene

A. Quantitative and qualitative alterations in gene expression accumulate in colorectal cancer cells. These include alterations of proto-oncogene expression and chromosomal abnormalities (deletions at 17p and 18q are seen in 70% of colorectal carcinomas).

B. Both familial polyposis coli and Gardner's syndrome are autosomal dominant.

C. The rectum and sigmoid colon are the commonest sites.

D. Peutz-Jegher's syndrome is dominantly inherited pigmentation of skin and mucous membranes and hamartomatous polyps in the stomach and larger intestine. The polyps only rarely undergo malignant change.

E. An allelic deletion of a putative tumour suppressor gene located 5q21-q22. Familial adenomatous polyposis (FAP) is an autosomal

dominant disorder causing extensive adenomatous polyps of the colon and early onset colorectal cancer.



[Q: 1970] OnExamination 2012 - Gastroenterology

Which of the following statements is correct of hepatitis C virus infection?

- 1- Cell cultures of virus are routinely used to assess response to drug therapy
- 2- High antibody titres are an indication for therapy
- 3- Less than 5% of cases lead to chronic infection
- 4- Treatment with ribavirin and interferon alpha is more effective than interferon alpha alone
- 5- More likely to be transmitted by the sexual route than hepatitis B virus

Answer & Comments

Answer: 4- Treatment with ribavirin and interferon alpha is more effective than interferon alpha alone

In hepatitis C infection, the criteria for treatment are:

Abnormal liver function tests and

Detectable hepatitis C ribonucleic acid (RNA) in plasma with

Evidence of moderate inflammation on liver biopsy.

Response to therapy is determined by normalisation of hepatic transaminases and undetectability of hepatitis C RNA in plasma.

Hepatitis C is generally transmitted by inoculation or vertically from mother-to-child.

In contrast to hepatitis B, sexual transmission is uncommon.

Around 85% of acute hepatitis C infections lead to chronic infection.

Treatment with interferon alpha alone has around a 10-15% success rate in achieving long term undetectability of plasma hepatitis C RNA.

Combination treatment with ribavirin and interferon alpha has been found to have approximately a 45% success rate.



[Q: 1971] OnExamination 2012 - Gastroenterology

A 45-year-old woman is diagnosed with a duodenal ulcer.

Which one of the following is the most sensitive test for detecting current infection with Helicobacter pylori?

- 1- Culture of a gastric biopsy
- 2- Gastric fundal biopsy
- 3- Presence of Helicobacter pylori serum antibodies
- 4- The (13C) urea breath test
- 5- Urease test on gastric biopsy

Answer & Comments

Answer: 4- The (13C) urea breath test

The gold standard for diagnosis of H. pylori remains culture of a gastric biopsy. Yet this test is only 72% sensitive.

The rapid urease test on a biopsy is 80-95% sensitive and 95-100% specific. Histology is 80-90% sensitive and 95% specific.

The urease breath test is approximately 95% sensitive and 98-100% specific. Therefore the most specific and clinically applicable would be the urease breath test.

The presence of IgG antibodies to H. pylori could indicate previous infection.

A gastric antral biopsy can give false negative results following proton pump inhibitor (PPI) treatment.



[Q: 1972] OnExamination 2012 - Gastroenterology

A 29-year-old man presents with anaemia, bleeding tendency, diarrhoea and abdominal pain.

Examination reveals a palpable mass in the right lower quadrant and anal skin tags.

What is the most likely underlying condition?

- 1- Chronic pancreatitis
- 2- Coeliac disease
- 3- Crohn's disease
- 4- Intestinal lymphoma
- 5- Ulcerative colitis

Answer & Comments

Answer: 3- Crohn's disease

Crohn's disease commonly presents with diarrhoea, abdominal pain and weight loss. It can affect the whole gastrointestinal tract, the commonest being ileocolitis.

Anaemia is usually due to blood loss and less commonly B12/folate malabsorption.

An abdominal mass is often palpable in the presence of small bowel disease, which can lead to vitamin K malabsorption.

Anal tags, fissures, perianal fistulae and abscesses are associated with Crohn's disease and not ulcerative colitis.



[Q: 1973] OnExamination 2012 - Gastroenterology

A 43-year-old male presents with weight loss and watery diarrhoea.

Investigations reveal hypokalaemia with a pancreatic mass.

Which of the following would support the diagnosis of a VIPoma?

- 1- Achlorhydria
- 2- Hypoglycaemia
- 3- Increased pancreatic polypeptide
- 4- Migratory erythema
- 5- Pellagra

Answer & Comments

Answer: 1- Achlorhydria

Achlorhydria is classically associated with VIPoma together with profuse diarrhoea, a hypokalaemic acidosis and hyperglycaemia.

Migratory erythema is associated with a glucagonoma.

Although raised pancreatic polypeptide is seen with a VIPoma it is unusual and is more commonly associated with its own syndrome.

Pellagra is associated with the carcinoid syndrome.



[Q: 1974] OnExamination 2012 - Gastroenterology

Which of the following is correct regarding reflux of gastric contents into the oesophagus?

- 1- Can be excluded by a normal appearance at endoscopy
- 2- Can be improved by Helicobacter pylori eradication
- 3- Is a cause of asthma
- 4- Is neutralised by bicarbonate secreted by the oesophageal mucosa
- 5- Occurs during transient relaxation of the lower oesophageal sphincter

Answer & Comments

Answer: 5- Occurs during transient relaxation of the lower oesophageal sphincter

Diagnosis is based predominantly on history, with a proportion of patients with reflux disease having a normal endoscopy.

H. pylori eradication is indicated in long term healing of gastric and duodenal ulceration, but not reflux disease.

Whilst it is true the oesophagus secretes bicarbonate, the statement here is not true. It is a fairly weak defence, and is not able to neutralise any gastric contents which reflux up the oesophagus. More effective Brunner's glands which secrete alkaline mucus are found in the duodenum.

The link between asthma and gastro-oesophageal reflux disease is a complex one, but a recent systemic review indicates that there is a significant association but there is a lack of data on the direction of causality. It is therefore not possible to conclude that GORD is a cause of asthma.



[Q: 1975] OnExamination 2012 - Gastroenterology

A 55-year-old man is admitted with frank haematemesis.

The patient is a poor historian but a recent discharge summary reports he was under the gastroenterology team two months previously with decompensated alcoholic liver disease.

On examination he appears anxious; he is tachycardic at 105 beats per minute with a blood pressure of 122/90 mmHg. There is evidence of palmar erythema and spider naevi. Abdominal examination reveals hepatosplenomegaly and mild ascites.

There is no evidence of melaena on rectal examination. He has a further episode of haematemesis while in the Emergency department which the nursing staff estimates at approximately 500 ml.

Which class of hypovolaemic shock is applicable to this patient's clinical state?

- 1- Class I

- 2- Class II
- 3- Class III
- 4- Class IV
- 5- Class V

Answer & Comments

Answer: 2- Class II

Class II of hypovolaemic shock by blood loss in adults is where there is 750-1500 ml blood loss with 15-30% loss of circulating blood volume. Systolic blood pressure may be normal but the diastolic is raised, heart rate is 100-120 beats per minute. Patients may have a normal respiratory rate but they are anxious or aggressive in view of the hypovolaemia.⁴

This patient is likely to have had a variceal haemorrhage. There are four classes of hypovolaemic shock by blood loss in adults - I to IV (not five). The criteria are determined by volume of blood lost, vital signs and conscious state.⁴

Classification of haemorrhage:

Parameter	I	II	III	IV
Blood loss (ml)	<750	750-1500	1500-2000	>2000
Blood loss (%)	<15%	15-30%	30-40%	>40%
Pulse rate (beats/min)	<100	>100	>120	>140
Blood pressure	Normal	Decreased	Decreased	Decreased
Respiratory rate (breaths/min)	14-20	20-30	30-40	>35
Urine output (ml/hour)	>30	20-30	5-15	Negligible
CNS symptoms	Normal	Anxious	Confused	Lethargic

CNS = central nervous system.

Modified from Committee on Trauma [Committee on Trauma Advanced Trauma Life Support Manual. Chicago: American College of Surgeons; 1997. pp. 103-112.] 4



[Q: 1976] OnExamination 2012 - Gastroenterology

A 45-year-old woman presents with pruritis.

On examination she has clubbing, palmar erythema and spider naevi. There is also evidence of excoriations and xanthelasma.

Blood results demonstrate deranged liver function tests with a predominantly cholestatic picture but the abdominal ultrasound scan is normal. A subsequent autoimmune screen is positive for antimitochondrial antibodies.

Given the likely diagnosis, which of the following HLA antigens is associated with this disease?

- 1- HLA-A3
- 2- HLA-B5
- 3- HLA-B27
- 4- HLA-B35
- 5- HLA-DR8

Answer & Comments

Answer: 5- HLA-DR8

HLA-A3 is associated with haemochromatosis.

HLA-B5 is associated with Behcet's disease.

Subacute thyroiditis has an association with HLA-B35.

Ankylosing spondylitis is associated with HLA-B27.

Reference:

Bloom S, Webster G, Oxford Handbook of Gastroenterology and Hepatology, Oxford University Press 2006.



[Q: 1977] OnExamination 2012 - Gastroenterology

Which of the following dermatological conditions is associated with oesophageal carcinoma?

- 1- Acanthosis nigricans
- 2- Ichthyosis
- 3- Necrolytic migratory erythema
- 4- Tylosis

5- Vasculitis

Answer & Comments

Answer: 4- Tylosis

Acanthosis nigricans is associated with gastric adenocarcinoma.

Ichthyosis is associated with lymphoma.

Glucagonoma is associated with necrolytic migratory erythema.

Malignancy-associated vasculitis is associated with haematological rather than solid malignancies.



[Q: 1978] OnExamination 2012 - Gastroenterology

A 23-year-old man presents with steatorrhoea and weight loss.

On examination he is found to have a vesicular rash over his elbows and knees which he describes as extremely pruritic.

Which of the following immunoglobulins is characteristically present at the dermo-epidermal junction?

- 1- IgA
- 2- IgD
- 3- IgE
- 4- IgG
- 5- IgM

Answer & Comments

Answer: 1- IgA

Dermatitis herpetiformis is characterised by IgA at the dermo-epidermal junction.

Dermatitis herpetiformis is associated with coeliac disease which is the underlying diagnosis in this patient.

The rash which is pruritic and vesicular is found over the elbows, knees, buttocks,

sacrum, trunk, face and neck. Treatment is with dapsone and a gluten-free diet.

Reference:

Bloom S, Webster G, Oxford Handbook of Gastroenterology and Hepatology, Oxford University Press 2006.



[Q: 1979] OnExamination 2012 - Gastroenterology

A 28-year-old woman presents with a six month history of diarrhoea and weight loss.

On examination her abdomen is mildly distended. She is found to be anaemic, liver function tests are abnormal and iron and folate levels are both low.

Tissue transglutaminase antibody level is elevated and duodenal biopsies demonstrate increased intraepithelial lymphocytes and villous atrophy consistent with a diagnosis of coeliac disease.

Which cell type is responsible for the hypersensitivity response against gluten?

- 1- B cell
- 2- Macrophage
- 3- Monocytes
- 4- Natural killer (NK) cell
- 5- T cell

Answer & Comments

Answer: 5- T cell

Coeliac disease results from small bowel inflammation and atrophy due to T cell mediated hypersensitivity reaction to the alpha-gliadin component of gluten.⁹



[Q: 1980] OnExamination 2012 - Gastroenterology

Which of the following drugs is an inhibitor of cytochrome P450 hepatic enzymes?

- 1- Carbamazepine
- 2- Griseofulvin

- 3- Omeprazole
- 4- Phenytoin
- 5- Rifampicin

Answer & Comments

Answer: 3- Omeprazole

The correct answer is omeprazole.

The remainder of the listed options are all cytochrome P450 inducers.



[Q: 1981] OnExamination 2012 - Gastroenterology

Which of the following demonstrates autosomal co-dominant inheritance?

- 1- Alpha-1-antitrypsin deficiency
- 2- Cowden's disease
- 3- Familial adenomatous polyposis
- 4- Hereditary haemorrhagic telangiectasia
- 5- Peutz-Jeghers syndrome

Answer & Comments

Answer: 1- Alpha-1-antitrypsin deficiency

Alpha-1-antitrypsin (A1AT) deficiency is an autosomal co-dominant disorder - both alleles contribute to the phenotype. The most common allele is M (normal), whilst there are over 100 abnormal alleles (leading to decreased A1AT levels) the most common are Z and S. Individuals with a single normal allele may have reduced levels of A1AT but still produce sufficient normal protein to prevent development of a disease phenotype, this is why some texts will refer to the condition as autosomal recessive. In the disease state there is impaired cellular transport of alpha-1-antitrypsin leading to accumulation within the liver and hepatic injury.

Cowden's disease is an autosomal disorder resulting in multiple hamartomas of skin and mucous membranes.

Familial adenomatous polyposis is the commonest adenomatous polyposis syndrome demonstrating autosomal dominant inheritance.

Hereditary haemorrhagic telangiectasia (Osler-Weber-Rendu syndrome) demonstrates autosomal dominant inheritance and is characterised by telangiectasia affecting the skin and mucous membranes; severe gastrointestinal haemorrhage may occur.

Peutz-Jeghers syndrome demonstrates autosomal dominant inheritance. There is characteristic mucocutaneous pigmentation; polyps can occur anywhere in the gastrointestinal tract but are commonly in the small bowel.

Reference:

Bloom S, Webster G, Oxford Handbook of Gastroenterology and Hepatology, Oxford University Press 2006.



[Q: 1982] OnExamination 2012 - Gastroenterology

A 54-year-old man comes to the gastroenterology clinic for follow up of his ulcerative colitis. Over the past few months he has suffered problems with increasing lethargy, and most recently has been off his food and has begun to suffer from intense itching.

On examination his BP is 145/82 mmHg and pulse 78. He has mildly jaundiced sclerae, and some scratch marks, predominantly on his arms. The rest of the physical examination was unremarkable.

Investigations showed

Haemoglobin 12.0 g/dl(13.5-17.7)

White cells $7.8 \times 10^9/L$ (4-11)

Platelets $189 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 4.4 mmol/l (3.5-5)

Creatinine 95 $\mu\text{mol/l}$ (79-118)

Albumin 35 g/l (35-50)

Alanine aminotransferase 85 U/l (5-40)

Alkaline phosphatase 395 U/l (39-117)

pANCA Positive

Which of the following is the most likely diagnosis?

- 1- Autoimmune hepatitis
- 2- Churg-Strauss syndrome
- 3- Pancreatic carcinoma
- 4- Primary biliary cirrhosis
- 5- Primary sclerosing cholangitis

Answer & Comments

Answer: 5- Primary sclerosing cholangitis

This man's history of lethargy and itching and a blood picture consistent with obstructive liver disease is typical of the condition.

In total between 75 and 90% of patients with primary sclerosing cholangitis (PSC) are thought to have co-existent inflammatory bowel disease, although only around 4% of patients with inflammatory bowel disease develop the condition.

There is often an increase in IgM; and pANCA, aCL antibodies, and ANA are present in up to 84%, 66%, and 53% of patients, respectively.

Endoscopic retrograde cholangiopancreatography (ERCP), the gold standard investigation, demonstrates multiple intrahepatic and extrahepatic bile duct strictures and dilatations, although the non-invasive magnetic resonance cholangiopancreatography (MRCP) is often performed initially.

PSC is chronically progressive with median time to liver failure put at around 12 years. Patients are additionally at increased risk of developing cholangiocarcinoma.



[Q: 1983] OnExamination 2012 - Gastroenterology

In which part of the body is conjugated bilirubin metabolised to urobilinogen?

- 1- Common bile duct
- 2- Hepatic sinusoids
- 3- Large intestine
- 4- Small intestine
- 5- Splenic macrophages

Answer & Comments

Answer: 3- Large intestine

Unconjugated bilirubin is conjugated to glucuronic acid in the hepatocyte.

Conjugated bilirubin passes into the enterohepatic circulation and the bilirubin which evades this system is metabolised by bacteria, primarily in the large intestine, to urobilinogen, then stercobilinogen and eventually oxidised to stercobilin.

Stercobilin gives faeces its brown colour.



[Q: 1984] OnExamination 2012 - Gastroenterology

A 17-year-old girl is commenced on nasogastric feeding due to severe anorexia nervosa. Five days later she becomes increasingly confused.

On examination she was afebrile, appeared appropriately hydrated, with a pulse of 98 beats per minute and blood pressure 96/60 mmHg.

Which one of the following investigations should be requested forthwith?

- 1- Arterial blood gases
- 2- Phosphate
- 3- Serum calcium
- 4- Serum magnesium
- 5- Vitamin B concentrations

Answer & Comments

Answer: 2- Phosphate

The patient appears to have developed the refeeding syndrome.

Refeeding malnourished patients increases basal metabolic rate, with glucose being the predominant energy source.

This anabolic response causes intracellular movement of minerals, and serum levels may fall significantly. These rapid changes in metabolism and electrolyte movement may lead to severe cardiorespiratory and neurological problems resulting in:

Cardiac and respiratory failure

Oedema

Lethargy

Confusion

Coma

Convulsions

Death.

The symptoms of the refeeding syndrome are thought to be due predominantly to hypophosphataemia, but metabolic changes in potassium, magnesium, glucose, and thiamine can also contribute.

The probable answer here is therefore phosphate as hypophosphataemia seems probable.

Calcium depletion is possible but there is absence of tetany.

Zinc deficiency causes skin rashes periorally and around nostrils.

It is extremely difficult to measure vitamin B concentrations, plus her presentation does not sound like Wernicke's neuro-ophthalmological features.



[Q: 1985] OnExamination 2012 - Gastroenterology

Which of the following statements regarding jejunal biopsy is correct?

- 1- Electron microscopy is necessary to confirm the presence of villous atrophy
- 2- Sub-total villous atrophy is diagnostic of gluten-sensitive enteropathy and is not found in other conditions
- 3- It is contraindicated over the age of 70 years
- 4- In tropical countries apparently healthy people have a mucosal structure which would be regarded as abnormal in Europe
- 5- It can be used to diagnose Whipple's disease

Answer & Comments

Answer: 5- It can be used to diagnose Whipple's disease

A. The villus atrophy may be seen with a magnifying glass.

B. Sub-total villus atrophy is seen in a number of conditions other than coeliac disease, for example:

Severe tropical sprue

Cow's milk/soya sensitivity in children

Gastroenteritis

Whipple's disease

Hypogammaglobulinaemia

Neomycin therapy

Laxative abuse

Norwalk agent.

C. There is a group of patients who present with coeliac disease in older age - sometimes in their 90s. They present with iron deficiency anaemia, osteoporosis or weight loss.

D. They would not be 'healthy'.



[Q: 1986] OnExamination 2012 -
Gastroenterology

A 70-year-old man is admitted with pruritus and jaundice of two weeks duration and 2 kg weight loss over the last 2 years.

He had not drunk any alcohol for at least eight years.

One month ago he had completed a course of co-amoxiclav which had been prescribed by his GP for sinusitis and he was also taking ibuprofen for hip osteoarthritis.

Investigations reveal:

Albumin 38 g/l (37-49)

Bilirubin 200 mol/l (1-22)

AST 150 U/l (5-35)

Alkaline phosphatase 200 U/l (45-105)

Abdominal ultrasound reveals gallstones but no biliary duct dilatation.

What is the most likely cause of his jaundice?

- 1- Cholangio-carcinoma
- 2- Co-amoxiclav
- 3- Hepatitis B infection
- 4- Hepatitis C infection
- 5- Ibuprofen

Answer & Comments

Answer: 2- Co-amoxiclav

Co-amoxiclav (Augmentin) is notorious for causing drug-induced jaundice, often with a mixed hepatitic/cholestatic picture. A four week delay in symptoms and signs is not unusual.

Flucloxacillin is another common culprit.

The patient must be warned that this could reoccur if he is given co-amoxiclav again.

There is nothing in the history (risk factors) to suggest that this might be acute hepatitis B infection and there is no evidence of chronic

liver disease to suggest that this might be a result of chronic viral hepatitis.

Non-steroidal anti-inflammatory drugs such as ibuprofen and diclofenac may cause a drug-induced hepatitis however the pattern of abnormality if a transaminitis and hyperbilirubinaemia is not usually seen.

Cholangiocarcinoma may present with an obstructive jaundice and weight loss however it is a relatively rare condition in those without risk factors for the disease and in a case such as this whilst ultrasound may not demonstrate the actual lesion one would expect it to show evidence of biliary duct obstruction and more likely than not evidence of hepatic metastases.



[Q: 1987] OnExamination 2012 -
Gastroenterology

A 58-year-old man presents to your clinic with dysphagia for solids for the past three months. He also complains of weight loss and loss of appetite. There is no other past medical history, apart from symptoms of indigestion and heartburn for the past five years.

He regularly takes Gaviscon and Rennie tablets. He is a heavy smoker and a regular drinker. He undergoes endoscopy, which reveals a small tumour at the lower end of the oesophagus.

What is the most likely aetiological cause for the tumour?

- 1- Alcohol
- 2- Barrett's oesophagus
- 3- Helicobacter pylori
- 4- Oesophageal candidiasis
- 5- Oesophageal pouch

Answer & Comments

Answer: 2- Barrett's oesophagus

The history suggests a five year history of gastro-oesophageal reflux. This can cause a

columnisation of the oesophageal mucosa known as Barrett's oesophagus, which is a premalignant state. Surveillance endoscopies are recommended every three years.

The development of dysphagia for solids and weight loss suggests the presence of oesophageal carcinoma.



[Q: 1988] OnExamination 2012 - Gastroenterology

A 38-year-old woman presents with a recent history of pruritis, fatigue and jaundice.

Investigations revealed:

Liver biopsy: Shows periportal fibrosis with periportal inflammation and prominent enlargement of the portal tracts.

Which one of the following antibodies is most likely to be found in the blood?

- 1- Anticardiolipin
- 2- Anticentromere
- 3- Antimitochondrial
- 4- Antimyeloperoxidase
- 5- Antinuclear

Answer & Comments

Answer: 3- Antimitochondrial

Primary biliary cirrhosis (PBC) is a slowly progressive autoimmune disease of the liver that primarily affects women in their fifth decade. It is characterised by portal inflammation and immune-mediated destruction of the intrahepatic bile ducts, which results in reduced bile secretion and retention of toxic substances. This leads to further hepatic damage, fibrosis and cirrhosis. Serologically, PBC is characterised by antimitochondrial antibodies, which are present in 90-95% of patients (often before clinical signs develop) and have a specificity of 98%. These antibodies are specific for the E2 subunit of the pyruvate dehydrogenase complex, and it is unclear why they only affect

the liver when all nucleated cells contain mitochondria. Twin and family studies suggest there is a significant genetic predisposition. Treatment is empirical, and patients may go on to require a liver transplant.

Anticardiolipin antibodies are most commonly associated with antiphospholipid syndrome, which increases the risk of thrombosis.

Anticentromere antibodies are associated with limited systemic sclerosis.

Myeloperoxidase is the antigen which p-ANCA (anti-neutrophil cytoplasmic antibodies) targets. It is associated with a number of vasculitides, but most classically microscopic polyangiitis.

Antinuclear antibodies are associated with 80-90% of cases of systemic lupus erythematosus, but are also found with Sjögren's syndrome, rheumatoid arthritis, autoimmune hepatitis, systemic sclerosis and polymyositis and dermatomyositis.



[Q: 1989] OnExamination 2012 - Gastroenterology

With which of the following is non-alcoholic steatohepatitis associated?

- 1- A benign course in all cases
- 2- Alcohol abuse
- 3- Insulin resistance
- 4- Normal level of liver enzymes
- 5- Viral hepatitis

Answer & Comments

Answer: 3- Insulin resistance

Non-alcoholic steatohepatitis (NASH) is associated with insulin resistance, hyperlipidaemia and chronic moderately elevated liver enzymes.

The diagnosis is made only by histology of liver biopsy which shows lesions suggestive of

ethanol intake in a patient known to consume less than 40 g of alcohol per week.

It is not necessarily benign: cryptogenic cirrhosis in patients is a substantial number of probably end-stage NASH.



[Q: 1990] OnExamination 2012 - Gastroenterology

A 45-year-old gentleman presents with dyspepsia of five months duration and loss of weight.

Examination reveals mild pallor and slight epigastric tenderness. Gastroscopy reveals 5 mm posterior ulcer in the first part of duodenum and 2 cm mass on lesser curve of the stomach. Biopsy of the mass reveals mucosa-associated lymphoid tumour confined to gastric mucosa. He has tested positive for H. pylori infection.

Which of the following treatment options will be appropriate for him?

- 1- Chemotherapy
- 2- H. pylori eradication
- 3- Proton pump inhibitor
- 4- Radiotherapy
- 5- Surgery

Answer & Comments

Answer: 2- H. pylori eradication

Lymphomas restricted to the gastric mucosa usually disappear when H. pylori is eradicated.

These lesions are less likely to respond to H. pylori eradication alone if they extend beyond the gastric mucosa. Chemotherapy or surgical excision may then be indicated.

Duodenal ulcer will also disappear with H. pylori eradication.



[Q: 1991] OnExamination 2012 - Gastroenterology

A 50-year-old man who is well known to the casualty department attends inebriated.

He has an alcoholic encephalopathy with a Glasgow coma scale of 13. He is jaundiced, describes no symptoms, but is mildly short of breath.

You are presented with his blood results:

Haemoglobin 7.4 g/dl (12 - 16 g/dl)

White cell count $10.1 \times 10^9/L$ ($4 - 10 \times 10^9/L$)

Platelets $137 \times 10^9/L$ ($140-400 \times 10^9/L$)

Sodium 133 mmol/l (133 - 144 mmol/L)

Potassium 3.7 mmol/l ($3.5 - 5 \times 10^9/L$)

Urea 12 mmol/l ($3 - 8 \times 10^9/L$)

Creatinine 113 $\mu\text{mol/l}$ (50 - 100)

AST 124 U/L (5 - 40)

Alkaline Phosphatase 224 U/L (50 - 110)

Total Protein 54 g/l (60 - 80g/L)

Bilirubin 63 $\mu\text{mol/l}$ (3 - 18)

Cholesterol 15.3 mmol/l ($<5.5 \text{ mmol/L}$)

Triglycerides 7.2 mmol/l ($<2.2 \text{ mmol/L}$)

Blood film Profound spherocytosis

Which of the following is the most appropriate treatment for this patient?

- 1- IV steroids
- 2- MRI pancreas
- 3- Oesophago-gastro-duodenoscopy
- 4- Supportive therapy
- 5- Urgent laparotomy

Answer & Comments

Answer: 4- Supportive therapy

A combination of jaundice, alcoholic hepatitis, hyperlipidaemia, and haemolysis is known as Zieve's syndrome.

There is no specific treatment for Zieve's syndrome, but supportive therapy is indicated which includes:

Correction of clotting abnormalities

Treatment of haemolysis

Treating alcohol withdrawal

Preventing further alcohol intake and

Adequate nutrition.

The spherocytosis is the result of the haemolysis.

Pancreatitis is a possible differential diagnosis here, but in the first instance one would request an amylase rather than a magnetic resonance imaging (MRI) of the pancreas.



[Q: 1992] OnExamination 2012 - Gastroenterology

A 49-year-old woman presents with a six month history of pruritus.

Examination reveals jaundice, xanthelasma, scratch marks, vitiligo and 3 cm hepatomegaly. She was afebrile. Liver function tests reveal raised bilirubin, alkaline phosphatase, gamma glutamyl transferase and mildly elevated alanine transaminase and aspartate transaminase.

Which of the following conditions will most likely be found in this woman?

- 1- Constipation
- 2- Haemolysis
- 3- Lymphadenopathy
- 4- Vitamin A deficiency
- 5- Vitamin B complex deficiency

Answer & Comments

Answer: 4- Vitamin A deficiency

The most likely diagnosis is primary biliary cirrhosis as evidenced by pruritus, hypercholesterolaemia, jaundice, raised

alkaline phosphatase (ALP) and gamma glutamyl transferase (γ -GT).

Malsorption of fat-soluble vitamins (A, D, K) is common.



[Q: 1993] OnExamination 2012 - Gastroenterology

A group of construction workers presented to the emergency department with diarrhoea, flushing, sweating and a hot mouth. They fell ill minutes after eating lunch in the staff canteen. They admitted that they had eaten tuna fish.

What is the likely cause of food poisoning?

- 1- Clostridium perfringens
- 2- Heavy metal
- 3- Mushroom
- 4- Scrombotoxin
- 5- Staphylococcus aureus

Answer & Comments

Answer: 4- Scrombotoxin

Scrombotoxin food poisoning is caused by the ingestion of foods that contain high levels of histamine and possibly other vasoactive amines and compounds.

Histamine and other amines are formed by the growth of certain bacteria and the subsequent action of their decarboxylase enzymes on histidine and other amino acids in food, by spoilage of foods such as fishery products, particularly tuna or mahi mahi.

Incubation period is 10-60 minutes.



[Q: 1994] OnExamination 2012 - Gastroenterology

A 45-year-old female develops profuse watery diarrhoea with lower abdominal pain seven days after undergoing laparoscopic cholecystectomy.

What is the most likely diagnosis?

- 1- Abdominal sepsis
- 2- Bile acid diarrhoea
- 3- Campylobacter gastroenteritis
- 4- Pseudomembranous colitis
- 5- Pseudo-obstruction

Answer & Comments

Answer: 4- Pseudomembranous colitis

Prophylactic antibiotics are frequently given in both laparoscopic and open cholecystectomy.

Typically broad spectrum antibiotics are administered with a consequent risk of pseudomembranous colitis. However, it must also be remembered that *Clostridium difficile* may also be contracted on the wards.

Bile acid diarrhoea may affect 10% of patients following cholecystectomy. Typically it is post-prandial; the bile, with no gall bladder to store it, is excreted directly into the gut.



[Q: 1995] OnExamination 2012 - Gastroenterology

Which of the following is most likely to be reversible following venesection in a 45-year-old male with haemochromatosis?

- 1- Arthropathy
- 2- Cardiomyopathy
- 3- Cirrhosis
- 4- Diabetes mellitus
- 5- Hypopituitarism

Answer & Comments

Answer: 2- Cardiomyopathy

Disorders that are potentially reversible in haemochromatosis include the dermal pigmentation and cardiomyopathy.

Similarly there are improvements in liver function tests.

However, diabetes, cirrhosis, hypogonadism and arthropathy are usually irreversible.



[Q: 1996] OnExamination 2012 - Gastroenterology

A 17-year-old student returns from a backpacking trip to Nepal with a two week history of offensive diarrhoea and weight loss.

What is the most likely infective organism?

- 1- *Escherichia coli* 0157
- 2- *Giardia intestinalis* (G.lamblia)
- 3- *Salmonella typhi*
- 4- *Shigella flexneri*
- 5- *Yersinia enterocolitica*

Answer & Comments

Answer: 2- *Giardia intestinalis* (G.lamblia)

The history of diarrhoea over a couple of weeks makes giardiasis the most likely diagnosis here.

Giardia lamblia is a protozoan which can cause traveller's diarrhoea. It is transmitted by cysts from faecally contaminated water, or between people. The incubation period is 3 days to 3 weeks, and the symptoms can persist for several weeks. Diarrhoea tends to be the presenting symptom, and classically has a highly offensive smell. This is often followed by nausea, cramps, abdominal pain and bloating. The diarrhoea can become persistent, and lead to malabsorption and weight loss. Unlike other infective causes of chronic diarrhoea, giardia readily affects immunocompetent hosts as well as the immunocompromised.

Giardia is diagnosed by visualising cysts in stool, or trophozoites in small bowel mucosal biopsy. It is treated with tinidazole (2g single dose), or metronidazole (3-10 days). Metronidazole has been shown to cure over 90% of patients, and is often better tolerated than tinidazole. Paraomycin can be used in

pregnancy, as there is no systemic absorption. Resistant infection can often be cured with a combination of metronidazole and quinacrine.

Escherichia coli 0157 is a rare cause of infectious gastroenteritis. It usually causes bloody diarrhoea, which lasts less than a week. It can be complicated by haemolytic uraemic syndrome. *Shigella* and *Yersinia* also usually cause dysentery.

Salmonella typhi causes typhoid fever, which typically presents as a systemic illness with intermittent diarrhoea.



[Q: 1997] OnExamination 2012 - Gastroenterology

A 75-year-old male presents with a two month history of dyspnoea, weight loss and generalised lethargy. His medical history included a previous left-sided hemiparesis due to stroke for which he took aspirin and perindopril.

Examination revealed residual left sided hemiparesis together with a pale and slightly jaundiced appearance.

Investigations show:

Haemoglobin 5 g/dL (13.0-18.0)

MCV 109 fL (80-96)

White cell count $2 \times 10^9/L$ (4-11)

Platelets $45 \times 10^9/L$ (150-400)

Urinalysis: Increased urobilinogen.

What is the next most appropriate investigation?

- 1- Bone marrow aspirate
- 2- Direct antiglobulin test
- 3- Endoscopy
- 4- Serum haptoglobins
- 5- Vitamin B₁₂ concentration

Answer & Comments

Answer: 5- Vitamin B₁₂ concentration

In this situation, serum B12 estimation is the correct choice. With a pancytopenic picture and raised mean corpuscular volume (MCV), the most appropriate step is to check the B12 and folate.

The other choices are considered only after the basic assays.

Haemolysis does not explain the low WCC, nor the thrombocytopenia.

A haptoglobin only adds weight to a diagnosis of haemolysis, and a RBC-labelled scan would add greater sensitivity to the diagnosis of haemolysis.

The mild jaundice is typical of megaloblastic anaemia (Vitamin B₁₂ or folate deficiency) because of increased destruction of red cell precursors in the bone marrow.



[Q: 1998] OnExamination 2012 - Gastroenterology

A 70-year-old woman presented with a history of pancreatitis and persistent diarrhoea.

She also gave a history of osteoporosis and had had a deep vein thrombosis.

Which one of the following drugs will become less effective after she starts taking cholestyramine to relieve intolerable itching?

- 1- Aspirin
- 2- Folic acid
- 3- Thiamine
- 4- Vitamin D
- 5- Warfarin

Answer & Comments

Answer: 4- Vitamin D

Cholestyramine is an anion exchange resin, and will interfere with the absorption of fat-soluble vitamins.

Thus vitamin D absorption will be reduced, making treatment with this drug less effective when given along with cholestyramine.

Cholestyramine may enhance or reduce the anticoagulant effect of warfarin (see BNF).



[Q: 1999] OnExamination 2012 - Gastroenterology

A 19-year-old student presents with weight loss and blood loss per rectum. You organise a flexible sigmoidoscopy.

Which of the following histological features would favour a diagnosis of Crohn's disease and not ulcerative colitis?

- 1- Caseating granulomata
- 2- Crypt abscesses
- 3- Goblet cell mucus depletion
- 4- Lymphocyte infiltrate of the lamina propria
- 5- Metaplastic polyp formation

Answer & Comments

Answer: 4- Lymphocyte infiltrate of the lamina propria

Ulcerative colitis is characterised by mucosal inflammation with

General inflammatory cell infiltration

Goblet-cell mucus depletion

Crypt abscesses

Crypt shortening

Branching.

There is continuous inflammation, worsening from caecum to rectum.

In contrast, Crohn's disease is characterised by transmural inflammation, with

Neutrophil infiltrates and lymphoid aggregates

Fissures

Preservation of crypt architecture

Non-caseating granulomata.

There is patchy inflammation from mouth to anus.



[Q: 2000] OnExamination 2012 - Gastroenterology

An asymptomatic 40-year-old female underwent an abdominal ultrasound scan as part of a clinical trial and was noted to have gallstones but entirely normal liver function tests.

Which one of the following is the most appropriate management?

- 1- Chenodeoxycholic acid
- 2- Laparoscopic cholecystectomy
- 3- Lithotripsy
- 4- Observation
- 5- Ursodeoxycholic acid

Answer & Comments

Answer: 4- Observation

This patient is asymptomatic and does not require any treatment at present. 'If it ain't broke don't fix it' is the general rule.

There is no proven role for the use of oral drugs to try to reduce the formation of gallstones.

The only definitive treatment would be a cholecystectomy but that is not generally offered for asymptomatic gallstones.



[Q: 2001] OnExamination 2012 - Gastroenterology

A 42-year-old man being investigated for diabetes and impotence is noted to have the following results:

Alanine aminotransferase 30 U/l (5-35)

Aspartate aminotransferase 22 U/l (1-31)

Fasting plasma glucose 7.4 mmol/l (3.0-6.0)

Ferritin 500 µg/l (15-300)

Which one of the following would be the next most appropriate investigation?

- 1- Bone marrow smear and iron stain
- 2- Liver biopsy
- 3- Red cell protoporphyrins
- 4- Serum transferrin receptors
- 5- Transferrin saturation

Answer & Comments

Answer: 5- Transferrin saturation

This patient has a suspected diagnosis of haemochromatosis as suggested by the presentation and laboratory investigations including elevated ferritin.

The next investigation would be measurement of transferrin saturation, and then, if elevated (above 45%), genotyping (homozygosity for C282y mutations) would next be considered and would be expected to clinch the diagnosis.

In the event of rarer mutations confirmation with liver biopsy may be required.



[Q: 2002] OnExamination 2012 - Gastroenterology

Which of the following statements concerning transferrin is correct?

- 1- In the absence of anaemia transferrin is 80% saturated with iron
- 2- Levels are elevated in haemochromatosis
- 3- Levels are elevated in patients on the oral contraceptive pill
- 4- Transferrin binds ferrous iron
- 5- Transferrin levels fall during pregnancy

Answer & Comments

Answer: 3- Levels are elevated in patients on the oral contraceptive pill

Pregnancy and the oral contraceptive pill (OCP) both increase transferrin levels. Iron is carried in the blood bound to transferrin. Fe²⁺ (ferrous iron) is oxidised to Fe³⁺ (ferric iron) by caeruloplasmin to bind to transferrin which is about one third saturated with iron.

The saturation of transferrin (plasma iron concentration/TIBC x 100) is used as a measure of iron stores. A value below 16% is indicative of iron deficiency.

The transferrin level and the TIBC rise in iron deficiency. Pregnancy and the OCP both increase transferrin levels; whereas transferrin and TIBC fall in iron overload, percentage saturation is increased in haemochromatosis.



[Q: 2003] OnExamination 2012 - Gastroenterology

An 80-year-old woman presents with confusion associated with a chest infection.

She received standard treatment, and four days later she developed green, then bloody diarrhoea.

Which of the following organisms is most likely to be responsible for her diarrhoea?

- 1- Campylobacter jejuni
- 2- Clostridium difficile
- 3- Escherichia coli 0157
- 4- Methicillin-resistant Staphylococcus aureus
- 5- Vancomycin-resistant Enterococcus

Answer & Comments

Answer: 2- Clostridium difficile

This is typical of Clostridium infection with pseudomembranous colitis induced by prior treatment with broad spectrum antibiotics such as cefuroxime, Augmentin and the macrolides.

It is treated with oral vancomycin/metronidazole.



[Q: 2004] OnExamination 2012 -
Gastroenterology

Which of the following statements concerning iron metabolism is correct?

- 1- Approximately 0.1% of body iron circulates in the plasma
- 2- Approximately 90% of dietary iron is absorbed in the intestine
- 3- The main route of excretion is the liver
- 4- The serum ferritin concentration is reduced characteristically following surgery
- 5- The transferrin content of intestinal mucosal cells is high when body iron stores are high

Answer & Comments

Answer: 1- Approximately 0.1% of body iron circulates in the plasma

Approximately 4 mg of iron circulate within the plasma with a total body iron store of 3-4 g (2500 mg in the RBCs, 500 mg in liver, 500 mg in macrophages and about 500 mg in muscle).

From an intake of approximately 6 mg/1000 kcal of dietary iron only 15% is bioavailable.

The majority of iron contained within the RBCs is metabolised and re-utilised but 1 mg per day is lost through the gut.

Ferritin, the plasma protein responsible for binding iron, is an acute phase reactant protein and increases in inflammatory conditions following surgery.

Transferrin is a glycoprotein responsible for internal iron exchange and the content within mucosal cells is naturally low in haemochromatosis with high saturation.



[Q: 2005] OnExamination 2012 -
Gastroenterology

An 81-year-old frail man admitted with a stroke becomes increasingly drowsy after

receiving nasogastric (NG) feeding for five days.

Which biochemical abnormality is the most likely cause of his drowsiness?

- 1- Hyperglycaemia
- 2- Hypermagnesaemia
- 3- Hypernatraemia
- 4- Hypocalcaemia
- 5- Hypophosphataemia

Answer & Comments

Answer: 5- Hypophosphataemia

The chronology of his presentation five days after receiving NG feeds suggests hypophosphataemia associated with the re-feeding syndrome.

This is well described in elderly frail subjects who may have prior poor nutrition.

However, other electrolyte abnormalities are also described in association with NG feeds, for example, hypernatraemia.

But with this briefest of histories and the five days it is likely that the examiner is looking for hypophosphataemia.



[Q: 2006] OnExamination 2012 -
Gastroenterology

Which one of the following organs is in direct contact with the anterior surface of the left kidney, without being separated from it by peritoneum?

- 1- Duodenum
- 2- Jejunum
- 3- Pancreas
- 4- Spleen
- 5- Stomach

Answer & Comments

Answer: 3- Pancreas

This is a basic anatomy question.

The only entirely retroperitoneal structure listed in the question is the pancreas, the body of which is in direct approximation to the anterior surface of the left kidney. The duodenum (with the exception of the first part) is also retroperitoneal but not in direct approximation to the left kidney. The following mnemonic lists the retroperitoneal structures:

S uprarenal Glands (Adrenals)

A orta/IVC

D uodenum (except first part)

P ancreas (Tail is intraperitoneal)

U reters

C olon (Ascending and Descending only)

K idneys

E sophagus

R ectum

The spleen and stomach, though in contact, are covered in peritoneum.



[Q: 2007] OnExamination 2012 - Gastroenterology

A 28-year-old lady develops abdominal pain, jaundice and ascites worsening over a week.

She drinks ten units of alcohol each week and takes the oral contraceptive pill.

Which of the following findings would make a diagnosis of hepatic vein thrombosis (Budd-Chiari syndrome [BCS]) most likely?

- 1- Acute liver failure
- 2- Alanine aminotransferase (ALT) of 345 U/L (5 - 35)
- 3- Ankle oedema
- 4- Ascites fluid protein of 38 g/L
- 5- Tender enlarged liver

Answer & Comments

Answer: 5- Tender enlarged liver

The most common causes of an acute severe liver injury in a young woman are:

Viruses (including hepatitis A virus [HAV], hepatitis B virus [HBV])

Drugs (particularly paracetamol overdose)

Autoimmune hepatitis and

Hepatic vein thrombosis (often precipitated by pregnancy or oral contraceptive pill [OCP] use).

The presence of liver failure, ankle oedema, and an exudative ascites do not help differentiate between these aetiologies.

The ALT of 345 is moderately elevated and compatible with BCS. With viral or drug related hepatitis the peak ALT is usually much higher than this; the ALT may already be on the way down if she has had symptoms for a week.

Tender hepatomegaly is one of the hallmarks of BCS.

In acute severe viral, autoimmune or drug / toxin related liver disease the necrotic liver decreases in size.



[Q: 2008] OnExamination 2012 - Gastroenterology

Which of the following is true of spontaneous bacterial peritonitis (SBP)?

- 1- A survival rate of over 50% is expected at one year
- 2- Gentamicin is the treatment of choice
- 3- Is characteristically caused by aerobic bacteria
- 4- Is diagnosed by culture of ascitic fluid
- 5- Is due to intestinal perforation

Answer & Comments

Answer: 3- Is characteristically caused by aerobic bacteria

SBP is a frequent complication of the ascites of cirrhosis. It is diagnosed by ascitic fluid examination which reveals a PMN count of >250/ml.

SBP has poor prognostic significance with a one year survival after a diagnosis of between 30-50%.

It is, as the name suggests, a spontaneous event that is not a consequence of intestinal perforation. It is speculated that the infective organism may leak into the ascitic fluid via the blood or from intestinal overgrowth.

Organisms should be cultured by directly collecting into blood culture bottles.

It is typically caused by aerobic Gram negative bacteria. Hence cefotaxime is regarded as the drug of choice for treatment.



[Q: 2009] OnExamination 2012 - Gastroenterology

Which clinical feature is consistent with a diagnosis of VIPoma?

- 1- Alkalosis
- 2- Hypoglycaemia
- 3- Hypokalaemia
- 4- Increased gastric acid secretion
- 5- Provocation of VIP release by somatostatin

Answer & Comments

Answer: 3- Hypokalaemia

A VIPoma is a tumour secreting vasoactive intestinal polypeptide. They are mostly located in the pancreas but occasionally involve the sympathetic chain or adrenal cortex.

In health, VIP promotes electrolyte, water and hormone secretion from the pancreas and gut,

stimulates lipolysis, glycolysis and bile flow, and inhibits gastric acid secretion.

Symptoms:

Secretory diarrhoea ('pancreatic cholera')

Weight loss

Dehydration

Abdominal pain

Cutaneous flushing due to peripheral vasodilatation.

Biochemical features:

Hypokalaemic acidosis due to loss of alkaline secretions

Glucose may be elevated

VIP can be measured in plasma and is high

Achlorhydria with reduced gastric acid secretion.



[Q: 2010] OnExamination 2012 - Gastroenterology

A 36-year-old man presented with a three day history of bloody diarrhoea.

He was afebrile and mildly icteric.

Investigations revealed:

Haemoglobin 10.5 g/dL (13.0-18.0)

White cell count $19 \times 10^9/L$ ($4-11 \times 10^9$)

Platelets $70 \times 10^9/L$ ($150-400 \times 10^9$)

Serum urea 12.5 mmol/L (2.5-7.5)

Serum aspartate aminotransferase 90 U/L (1-31)

Prothrombin time 12s (11.5-15.5)

Blood film: Fragmented red cells

What is the most likely cause of his illness?

- 1- Escherichia coli O157 colitis
- 2- Ischaemic colitis
- 3- Leptospirosis
- 4- Salmonella enterocolitis

5- Ulcerative colitis

Answer & Comments

Answer: 1- Escherichia coli 0157 colitis

The combination of:

Bloody diarrhoea

Haemolytic anaemia

Thrombocytopenia but normal clotting and

Renal impairment

suggests haemolytic-uraemic syndrome.

This is associated with E coli 0157 toxin most commonly.



[Q: 2011] OnExamination 2012 - Gastroenterology

A 24-year-old woman was referred with tiredness and intermittent bloody diarrhoea and a past history of cerebral venous thrombosis.

On examination the sclera of the right eye was inflamed and multiple mouth ulcers were noted. At the colonoscopy, which confirmed colitis, two large vulval ulcers were noted.

Which is the most likely diagnosis?

- 1- Behcet's disease.
- 2- Crohn's disease.
- 3- HIV infection
- 4- Syphilis
- 5- Ulcerative colitis.

Answer & Comments

Answer: 1- Behcet's disease.

This is a classical description of the presentation of Behcet's, with oral and genital ulceration, colitis and scleritis.



[Q: 2012] OnExamination 2012 - Gastroenterology

A 24-year-old woman had ulcerative colitis (UC) for seven years and was prescribed mesalazine 1.5 g per day.

She smoked 20 cigarettes per day and was 10 weeks pregnant. She complained of worsening symptoms with six bloody stools per day.

Which one of the following statements is correct?

- 1- Azathioprine is relatively contraindicated.
- 2- Initiation of an elemental diet risks fetal malnutrition.
- 3- Oral corticosteroids are contraindicated.
- 4- Oral mesalazine therapy should be withdrawn.
- 5- Termination of the pregnancy is advisable.

Answer & Comments

Answer: 1- Azathioprine is relatively contraindicated.

The effect of pregnancy on UC is variable.

Oral corticosteroids and mesalazine are not contraindicated.

In general, the health of a mother with UC is the best predictor of the outcome of the pregnancy. Hence drug treatment is preferred to leaving active disease untreated.

The BNF states that azathioprine should not generally be started during pregnancy, but it is only relatively contraindicated. However, azathioprine is concentrated in breastfeeding.

In the context of pregnancy, an elemental diet does not risk maternal and/or fetal malnutrition.



[Q: 2013] OnExamination 2012 - Gastroenterology

A 48-year-old woman complains of pruritis, steatorrhoea and bruising.

On examination, she is jaundiced, pigmented with spider naevi and hepatosplenomegaly.

What is the most likely underlying diagnosis?

- 1- Alcoholic liver disease
- 2- Alpha-1 antitrypsin deficiency
- 3- Autoimmune hepatitis
- 4- Primary biliary cirrhosis
- 5- Wilson's disease

Answer & Comments

Answer: 4- Primary biliary cirrhosis

She has clinical evidence of chronic liver disease and portal hypertension.

The two main conditions causing pigmentation and chronic liver disease are primary biliary cirrhosis (PBC) and haemochromatosis.

PBC is a chronic cholestatic inflammatory liver disease, the aetiology of which is probably autoimmune. It most commonly affects middle-aged women.

There is jaundice with skin pigmentation, risk of developing oesophageal varices and fat malabsorption, leading to deficiency of the vitamins A, D, E, K (hence osteomalacia and also bruising).

Serum antimitochondrial antibody is positive in 95-99% cases.



[Q: 2014] OnExamination 2012 - Gastroenterology

A 26-year-old presents in the first trimester of her first pregnancy (six weeks gestation) for an antenatal check; she feels well.

Blood tests show a bilirubin of 40 $\mu\text{mol/L}$ (1-22); the other LFTs are completely normal.

Which of the following is the most likely diagnosis?

- 1- Cholestasis of pregnancy
- 2- Dubin-Johnson syndrome (DJS)

- 3- Gilbert's syndrome
- 4- Primary biliary cirrhosis (PBC)
- 5- Primary sclerosing cholangitis (PSC)

Answer & Comments

Answer: 3- Gilbert's syndrome

Gilbert's is the most common condition causing mild isolated hyperbilirubinaemia.

PBC and PSC are much less common conditions and are almost always associated with a rise in the other liver function tests (particularly alkaline phosphatase [ALP] and gammaglutamyltransferase [GGT]).

DJS is much less common than Gilbert's.

Intrahepatic cholestasis of pregnancy is relatively common but usually occurs in the second or third trimester; ALP is usually high, risk increases with multiparity.



[Q: 2015] OnExamination 2012 - Gastroenterology

A 20-year-old man was found to have iron deficiency anaemia when he went to donate blood. The Blood Transfusion Service contacted his general practitioner, who referred the patient to the outpatient clinic for further investigation.

Generally, the patient was very well. He had a good appetite, his weight was steady and he ate a normal diet. He had a normal bowel habit and had never passed any blood, mucus or diarrhoea in his stools. The patient denied knowledge of any overt blood loss from any other source.

His general practitioner had organised an open access endoscopy which was normal; duodenal biopsies were unremarkable. He had a limited knowledge of his family history as his mother had died in childbirth and as a result he was an only child. His father had died of what he thought was secondary liver and lung cancer but he was unsure.

On general physical examination he was fit and athletic. The skin and mucosal membranes were unremarkable. Pulse was 70 beats per minute and regular with a blood pressure of 132/78 mmHg. Heart sounds were normal and the chest was clear. His abdomen was soft and non-tender with no palpable masses or organs. Rectal examination was normal. On viewing the rectal mucosa through a rigid sigmoidoscope the colonic mucosa was covered in innumerable polyps.

What specific genetic abnormality is responsible for this appearance?

- 1- Germline mutation of the STK11 gene on chromosome 19
- 2- Heterozygous mutation of the MYH gene
- 3- Loss of the APC gene on chromosome 5
- 4- Mutations in mismatch repair genes (for example, MSH2)
- 5- Mutation of the p53 tumour suppressor gene

Answer & Comments

Answer: 3- Loss of the APC gene on chromosome 5

The patient will need a full colonoscopy and biopsy but the information presented is highly suggestive of familial adenomatous polyposis (FAP), caused by the loss of the APC gene on the short arm of chromosome 5.

Peutz-Jegher's syndrome (PJS) is an autosomal dominant inherited disorder caused by a germline mutation of the STK11 (serine threonine kinase 11) gene, usually located on the long arm of chromosome 19. Peutz-Jegher's syndrome is associated with intestinal hamartomatous polyps, but is usually (90%) associated with peri-oral pigmentation.

Hereditary nonpolyposis colon cancer (HNPCC) and MYC polyposis do not cause multiple polyps as suggested in this case. In HNPCC, affected individuals inherit a mutation in one of several genes involved in DNA

mismatch repair, including MSH2, MLH1, and PMS2.

Homozygous mutations in the MYH gene have been associated with a phenotype of multiple colorectal adenomas with or without cancer. This accounts for a proportion of FAP patients without a pathogenic APC mutation.

Mutations in the p53 tumour suppressor gene are found in many different cancers. While mutations in p53 are seen in cases of colon cancer, the question asks for the specific mutation associated with polyposis coli.

The main differential in this question is between FAP and PJS but the lack of perioral pigmentation favours FAP as the diagnosis.



[Q: 2016] OnExamination 2012 - Gastroenterology

You review an 84-year-old lady in the gastroenterology clinic.

She has been referred by her GP with a three month history of change in bowel habit and weight loss. Recently she has noticed PR bleeding with blood in the stool. There is a history of ischaemic heart disease with a previous myocardial infarction three years ago. She suffers from stable angina and congestive cardiac failure.

Which of the following investigations would be most appropriate to make the diagnosis?

- 1- Barium enema
- 2- Colonoscopy
- 3- CT abdomen
- 4- CT colonography
- 5- Flexible sigmoidoscopy

Answer & Comments

Answer: 5- Flexible sigmoidoscopy

Colorectal carcinoma needs to be excluded in this case. This is the third most common cancer in the UK, after breast and lung. Three

quarters of cases occur in people aged over 65y. Around 50% survive for over 5 years following diagnosis, but it remains the second most common cause of cancer death in the UK. The UK now has a national screening programme for those over 60y, which uses faecal occult blood testing.

With regard to the investigation of colorectal carcinoma, colonoscopy should be offered to patients without major co-morbidity. If a lesion suspicious of cancer is detected, a biopsy should be performed to obtain a histological diagnosis.

If the colonoscopy is incomplete, it should be repeated or CT colonography or barium enema should be performed.

Flexible sigmoidoscopy then barium enema should be offered for patients with major co-morbidity. CT colonography is an alternative if the local radiology service is competent in this technique. A small dose of oral contrast is administered 24 hours prior to the procedure and then the colon is imaged using helical CT scanning. Most CT colonography protocols require the use of bowel cleansing agents. The advantages over colonoscopy include no requirement for sedation, smaller risk of perforation, and extra-colonic pathology can also be demonstrated.

If a lesion suspicious of cancer is detected on CT colonography, a colonoscopy and biopsy should be offered (unless there are absolute contraindications).

CT chest, abdomen, pelvis should be offered after the diagnosis is made to estimate the stage of the disease. Patients with a rectal tumour should also undergo MRI to assess local disease. Endorectal ultrasound can then be offered if MRI shows disease amenable to local excision (or if MRI is contraindicated). Digital rectal examination is not part of the staging investigations.

In this case, the presence of congestive cardiac failure is a major co-morbidity. A

flexible sigmoidoscopy should therefore be first line (especially as she complains of fresh red bleeding, increasing the chance that this is a left-sided lesion). This would allow biopsy if a lesion is seen. If the flexible sigmoidoscopy is normal, a barium enema or CT colonography would be done.



[Q: 2017] OnExamination 2012 - Gastroenterology

Which of the following drugs does not undergo extensive hepatic first-pass metabolism?

- 1- Budesonide
- 2- Glyceryl trinitrate
- 3- Ketoconazole
- 4- Salbutamol
- 5- Warfarin

Answer & Comments

Answer: 5- Warfarin

The correct answer is warfarin.

The remaining listed drugs all undergo extensive hepatic first-pass metabolism.

reference:

Tofield C, Milson A, Chatu S. The hands-on guide to clinical pharmacology. Blackwell Publishing 2005.



[Q: 2018] OnExamination 2012 - Gastroenterology

Which of the following genotypes is associated with the lowest levels of alpha-1-antitrypsin (AAT)?

- 1- PiMM
- 2- PiMS
- 3- PiMZ
- 4- PiSZ
- 5- PiZZ

Answer & Comments

Answer: 5- PiZZ

PiMM is the normal phenotype.

The null phenotype (not in the list of options) is the least common but the most severe form of the disease where there is no detectable AAT in the serum.



[Q: 2019] OnExamination 2012 - Gastroenterology

Which of the following is an inhibitor of gastric acid secretion?

- 1- Acetylcholine
- 2- Histamine
- 3- Prostaglandins
- 4- Stomach distension
- 5- Swallowing

Answer & Comments

Answer: 3- Prostaglandins

The correct answer is prostaglandins.

The remaining listed options all stimulate the release of gastric acid.



[Q: 2020] OnExamination 2012 - Gastroenterology

A 61-year-old Caucasian patient presents to the gastroenterology clinic following a three month history of malaise with no other specific symptoms.

She had a hysterectomy in her 40s for symptomatic fibroids following completion of her family, and developed pre-eclampsia in both of her pregnancies. She is a current and lifelong smoker, takes no alcohol and previously worked as a secretary.

Present medication consists of Premarin 300 mcg OD, salbutamol PRN, Seretide BD and amlodipine 5 mg OD.

On examination the patient is pale with normal capillary refill time. The heart rate is 72, sinus rhythm. Blood pressure is 168/95 mmHg. Chest auscultation revealed neither crackles nor wheeze. Examination is otherwise unremarkable, with normal fundoscopy, urine dip and ECG.

Iron deficiency anaemia is seen on full blood count, and outpatient endoscopy is organised.

Which of the following is not a risk factor for the patient's pre-existent hypertension?

- 1- Hormone replacement therapy
- 2- Multiparity
- 3- Obstructive airway disease
- 4- Prior pre-eclampsia
- 5- Smoking

Answer & Comments

Answer: 3- Obstructive airway disease

This patient with iron deficiency anaemia presents with incidental hypertension, which may be multifactorial. Hypertension has classically been described in a male population, though relevant risk factors have been more recently identified in women.

These include

Multiple previous pregnancies

Menopause

Hysterectomy and

Hormone replacement therapy.

Though obstructive airway disease can cause pulmonary hypertension, and smoking is a well-recognised risk factor for arterial hypertension, in isolation it is not a cause of systemic hypertension.

Obstructive airway disease induced by familial α -1 antitrypsin deficiency is not associated with systemic hypertension.

Pre-eclampsia is a risk factor for consequent hypertension. Interestingly active smokers appear to have a lower incidence of pre-eclampsia.

Note that this patient takes unopposed oestrogen, which is safe in her case following hysterectomy though inadvisable in patients with an intact uterus due to the risk of endometrial carcinoma.

Reference:

NICE Clinical Guideline 34: Hypertension. National Institute for Health and Clinical Excellence, London (2006).

Wilson B et al. *BMJ* 2003; 326: 845 - 52: article on non-classical risk factors for hypertension.



[Q: 2021] OnExamination 2012 - Gastroenterology

A 71-year-old man presents to the Emergency department with acute severe abdominal pain and diarrhoea. He describes the pain as a dull ache across his abdomen.

He apparently underwent a bowel resection some four months earlier, and he has a history of ischaemic heart disease and two previous myocardial infarctions. He reports intermittent abdominal pain leading up to this latest event, which seemed to be worse if he had eaten a heavy meal.

On examination his BP is 100/55 mmHg, his pulse is 105 in atrial fibrillation (AF). His abdomen is generally tender, with sparse bowel sounds.

Investigations show

Hb 11.0 g/dl(13.5-18)

WCC $14.5 \times 10^9/L$ (4-11)

PLT $207 \times 10^9/L$ (150-400)

Na 139 mmol/l (135-146)

K 5.4 mmol/l (3.5-5)

Cr 172 mmol/l (79-118)

Amylase 450 U/l (60-180)

Lactate 4.2 mmol/l (0.5-2.2)

A plain abdominal film is unremarkable.

Which of the following is the most likely diagnosis?

- 1- Acute pancreatitis
- 2- Inflammatory colitis
- 3- Irritable bowel syndrome
- 4- Mesenteric ischaemia
- 5- Small bowel obstruction

Answer & Comments

Answer: 4- Mesenteric ischaemia

The history of ischaemic heart disease and presence of AF is suspicious for mesenteric ischaemia. Abdominal pain in the presence of a relatively normal x ray, diarrhoea, and a raised serum lactate add significantly to the suspicion.

CT scanning has become the imaging modality of choice for confirming the diagnosis, with a sensitivity and specificity for mesenteric ischaemia of over 90%.

Angiography is still used where the diagnosis is in doubt.



[Q: 2022] OnExamination 2012 - Gastroenterology

A 24-year-old man has returned a few days earlier from a Nile cruise.

He has begun suffering from profuse bloody diarrhoea. He opens his bowels several times per day, and there is blood and mucus mixed in with the motion each time. He is also complaining of dull abdominal pain.

There is no past medical history of note. On further questioning he admits to buying fruit from local stalls at the river side. On examination he is pyrexial 37.8°C, and has generalised lower abdominal tenderness.

Investigations show

Haemoglobin 12.1 g/dl(13.5-8)

White cell count $11.4 \times 10^9/L$ (4-10)

Platelets $204 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (134-143)

Potassium 3.9 mmol/l (3.5-5)

Creatinine 125 $\mu\text{mol/l}$ (60-120)

Stool Blood

White cells ++

Trophozoites

Which of the following is the most appropriate initial therapy?

- 1- IV cefotaxime
- 2- Oral ciprofloxacin
- 3- Oral diloxanide
- 4- Oral metronidazole
- 5- Supportive therapy only with fluid resuscitation

Answer & Comments

Answer: 4- Oral metronidazole

This man has amoebic dysentery which occurs around seven days after exposure to *Entamoeba histolytica*.

Acute amoebic dysentery is managed with a course of oral metronidazole or tinidazole, to be followed by a ten day course of diloxanide to eradicate colonisation of the gut.

With appropriate diagnosis and treatment, mortality from amoebiasis is less than 1%.

Amoebic liver abscess may appear at any time from eight weeks after infection, and presents with night sweats, anorexia and right upper quadrant pain.



[Q: 2023] OnExamination 2012 - Gastroenterology

A 20-year-old woman was referred for investigation of iron deficiency anaemia.

Her mother died aged 28 years from colonic carcinoma complicating Peutz-Jegher syndrome.

Which is the most likely mode of inheritance of Peutz-Jegher syndrome?

- 1- Autosomal dominant
- 2- Autosomal recessive
- 3- Mitochondrial
- 4- Polygenic
- 5- X linked dominant

Answer & Comments

Answer: 1- Autosomal dominant

Peutz-Jegher syndrome is a condition characterised by perioral pigmentation and numerous hamartomas of the bowel.

Originally it was assumed that these did not predispose to malignancy but studies now suggest the contrary.

The condition is autosomal dominant.



[Q: 2024] OnExamination 2012 - Gastroenterology

A 60-year-old lady has a six month history of abdominal discomfort, bloating and altered frequency in stools.

Her symptoms seem to be worse following a large meal where she also feels nausea. Clinical examination is normal. She is suspected of fulfilling the criteria for irritable bowel syndrome.

Which of the following investigations should be undertaken to exclude other diagnoses?

- 1- Anti-tissue transglutaminase (TTG) antibodies
- 2- Faecal occult blood
- 3- Faecal ova/parasite tests
- 4- Sigmoidoscopy
- 5- Thyroid function test

Answer & Comments

Answer: 1- Anti-tissue transglutaminase (TTG) antibodies

Patients who fulfil the diagnostic criteria for irritable bowel syndrome should be screened for other conditions with full blood count (FBC):

Erythrocyte sedimentation rate (ESR) (or plasma viscosity)

C reactive protein (CRP)

Anti-endomysial antibodies (EMA)

Tissue transglutaminase (TTG) antibodies.

The British Society of Gastroenterology (BSG) guidelines list other investigations that are not required:

Ultrasound

Rigid/flexible sigmoidoscopy

Colonoscopy

Barium enema

Thyroid function tests (TFTs)

Faecal ova/parasite tests

Faecal occult blood

Hydrogen breath test.



[Q: 2025] OnExamination 2012 - Gastroenterology

A 58-year-old man presents with a history of abdominal discomfort that is relieved by passing stool.

In the past month his stools have been looser in nature and he has had a feeling of urgency and incomplete evacuation. His symptoms seem to be worse with eating. He has also noticed that he has passed mucus per rectum.

He is overweight with a BMI of 28 kg/m². His weight has fallen. He says that he has adjusted his diet in the last six months.

Which of the following is the most appropriate diagnosis?

1- Colo-rectal carcinoma

2- Diverticulitis

3- Inflammatory bowel disease

4- Irritable bowel syndrome

5- Malabsorption

Answer & Comments

Answer: 1- Colo-rectal carcinoma

Weight loss, tenesmus and a recent change in bowel habit all point towards an underlying diagnosis of colorectal cancer. Onset of symptoms in later life and a relatively short duration (that is, weeks rather than years) also point towards a 'biological' cause rather than irritable bowel syndrome.

The passage of mucus per rectum is a normal physiological function and not indicative of underlying pathology.

The symptoms are not suggestive of malabsorption.

Diverticulitis and inflammatory bowel disease are both potential diagnoses but given the duration of symptoms less likely than a colonic neoplasm.



[Q: 2026] OnExamination 2012 - Gastroenterology

A 52-year-old male is admitted with vomiting and acute epigastric abdominal pain which radiates through to his back. Investigations confirm severe acute pancreatitis.

Which of the following figures most accurately reflect the mortality associated with severe acute pancreatitis?

1- Less than 5%

2- Approximately 10%

3- Approximately 20%

4- Approximately 30%

5- Approximately 40%

Answer & Comments

Answer: 3- Approximately 20%

Mortality in acute pancreatitis varies according to age, co-morbidities and severity and is scored through the Ranson scoring system.

However, average mortality has remained pretty much unchanged over the last two decades with severe disease and is approximately 20%.



[Q: 2027] OnExamination 2012 - Gastroenterology

A 50-year-old woman is seen in the clinic because of deranged liver function tests (LFTs).

She drinks at most 4 units of alcohol weekly.

On examination she is obese with a BMI of 45 kg/m² and her LFTs show:

ALT 140 U/L(5-40)

AST150 U/L(10-40)

Alkaline phosphatase 250 U/L(45-105)

Which of the following is the most likely cause of this derangement?

- 1- Diabetes mellitus
- 2- Drug induced
- 3- Hyperparathyroidism
- 4- Hypertension
- 5- Hypothyroidism

Answer & Comments

Answer: 1- Diabetes mellitus

Diabetes mellitus associated with obesity is the most likely cause of non-alcoholic fatty liver disease (NAFLD) in this patient. It is caused by fatty accumulation in the liver leading to inflammation.

Other causes of hepatitis need to be excluded before making this diagnosis.

Patients who are obese and diabetic are advised to lose weight and control their diabetes.

Usually, a low fat, low calorie diet is recommended alongside treatment to lower HbA1c.

Patients with NAFLD should avoid alcohol or other substances that could be harmful to the liver.



[Q: 2028] OnExamination 2012 - Gastroenterology

A 35-year-old obese Afro-Caribbean lady presents with mild jaundice. She claims to be a teetotaler and her BMI is 30 kg/m².

Investigations reveal the following results.

Haemoglobin 14 g/dL (11.5-16.5)

U+Es Normal

Bilirubin 25 µmol/L (1-22)

Aspartate transaminase 140 U/L (1-31)

Alanine transaminase 155 U/L (5-35)

Alkaline phosphatase 160 U/L (60-110)

Random blood glucose 11.2 mmol/L (3.0-6.0)

Hepatitis A IgG Positive

Hepatitis B and C screening Negative

Anti-nuclear antibodies 1:16 titre

Ultrasound abdomen reveals hyperechogenic hepatic parenchyma.

Liver biopsy reveals lesions suggestive of alcoholic liver disease.

On review of her notes, liver function tests performed six months previously showed similar values.

Which of the following is the most likely diagnosis?

- 1- Alcoholic liver disease
- 2- Autoimmune hepatitis

- 3- Non-alcoholic steatohepatitis
- 4- Primary biliary cirrhosis
- 5- Viral hepatitis

Answer & Comments

Answer: 3- Non-alcoholic steatohepatitis

This is a case of non-alcoholic steatohepatitis, the diagnosis of which is made only by histology of liver biopsy which shows lesions suggestive of ethanol intake in a patient known to consume less than 40g of alcohol per week.

The diagnosis is supported by the presence of obesity, hyperglycaemia and hyperechogenic hepatic parenchyma.

In alcoholic hepatitis, AST to ALT ratio is more than 1.



[Q: 2029] OnExamination 2012 - Gastroenterology

A 24-year-old woman has ingested an unknown quantity of paracetamol tablets four hours ago.

She now presents with nausea, vomiting, anorexia and right subchondral pain.

Which of the following features suggest that she should be transferred to the liver unit?

- 1- ALT 800 units/L
- 2- Blood glucose 5 mmol/L
- 3- Heart rate 120 BPM
- 4- pH 7.25
- 5- Systolic BP 100 mmHg

Answer & Comments

Answer: 4- pH 7.25

A pH of less than 7.3 is a poor prognostic factor for this patient.

The criteria for transfer to a specialist unit are:

Encephalopathy

INR >2.0 at <48h or >3.5 at <72h

Serum creatinine >200 mol/L

Blood pH <7.3

Systolic BP <80 mmHg.



[Q: 2030] OnExamination 2012 - Gastroenterology

A vegetarian woman had lunch at a Chinese buffet restaurant.

In the evening she presented with diarrhoea and vomiting. There was no fever.

Which of the following is the likely cause of food poisoning in her case?

- 1- Bacillus cereus
- 2- Clostridium perfringens
- 3- Escherichia coli
- 4- Salmonella typhimurium
- 5- Yersinia enterocolitica

Answer & Comments

Answer: 1- Bacillus cereus

Bacillus cereus food poisoning is the general description although two recognised types of illness are caused by two distinct metabolites. The diarrhoeal type of illness is caused by a large molecular weight protein, while the vomiting (emetic) type of illness is believed to be caused by a low molecular weight, heat-stable peptide.

The onset of watery diarrhoea, abdominal cramps, and pain occurs six to 15 hours after consumption of contaminated food. Symptoms usually persist for 24 hours.

The emetic type of food poisoning is characterised by nausea and vomiting within 0.5 to six hours after consumption of contaminated foods. Occasionally, abdominal cramps and/or diarrhoea may also occur. Duration of symptoms is generally less than 24 hours.

A wide variety of foods including meats, milk, vegetables, and fish have been associated with the diarrhoeal type food poisoning. The vomiting-type outbreaks have generally been associated with reheated rice in restaurants.

Clostridium perfringens is associated with meat and *Yersinia enterocolitica* with milk. *Salmonella* infection is associated with dairy, poultry and meat products.



[Q: 2031] OnExamination 2012 - Gastroenterology

A 55-year-old woman is referred by her GP with abnormal liver function tests.

She is overweight but otherwise well.

Liver biopsy is reported as showing evidence of non-alcoholic steatotic hepatitis (NASH).

Which of the following statements is correct concerning NASH?

- 1- Commoner in males than females
- 2- Has not shown improvement with pioglitazone
- 3- Is associated with insulin resistance
- 4- Is treated with urso-deoxycholic acid
- 5- The majority of patients will develop cirrhosis

Answer & Comments

Answer: 3- Is associated with insulin resistance

NASH is associated with increased prevalence of insulin resistance/type 2 diabetes.

Approximately 20% develop cirrhosis

It is more common in obese females and the treatment is weight reduction.

Data from small clinical trials using pioglitazone have shown modest improvement in liver biopsy appearance over one year.

Reference:

Seminars in Liver Disease 2001;21(1):17-26.



[Q: 2032] OnExamination 2012 - Gastroenterology

A 55-year-old male presents with dysphagia, retrosternal discomfort and weight loss. Studies reveal achalasia.

Which of the following is most likely to provide symptomatic relief?

- 1- Buscopan
- 2- Diazepam
- 3- Nifedipine
- 4- Omeprazole
- 5- Surgical cardiomyotomy

Answer & Comments

Answer: 5- Surgical cardiomyotomy

Both calcium channel blockers (nifedipine) and nitrates relax the lower oesophageal sphincter however the effect on symptoms is variable, short-lived and usually suboptimal. Use is frequently limited by adverse effects. Consequently medical therapy is typically limited to those patients too frail or unwilling to undergo definitive treatment or other therapies. Studies looking at the efficacy of medical therapies are typically small and uncontrolled which will tend to overestimate the benefit of an intervention. Study estimates of symptom improvement with medical therapy vary between 53-87% however none claim to achieve full symptom improvement. On the other hand pooled results from 5 studies of surgical procedures (Heller myotomy) show good to excellent symptom response in 82% of patients. Other studies of surgical techniques typically show symptom response rates of 84-100%. Benefit seems to persist for at least 16 months beyond this there may be some recurrence. Reflux is the most common side effect and a concomitant anti-reflux procedure (Nissen's fundoplication) may be performed. Botox applied to the lower oesophageal sphincter is a recent new therapy with good efficacy however its effects are

short lived (typically less than six months) and use is generally recommended to be restricted to the frail or elderly in whom more aggressive therapy poses high risk.

None of other choices help the symptoms.

Oesophageal dilatation is usually attempted before laparoscopic surgical myotomy.



[Q: 2033] OnExamination 2012 - Gastroenterology

A 25-year-old female presents with red crusted lesions around the mouth and finger pulps, three months after having had small bowel resection for Crohn's disease.

What is the most likely cause of her skin condition?

- 1- Nicotinamide deficiency
- 2- Pyridoxine deficiency
- 3- Thiamine deficiency
- 4- Vitamin B₁₂ deficiency
- 5- Zinc deficiency

Answer & Comments

Answer: 5- Zinc deficiency

Zinc deficiency can lead to acrodermatitis which presents with perioral dermatitis, acral involvement and sometimes alopecia.

The features of this patient who had bowel resection suggest zinc deficiency.



[Q: 2034] OnExamination 2012 - Gastroenterology

A 36-year-old man presents with a 16 week history of indigestion.

Five years previously he had been treated for a duodenal ulcer.

Investigations reveal:

Fasting gastrin 120 pmol/l (<55)

Which one of the following statements regarding gastrin is correct?

- 1- It acts upon the G cells of the stomach
- 2- It inhibits the secretion of pancreatic bicarbonate
- 3- It is produced by the alpha cells of the pancreatic islets
- 4- It is produced by the parietal cells of the stomach
- 5- Its release is stimulated by gastric luminal peptides

Answer & Comments

Answer: 5- Its release is stimulated by gastric luminal peptides

Gastrin is mainly produced in two forms by the G cells of the gastric antrum.

It stimulates the parietal cells to produce hydrochloric acid and its production is stimulated by neural reflex pathways and also by the direct effect of digested peptides on the G cells themselves.

It also stimulates the production of bicarbonate.



[Q: 2035] OnExamination 2012 - Gastroenterology

A 65-year-old male presents with a four month history of diarrhoea with pale stools and weight loss.

Relevant results show:

Calcium 1.8 mmol/L (2.2-2.6)

Alkaline phosphatase 350 U/L (45-105)

What is the most likely diagnosis?

- 1- Coeliac disease
- 2- Giardia lamblia infection
- 3- Pancreatic carcinoma
- 4- Small intestinal bacterial overgrowth
- 5- Whipple's disease

Answer & Comments

Answer: 3- Pancreatic carcinoma

The patient has a marked hypocalcaemia associated with malabsorption. The raised alkaline phosphatase may represent osteomalacia, pancreatic carcinoma in its own right, metastases or even biliary obstruction/disease.

In this age pancreatic carcinoma is the most probable diagnosis.

Coeliac disease very seldom causes such an increased alkaline phosphatase and is more likely to present with iron deficiency anaemia.

The villous atrophy caused by Giardia is very transient.

Whipple's is extremely rare, found in middle aged men and caused by a bacillus, *Tropheryma whippelii*.



[Q: 2036] OnExamination 2012 - Gastroenterology

A 23-year-old woman with type 1 diabetes (T1DM) of three years duration, presents for annual review with weight loss.

She had normal menstrual cycles and bowel habit was unchanged.

On examination her BMI was 23 kg/m² and investigations revealed a haemoglobin of 7 g/dL (11.5-16.5) and a MCV of 69 fL (80-96).

Which of the following is the most likely diagnosis?

- 1- Anorexia nervosa
- 2- Bacterial overgrowth
- 3- Beta-thalassaemia minor
- 4- Coeliac disease
- 5- Crohn's disease

Answer & Comments

Answer: 4- Coeliac disease

Coeliac disease is the likely option as this patient has autoimmune disease (T1DM), an iron deficiency anaemia and little in the way of symptoms.

Bacterial overgrowth is associated with profuse diarrhoea and a macrocytosis due to vitamin B₁₂ consumption.

Crohn's disease would be expected to be symptomatic.



[Q: 2037] OnExamination 2012 - Gastroenterology

With respect to liver cirrhosis, which of the following statements is correct?

- 1- Endothelin causes dilatation of the sinusoids, thus decreasing portal hypertension
- 2- In end-stage cirrhosis, liver transplantation is associated with 20% five year survival
- 3- The final common pathway of hepatic fibrosis is mediated by the hepatic stellate cell
- 4- Transforming growth factor is a potent promoter of the fibrogenic response by hepatocytes
- 5- Tumour necrosis factor is an anti-inflammatory effector in fibrotic liver injury

Answer & Comments

Answer: 3- The final common pathway of hepatic fibrosis is mediated by the hepatic stellate cell

The hepatic stellate cells, which reside in the space of Disse are central to the process of fibrosis within the liver.

Tumour necrosis factor-A is a pro-inflammatory effector in fibrotic liver injury, through activation of the stellate cells. These cells then secrete the fibrillar collagen, constituting the defining features of hepatic fibrosis.

Interleukin-10 is thought to exert anti-inflammatory effects on the stellate cell.

Endothelin is a vasoconstrictor in the hepatic sinusoids (similarly in the endothelium of the systemic circulation), and functions by causing contraction of the hepatic stellate cells, thus increasing intrahepatic sinusoidal resistance, and promoting portal hypertension.

Nitric oxide antagonises the effects of endothelin in the liver.

Five year survival after liver transplantation is now 75%.

Reference:

BMJ 2003;327:143-7.



[Q: 2038] OnExamination 2012 - Gastroenterology

A 52-year-old male is admitted with haematemesis and melaena.

Examination reveals that he is icteric, confused with a flapping tremor, has signs of chronic liver disease, a pulse rate of 110 bpm and blood pressure of 100/70 mmHg. Abdominal examination reveals ascites.

An urgent endoscopy reveals small oesophageal varices without evidence of bleeding, but an oozing portal hypertensive gastropathy.

Which of the following measures would be the most appropriate treatment for this patient?

- 1- Endoscopic banding
- 2- Endoscopic injection of adrenaline
- 3- Endoscopic injection of ethanolamine
- 4- Intravenous vitamin K
- 5- Oral propranolol

Answer & Comments

Answer: 2- Endoscopic injection of adrenaline

The endoscopy shows small varices with no evidence of bleeding but diffuse oozing of

blood. Hence endoscopic measures like banding for small varices will not be useful.

There is probably no evidence that vitamin K is helpful, as the coagulation is already likely to be deranged.

Oral propranolol is useful as a later prophylaxis of variceal bleed.



[Q: 2039] OnExamination 2012 - Gastroenterology

A 55-year-old woman presents with lethargy, diarrhoea together with joint pains and intermittent fever. These symptoms have developed over the last six months during which time she has lost 6 kg in weight.

Supraclavicular lymphadenopathy is noted.

What is the most likely diagnosis?

- 1- Bacillary dysentery
- 2- Campylobacter infection
- 3- Coeliac disease
- 4- Giardiasis
- 5- Whipple's disease

Answer & Comments

Answer: 5- Whipple's disease

Whipple's disease is caused by *Tropheryma whippelii* and symptoms include:

Chronic diarrhoea

Arthralgia

Pyrexia

Lymphadenopathy.

Diagnosis is by microscopy of jejunal biopsy specimen which shows macrophages with p-aminosalicylic acid (PAS) positive granules.

Treatment is co-trimoxazole.

Bacillary dysentery and *Campylobacter jejuni* infection are characterised by bloody diarrhoea and are not chronic.

Coeliac disease and giardiasis have no lymph involvement.



[Q: 2040] OnExamination 2012 - Gastroenterology

A 26-year-old woman is referred with intermittent diarrhoea present for a couple of years.

She states that her weight has been steady but describes watery motions up to six stools per day and has also noted abdominal discomfort with bloating. She has not been aware of any blood in the motions or melaena.

She describes no other medical history and denies taking any medication.

Investigations show:

Full blood count Normal

Urea and electrolytes Normal

Albumin 39 g/L(37-49)

Corrected Calcium 2.2 mmol/L(2.2-2.6)

Alkaline phosphatase 94 U/L(45-105)

C-reactive protein 6 mg/L(<10)

Prothrombin time 12 s(11.5-15.5)

What is the most likely diagnosis?

- 1- Crohn's disease
- 2- Intestinal tuberculosis
- 3- Small bowel bacterial overgrowth
- 4- Laxative abuse
- 5- Microscopic colitis

Answer & Comments

Answer: 4- Laxative abuse

The normal albumin and C-reactive protein level count against a diagnosis of inflammatory bowel disease (Crohn's or microscopic colitis) or an infection pathology such as intestinal tuberculosis. Whilst small bowel bacterial overgrowth does not typically produce a raised C-reactive protein level it is

very unusual in patients without risk factors for the condition (previous bowel surgery, Crohn's disease, motility disorders such as scleroderma).

This leaves laxative abuse as the most likely diagnosis. Laxative abuse, where not a function of chronic constipation, is usually closely linked to eating disorders (Bulimia and Anorexia) and as such is typically over-represented in young, female patients. Patients may well present to medical services and be referred on to secondary care with symptoms relating to overuse of laxative agents. They may well also deny abusing any medications on initial questioning.



[Q: 2041] OnExamination 2012 - Gastroenterology

A 60-year-old man presents with a five day history of lower abdominal pain and diarrhoea.

He has a history of chronic obstructive airways disease (COAD) and has had numerous acute infective exacerbations over the last three months.

On examination he was dehydrated, with a temperature of 38.6°C, a blood pressure of 102/72 mmHg and has a distended, tender abdomen.

Which of the following is the most appropriate investigation for this patient?

- 1- Chest x ray
- 2- Plain abdominal x ray
- 3- Sigmoidoscopy and biopsy
- 4- Stool microscopy
- 5- Ultrasound scan of the abdomen

Answer & Comments

Answer: 2- Plain abdominal x ray

This is pseudomembranous colitis due to *Clostridium difficile* secondary to antibiotic usage for his COAD.

Plain AXR is useful for diagnosing toxic dilatation and would be the investigation of choice here due to his abdominal distension, so toxic dilatation should be excluded prior to sigmoidoscopy. However it does not establish the diagnosis.

Stool microscopy has no value but stool toxin assay is useful.

A patient with diarrhoea normally has involvement of the distal colon and rectum, and sigmoidoscopy with biopsy is helpful for rapid diagnosis but should not be performed if toxic dilatation is suspected.

Patients with involvement of right colon usually have little or no diarrhoea.



[Q: 2042] OnExamination 2012 - Gastroenterology

A 47-year-old man presents with confusion and drowsiness.

A diagnosis of hepatic encephalopathy is suspected and treatment with lactulose is begun.

Which of the following concerning lactulose is true?

- 1- Absorbed from the gut
- 2- Causes hypermagnesaemia
- 3- Contraindicated in diabetes mellitus
- 4- Inhibits proliferation of ammonia-forming organisms in the gut
- 5- Reduces absorption of spironolactone

Answer & Comments

Answer: 4- Inhibits proliferation of ammonia-forming organisms in the gut

Lactulose, an osmotic laxative which causes hypomagnesaemia associated with diarrhoea, is not absorbed, does not affect the absorption of spironolactone and may be used in diabetics.

In the management of hepatic encephalopathy lactulose has a number of actions to help reduce gut ammonia 'production' and absorption, production of a more acidic colonic pH is key in this. These mechanisms are:

1. Conversion of lactulose of lactic acid acidifies the gut the lumen, this favours oxidation of NH_4^+ to NH_3 and the passage of NH_3 from tissues into the lumen (NH_4^+ moves into the lumen where it is oxidised to NH_3 and is trapped as it is not absorbable, further NH_4^+ then diffuses across) - that is, inhibiting absorption as NH_3 is not absorbable;
2. The acidic pH inhibits the proliferation of ammonia producing microbes and promotes colonisation by non-ammonia producing bacteria such as lactobacilli;
3. The laxative effect leads to an overall reduction in colonic bacterial load and reduction in the protein load absorbed from the gut.



[Q: 2043] OnExamination 2012 - Gastroenterology

A 42-year-old female presents with tiredness.

Her investigations reveal:

Haemoglobin 7.8 g/dL (11.5-16.5)

MCV 72 fL (80-96)

White cell count $7.6 \times 10^9/\text{L}$ (4-11 $\times 10^9$)

Platelet count $350 \times 10^9/\text{L}$ (150-400 $\times 10^9$)

Serum ferritin 8 $\mu\text{g}/\text{L}$ (15-300)

She was commenced on oral iron therapy and one month later her haemoglobin concentration was 8.0 g/dL (11.5-16.5).

What is the most likely cause of the failure of her haemoglobin to respond to this treatment?

- 1- Coeliac disease
- 2- Folate deficiency
- 3- Inadequate dosage of iron

4- Poor compliance with therapy

5- Haemolytic anaemia

Answer & Comments

Answer: 4- Poor compliance with therapy

The most likely explanation for the failure of an iron deficiency anaemia to respond to iron therapy in a menstruant female is poor compliance. Oral iron commonly causes gastrointestinal side effects which can limit adherence to therapy.

It is likely that the dose that this patient is prescribed would be adequate and if not some response would still be expected.

Folate deficiency and coeliac disease can give a megaloblastic anaemia with a raised mean corpuscular volume (MCV).

Similarly, haemolytic anaemia typically causes a raised MCV, due to reticulocyte formation.



[Q: 2044] OnExamination 2012 - Gastroenterology

A 65-year-old woman presented with a malabsorption syndrome.

She had a past history of radiotherapy for cervical cancer.

Small intestine biopsy reveals

Villous atrophy and crypt hypertrophy

Chronic inflammatory cell infiltrate of the lamina propria

together with Increase in intraepithelial lymphocytes.

What is the most likely diagnosis?

- 1- Bacterial overgrowth
- 2- Coeliac disease
- 3- Crohn's disease
- 4- Mesenteric ischaemia
- 5- Radiation enteropathy

Answer & Comments

Answer: 2- Coeliac disease

Do not be put off by the description of the case; these histological features are typical of coeliac disease with

Villous atrophy

Crypt hyperplasia/hypertrophy

Inflammatory infiltrate of the lamina propria and

Intra-epithelial lymphocytes.

Useful serology includes anti-TTG antibodies which would be expected in over 90% of cases.

Treatment of this case would therefore entail gluten-free diet.



[Q: 2045] OnExamination 2012 - Gastroenterology

A 65-year-old man is referred with abnormal liver function and undergoes a liver biopsy.

Which of the following count against hepatic cirrhosis?

- 1- Fibrous septa formation
- 2- Granuloma formation
- 3- Liver cell necrosis
- 4- Nodular regeneration
- 5- Subendothelial fibrosis

Answer & Comments

Answer: 2- Granuloma formation

Granuloma formation is not classically seen in cirrhosis, which can be micro- or macronodular in type.

In the micronodular form, the nodules are less than 3 mm across with uniform liver involvement - seen in alcohol or biliary disease.

In the macronodular form, there are larger nodules, classically seen in chronic viral hepatitis.



[Q: 2046] OnExamination 2012 - Gastroenterology

Which of the following cell types are linked with the substance they synthesise?

- 1- Gastric chief cells - intrinsic factor
- 2- Islet A cells - somatostatin
- 3- Islet B cells - amylin
- 4- Islet D cells - pancreatic polypeptide
- 5- Islet F cells - glucagon

Answer & Comments

Answer: 3- Islet B cells - amylin

Islet beta cells produce insulin and amylin, as well as C peptide, pro-insulin and gamma-aminobutyric acid (GABA).

Islet D cells produce somatostatin

F cells produce pancreatic polypeptide and

A cells produce glucagon

Gastric chief cells produce pepsinogen whilst

Gastric parietal cells produce acid and intrinsic factor.



[Q: 2047] OnExamination 2012 - Gastroenterology

A 58-year-old man with a longstanding history of alcohol excess has had an enlarging abdomen for several months.

On physical examination he has a non-tender abdomen with no masses palpable, but there is a fluid thrill. An abdominal ultrasound scan shows a large abdominal fluid collection with a small cirrhotic liver.

A chest x ray shows a globally enlarged heart.

Which of the following conditions is most likely to be present?

- 1- Dilated cardiomyopathy
- 2- Lymphocytic myocarditis
- 3- Myocardial amyloid deposition
- 4- Non-bacterial thrombotic endocarditis
- 5- Severe occlusive coronary atherosclerosis

Answer & Comments

Answer: 1- Dilated cardiomyopathy

This man has alcoholic liver cirrhosis with ascites.

The cardiomyopathy of alcoholism is a dilated or congestive form.



[Q: 2048] OnExamination 2012 - Gastroenterology

In the diarrhoea associated with cholera toxin, there is activation of which of the following enzyme systems?

- 1- Adenosine triphosphate (ATP).
- 2- Adenylate cyclase.
- 3- Guanylate cyclase.
- 4- Na-glucose co-transporter.
- 5- Na⁺/K⁺ ATPase pump.

Answer & Comments

Answer: 2- Adenylate cyclase.

Cholera toxin has two parts, A and B.

B binds while A activates G protein, which activates adenylate cyclase.

Elevated cyclic adenosine monophosphate (cAMP) results in unrestricted chloride secretion from villous crypts.



[Q: 2049] OnExamination 2012 - Gastroenterology

A 70-year-old man was admitted with pallor, light-headedness and loss of energy.

On the day prior to admission he had reported loose dark stools.

Examination revealed a pulse of 110 per minute and a blood pressure of 106/70 mmHg.

Investigations revealed:

Haemoglobin 7.2 g/dl(14-18)

MCV 72 fl(80-96)

White cell count $11.3 \times 10^9/L$ (4-11)

Platelet count $480 \times 10^9/L$ (150-400)

What is the most appropriate next step in his management?

- 1- Barium meal
- 2- Blood transfusion
- 3- Endoscopy
- 4- Parenteral iron infusion
- 5- Proton pump inhibitor therapy

Answer & Comments

Answer: 2- Blood transfusion

There is only one answer here and that is blood transfusion.

He has clearly had a major gastrointestinal (GI) bleed since he presents with symptoms of shock with a high resting heart rate and lowish blood pressure the day after what sounds like melaena. What is more he has a significant microcytic anaemia.

He should be resuscitated with blood transfusion and then sent for upper GI endoscopy.

A barium meal will not help a bleeding vessel.

Parenteral iron is for chronic anaemia not acute bleeds and proton pump inhibitors, although widely used, have no supportive evidence and are nowhere near as important as giving blood to this man.



[Q: 2050] OnExamination 2012 - Gastroenterology

A 40-year-old man has a history of left-sided Crohn's colitis.

Though previously treated with steroids and mesalazine, he has had several relapses in the past year. The last relapse, treated with high doses of steroids, was complicated by gastric bleeding.

Investigations show:

Haemoglobin 10.8 g/dL(13.0-18.0)

MCV 76 fL(80-96)

MCH 24 pg(28-32)

White cell count $10 \times 10^9/L$ (4-11 $\times 10^9$)

Platelets $400 \times 10^9/L$ (150-400 $\times 10^9$)

Serum total protein 70 g/L(61-76)

Serum albumin 30 g/L(37-49)

Serum CRP 30 mg/L(<10)

Abdominal x ray is normal.

Which of the following is the most appropriate management?

- 1- A trial of oral metronidazole for three months.
- 2- Total colectomy with ileostomy construction.
- 3- Total colectomy with pouch construction.
- 4- Treatment with azathioprine.
- 5- Treatment with oral budesonide.

Answer & Comments

Answer: 4- Treatment with azathioprine.

This patient has all the hallmarks of active Crohn's colitis that is failing to settle with first-line medical therapy.

The next step is a trial of azathioprine, which is used as a steroid-sparing agent. This is particularly relevant to this particular patient, as he has had a serious side-effect from previous steroid treatment.

Metronidazole is rarely effective in the treatment of active Crohn's colitis.

Given that Crohn's disease can recur following surgery, an operation should not be embarked upon without first a trial of the second-line medical therapies such as azathioprine, its metabolite 5-mercaptopurine, or infliximab.



[Q: 2051] OnExamination 2012 - Gastroenterology

A 55-year-old man on no current treatment for his quiescent ulcerative colitis (UC) is found to have an ESR of 95 mm/hr (0-20mm/1st hour).

Investigations show:

Haemoglobin 13.2g/dL(13.0-18.0)

WCC $4.5 \times 10^9/L$ (4-11)

Platelets $160 \times 10^9/L$ (150-400)

Corrected Calcium 2.58 mmol/L(2.2-2.6)

IgG 25g/L(6-13)

IgA 1.8g/L(0.8-3.0)

IgM 1.6g/L(0.4-2.2)

What is the most appropriate next investigation?

- 1- Bone marrow trephine and aspiration.
- 2- Isotope bone scan.
- 3- Plasma immunoelectrophoresis.
- 4- Rectal biopsy.
- 5- x Ray skeletal survey.

Answer & Comments

Answer: 3- Plasma immunoelectrophoresis.

The erythrocyte sedimentation rate (ESR) is not raised in quiescent UC. Hence there must be another reason in this case.

The only abnormal result given is a raised IgG. This suggests that myeloma is the diagnosis.

Plasma immunoelectrophoresis to look for an M band is the most appropriate next investigation.

A bone marrow trephine is the definitive investigation but is traumatic and painful to the patient and so is not the next investigation of choice.



[Q: 2052] OnExamination 2012 - Gastroenterology

A 40-year-old single man returned from holiday in Europe with mild bloody diarrhoea which had lasted for two weeks.

He had lost 2.5 kg in weight, had occasional lower abdominal cramping discomfort and a painful swelling of his left knee.

What is the most likely diagnosis?

- 1- Amoebiasis
- 2- Campylobacter infection
- 3- Crohn's disease
- 4- Gonococcal septicaemia
- 5- Ulcerative colitis

Answer & Comments

Answer: 2- Campylobacter infection

Campylobacter infection is one of the commonest causes of inflammatory diarrhoea. Abdominal pain is often a prominent feature of the illness frequently localising to the right iliac fossa. Diarrhoea may be mild or very severe often with passage of blood. Symptoms may last a week or longer.

Reactive arthritis and Reiter's syndrome can develop following infection with a number of enteric pathogens including Shigella, Salmonella, Campylobacter and Yersinia.



[Q: 2053] OnExamination 2012 - Gastroenterology

A 58-year-old man complains of tiredness, fever, weight loss, arthralgia and diarrhoea.

Jejunal biopsy reveals flattened mucosa containing periodic acid-Schiff (PAS) positive macrophages.

What is the most likely diagnosis?

- 1- Coeliac disease
- 2- Parasitic infection
- 3- Tropical sprue
- 4- Tuberculosis
- 5- Whipple's disease

Answer & Comments

Answer: 5- Whipple's disease

Whipple's disease is rare and affects most commonly middle-aged males.

It can affect any organ, but dominated by involvement of small bowel, causing malabsorption.

The organism (*Tropheryma whippelii*) can be identified both between and within abnormal macrophages which stain magenta with PAS.

Treatment is with prolonged antibiotics, for example, parenteral penicillin and streptomycin for two weeks, followed by one year of doxycycline.



[Q: 2054] OnExamination 2012 - Gastroenterology

A 32-year-old man develops profuse diarrhoea with mucus and blood.

Biopsies from the flexible sigmoidoscopy shows evidence of ulcerative colitis.

Which of the following is true of the condition?

- 1- Colectomy may worsen gall bladder disease
- 2- Goblet cells are unaffected in the mucosa
- 3- Mesalazine therapy is associated with infertility in males
- 4- Pseudopolyps on sigmoidoscopic examination have premalignant potential

- 5- Topical 5-aminosalicylic acid is less effective than topical steroids in proctitis

Answer & Comments

Answer: 1- Colectomy may worsen gall bladder disease

Mesalazine is 5-aminosalicylic acid.

Sulphasalazine is the combination of 5-ASA and sulphapyridine, the latter being a sulphonamide and causing oligospermia.

Pseudopolyps are not premalignant and may occasionally regress.

Topical 5-aminosalicylic acid is as effective as topical steroids in proctitis.

Goblet cells are depleted in the mucosa.



[Q: 2055] OnExamination 2012 - Gastroenterology

A 35-year-old man is referred to the gastroenterology clinic with persistent pain in the rectum. The patient reports recurrent painful oral ulcers.

On direct questioning he admits to red and painful eyes. He also reports he has recently noticed an ulcer over his scrotum.

On examination there is evidence of oral aphthous ulceration; abdominal examination reveals tenderness in the right iliac fossa and a bruit on auscultation of the abdomen. Rectal examination demonstrates perianal ulceration.

What is the most likely diagnosis?

- 1- Behçet's syndrome
- 2- Crohn's disease
- 3- HIV infection
- 4- Syphilis
- 5- Tuberculosis

Answer & Comments

Answer: 1- Behçet's syndrome

Behçet's syndrome is a vasculitis of unknown pathophysiology.

Onset of disease is typically in the third and fourth decades. It is more common in men in the Middle East and women in the Far East.

Diagnostic criteria include oral aphthous ulcers which are painful, recurrent and non-scarring and two of:

Genital ulceration

Uveitis

Pustular vasculitis and synovitis

Meningoencephalitis

And the exclusion of inflammatory bowel disease, systemic lupus erythematosus, Reiter's syndrome and Herpes.

Aphthoid ulcers can occur anywhere in the gastrointestinal tract but are most commonly found in the ileo-caecal region, right colon and oesophagus.⁵

The presence of genital ulcers and the absence of significant bowel symptoms both go against a diagnosis of Crohn's disease, rather than the presence of an abdominal bruit which is a rare finding in vasculitis.⁶

Reference:

Bloom S, Webster G, Oxford Handbook of Gastroenterology and Hepatology, Oxford University Press 2006.

Travis SPL, Ahmad T, Collier J, Steinhart AH. Pocket Consultant Gastroenterology. Blackwell Publishing 2005.



[Q: 2056] OnExamination 2012 - Gastroenterology

A 21-year-old woman is referred from the Emergency department with a paracetamol overdose.

Which of the following is an indication for liver transplantation in acute liver failure as a result of paracetamol overdose?

1- Arterial pH < 7.35

2- Bilirubin > 200 micromol/L

3- Creatinine > 250 micromol/L

4- Grade I encephalopathy

5- Prothrombin time > 100 seconds (INR > 6.7)

Answer & Comments

Answer: 5- Prothrombin time > 100 seconds (INR > 6.7)

Prothrombin time > 100 seconds in acute liver failure with paracetamol poisoning is one of the selection criteria for liver transplantation.⁵

The remainder of the selection criteria for liver transplantation in acute liver failure with paracetamol overdose are as follows:

Arterial pH < 7.3 (this needs to be interpreted with caution as pH may improve with N-acetylcysteine and rehydration)

Creatinine > 300 micromol/L

Grade III or grade IV encephalopathy.

Serum bilirubin > 300 micromol/L is part of the selection criteria for liver transplantation in non-paracetamol induced acute liver failure.⁵

There are a variety of complications with liver transplantation such as

Immunological rejection

Effects of immunosuppressive drugs used

Infection and

Disease recurrence.⁵

Reference:

Bloom S, Webster G, Oxford Handbook of Gastroenterology and Hepatology, Oxford University Press 2006.



[Q: 2057] OnExamination 2012 -
Gastroenterology

A 28-year-old woman is referred by her GP to the gastroenterology clinic after a recent gastroscopy with duodenal biopsies confirmed the diagnosis of coeliac disease.

What is the prevalence of coeliac disease in Europe?

- 1- 1:10
- 2- 1:30
- 3- 1:300
- 4- 1:1000
- 5- 1:3000

Answer & Comments

Answer: 3- 1:300

The prevalence of coeliac disease in Europe varies widely and is in the region of between 1:100 and 1:300. It is more common in the Celtic population⁵.

Coeliac disease is caused by a T cell mediated hypersensitivity reaction to gluten which causes intestinal inflammation and atrophy. It presents at any age but in adults the commonest age of presentation is 20s and 30s. Women are slightly more commonly affected.⁵

Patients usually have diarrhoea and steatorrhoea may be present. There is often a mild macrocytic anaemia with low folate. Classically iron or folate deficiency is seen.⁵

Ten per cent to 15% of patients have abnormal liver function tests. Patients may also have thrombocytosis. Low corrected calcium, vitamin D and zinc are also seen.⁵

IgA anti-endomysial and anti-tissue transglutaminase antibodies are useful serological tests. Anti-endomysial antibodies are 90% sensitive and almost 100% specific. Biopsies from the second part of the

duodenum are essential and demonstrate villous atrophy.⁵

Management includes a gluten-free diet - patients should avoid wheat, barley and rye.⁵

Reference:

Bloom S, Webster G, Oxford Handbook of Gastroenterology and Hepatology, Oxford University Press 2006.



[Q: 2058] OnExamination 2012 -
Gastroenterology

A 34-year-old woman is referred to the gastroenterology clinic. The GP referral letter states the patient has persistent lethargy and blood results have demonstrated iron deficiency anaemia.

Which of the following statements regarding iron deficiency anaemia is correct?

- 1- Endomysial antibody serology to investigate for coeliac disease should always be requested in addition to duodenal biopsies
- 2- Low serum iron with a low total iron-binding capacity confirms iron deficiency
- 3- Microcytosis may be absent where there is combined iron and folate deficiency
- 4- The presence of Howell-Jolly bodies on blood film would go against coeliac disease
- 5- Thrombocytosis indicates chronic blood loss

Answer & Comments

Answer: 3- Microcytosis may be absent where there is combined iron and folate deficiency

Distal duodenal (D2) biopsies should be taken in any patient with iron deficiency anaemia undergoing a gastroscopy as 2-3% of patients will have coeliac disease.⁶

Endomysial antibody serology can be useful to confirm that subtotal villous atrophy found at histology is not due to another cause.

Antibody titres help to determine whether or not the patient is adhering to a gluten free diet.

In the investigation of iron deficiency anaemia serology for coeliac disease would be performed prior to an OGD.

Low serum iron (< 10 pmol/L) with a high total iron-binding capacity (> 70 pmol/L) confirms iron deficiency⁶.

Howell-Jolly bodies on blood film indicate hyposplenism and are consistent with a diagnosis of coeliac disease⁶.

Thrombocytosis may occur in acute haemorrhage but is also found in a number of other situations such as inflammatory conditions⁶.

Reference:

Travis SPL, Ahmad T, Collier J, Steinhart AH. *Pocket Consultant Gastroenterology*. Blackwell Publishing 2005.



[Q: 2059] OnExamination 2012 - Gastroenterology

A 48-year-old man presents with haematemesis and melaena. He admits to high alcohol intake.

On examination he is shocked, his heart rate is 110 beats per minute and blood pressure is 92/74 mmHg. There is evidence of leukonychia and abdominal examination reveals tenderness in the epigastrium.

What is the most likely underlying cause of the gastrointestinal haemorrhage?

- 1- Gastric antral vascular ectasia (GAVE)
- 2- Gastro-oesophageal varices
- 3- Mallory-Weiss tear
- 4- Peptic ulceration
- 5- Portal hypertensive gastropathy

Answer & Comments

Answer: 4- Peptic ulceration

Peptic ulceration is the commonest cause of acute upper gastrointestinal (GI) haemorrhage⁵.

Epigastric tenderness also points towards peptic ulcer disease. The history of high alcohol intake can be misleading in directing the candidate towards varices.

In this case the answer is the most common cause of an acute upper GI bleed which is peptic ulceration - 25-50% of cases of non-variceal upper GI bleeding and 5% of cases of upper GI haemorrhage are due to varices⁵.

Gastric antral vascular ectasia is a relatively uncommon condition. It typically presents as a cause of iron-deficiency anaemia as a result of chronic GI blood loss. Overt symptoms of upper GI haemorrhage may be precipitated by administration of anti-platelet agents or anti-coagulants. The mean age of diagnosis is around 70 and there is an association with scleroderma.

Portal hypertensive gastropathy is a poorly understood complication of portal hypertension (usually as a result of chronic liver disease). There is a typical mosaic or snakeskin like appearance to the gastric mucosa which, with increasing severity of the condition, can develop vascular ectasia and become very friable. Typical presentation is with chronic GI blood loss but acute haemorrhage may occur.

Reference:

Bloom S, Webster G, *Oxford Handbook of Gastroenterology and Hepatology*, Oxford University Press 2006.



[Q: 2060] OnExamination 2012 - Gastroenterology

A 71-year-old woman comes to the clinic for advice.

Over the course of the past year or two she has had increasing problems with regurgitation of rotten food, has lost weight and acquired a chronic cough. According to

her partner she has problems with halitosis which have not improved on multiple visits to the dentist.

On examination her BP is 145/82 mmHg, pulse is 70 and regular and her BMI is 27. She has a neck mass which appears to gurgle when she swallows.

Investigations show:

Haemoglobin 13.2 g/dl(11.5-16.0)

White cell count $7.3 \times 10^9/L$ (4-11)

Platelets $161 \times 10^9/L$ (150-400)

Sodium 141 mmol/l (135-146)

Potassium 4.0 mmol/l (3.5-5)

Creatinine 95 micromol/l (79-118)

Which of the following is the most likely diagnosis?

- 1- Achalasia
- 2- Gastro-oesophageal reflux disease (GORD)
- 3- Oesophageal carcinoma
- 4- Pharyngeal pouch
- 5- Plummer-Vinson's disease

Answer & Comments

Answer: 4- Pharyngeal pouch

The history of regurgitation of rotten food, coupled with chronic cough and a gurgling mass on examination fits best with a pharyngeal pouch. Aspiration of food from the pouch may lead in some cases to pneumonia. Management involves either diverticulectomy for larger lesions, or Dohlman's procedure for smaller pouches.

Whilst GORD is possible alternative diagnosis, a pouch would not be found on examination.

Achalasia is usually associated with progressive dysphagia to both liquids and solids, oesophageal carcinoma with progressive dysphagia first to solids then liquids.

Plummer-Vinson's disease is associated with progressive dysphagia due to oesophageal webs.



[Q: 2061] OnExamination 2012 - Gastroenterology

A 39-year-old man who is known to drink three bottles of wine per day presents to the Emergency department with dull abdominal pain. He tells you that he has suffered from increasing abdominal swelling over the past month.

On examination his BP is 105/72 mmHg, his pulse is 92 and regular. He is pyrexial 37.9°C. His abdomen is generally tender but there are bowel sounds on auscultation. He is penicillin allergic.

Investigations show:

Haemoglobin 10.5 g/dl(13.5-17.7)

White cell count $11.5 \times 10^9/L$ (4-11)

Platelets $125 \times 10^9/L$ (150-400)

Sodium 134 mmol/l (135-146)

Potassium 3.6 mmol/l (3.5-5)

Creatinine 90 $\mu\text{mol/l}$ (79-118)

280 neutrophils / ml in ascitic fluid(<250)

Which of the following is the most appropriate treatment?

- 1- Ciprofloxacin and vancomycin
- 2- Co-amoxiclav
- 3- Erythromycin and ciprofloxacin
- 4- Erythromycin and metronidazole
- 5- Piperacillin and tazobactam

Answer & Comments

Answer: 1- Ciprofloxacin and vancomycin

The diagnosis here is spontaneous bacterial peritonitis - note the history of alcohol excess, gradually increasing abdominal girth and elevated neutrophil count in the ascitic fluid. Spontaneous bacterial peritonitis should be

managed aggressively, and whilst piperacillin and tazobactam are an appropriate choice in those who are not penicillin allergic, in this case ciprofloxacin and vancomycin are the default choice due to the presence of penicillin allergy. Oral continuation therapy is with ciprofloxacin alone or co-trimoxazole.

Co-amoxiclav is not appropriate due to the presence of penicillin allergy, nor is the piperacillin and tazobactam combination.

The two erythromycin combinations do not provide an adequate breadth of coverage.



[Q: 2062] OnExamination 2012 - Gastroenterology

Which of the following drugs is a recognised cause of pancreatitis?

- 1- Alendronic acid
- 2- Amiodarone
- 3- Amitriptyline
- 4- Atenolol
- 5- Azathioprine

Answer & Comments

Answer: 5- Azathioprine

The correct answer is azathioprine.

The remaining listed options are not known to cause pancreatitis.

Reference:

Tofield C, Milson A, Chatu S. *The hands-on guide to clinical pharmacology*. Blackwell Publishing 2005.



[Q: 2063] OnExamination 2012 - Gastroenterology

Which of the following is a cause of macroglossia?

- 1- Amyloidosis
- 2- Crohn's disease
- 3- Glossitis

4- Peutz-Jeghers syndrome

5- Tuberous sclerosis

Answer & Comments

Answer: 1- Amyloidosis

Crohn's disease can affect any part of the gastrointestinal tract from the mouth to the anus. Aphthous ulceration is common in active disease.⁹

Aphthous ulcers³ and glossitis² are both features of coeliac disease.

Patients with Peutz-Jeghers syndrome have characteristic mucocutaneous pigmentation², that is, perioral freckling.

Gingival fibromas are seen in tuberous sclerosis.



[Q: 2064] OnExamination 2012 - Gastroenterology

Which of the following is a cause of primary iron overload?

- 1- Alcoholic liver disease
- 2- Aplastic anaemia
- 3- Haemochromatosis
- 4- Insulin resistance syndrome
- 5- Repeated blood transfusions

Answer & Comments

Answer: 3- Haemochromatosis

Haemochromatosis is the correct answer.

The remaining options are all associated with secondary iron overload.

Iron overload secondary to repeated blood transfusion is a particular problem for patients with hereditary anaemia, and can be a major cause of morbidity.

The association between the metabolic syndrome (insulin resistance, obesity,

hyperlipidaemia) and the development of hepatic iron overload has been described on a number of occasions over the last couple of decades. These patients are usually middle-aged men with mild to moderate iron excess. It is thought compound heterozygosity for the HFE mutations (C282Y and H63D) may have a role, but the link is not yet fully understood.

Aplastic anaemia is often associated with chronic haemolysis, and repeated blood transfusions, both of which are linked with iron overload.

Following heavy alcohol intake, hepatocytes may lose their ability to compensate for inborn errors in iron metabolism, resulting in iron overload. The link between iron and alcohol is further demonstrated by the fact that alcohol increases the severity of liver damage in hereditary haemochromatosis.

Reference:

Travis SPL, Ahmad T, Collier J, Steinhart AH. *Pocket Consultant Gastroenterology*. Blackwell Publishing 2005.

Review article: *alcoholic liver disease - pathophysiological aspects and risk factors*. Gramenzi A et al. *Aliment Pharmacol Ther* 24, 1151-116.



[Q: 2065] OnExamination 2012 - Gastroenterology

Which of the following drugs is a P450 hepatic enzyme inducer?

- 1- Ciprofloxacin
- 2- Erythromycin
- 3- Ketoconazole
- 4- Phenobarbitone
- 5- Sodium valproate

Answer & Comments

Answer: 4- Phenobarbitone

The correct answer is phenobarbitone.

The remainder of the listed options are all inhibitors of cytochrome P450.

Reference:

Tofield C, Milson A, Chatu S. *The hands-on guide to clinical pharmacology*. Blackwell Publishing 2005.



[Q: 2066] OnExamination 2012 - Gastroenterology

A 22-year-old man has been admitted with severe ulcerative colitis.

He has been on high-dose steroids intravenously for three days but there have been no signs of improvement.

The gastroenterology team have decided to commence ciclosporin.

Which of the following is a recognised adverse effect of ciclosporin?

- 1- Eczema
- 2- Hypertension
- 3- Nephrotic syndrome
- 4- Psoriasis
- 5- Rheumatoid arthritis

Answer & Comments

Answer: 2- Hypertension

The correct answer is hypertension.

The remainder are all indications for ciclosporin use - in cases of eczema, psoriasis and rheumatoid arthritis patients will have severe disease.

Cyclosporine also results in nephrotoxicity.

Gum hypertrophy, hirsutism and convulsions are rare adverse reactions.

Reference:

Tofield C, Milson A, Chatu S. *The hands-on guide to clinical pharmacology*. Blackwell Publishing 2005.



[Q: 2067] OnExamination 2012 -
Gastroenterology

Which of the following demonstrates autosomal dominant inheritance?

- 1- Acute intermittent porphyria
- 2- Cystic fibrosis
- 3- Dubin-Johnson syndrome
- 4- Haemochromatosis
- 5- Wilson's disease

Answer & Comments

Answer: 1- Acute intermittent porphyria

Cystic fibrosis is an autosomal recessive disease, where mutations in the gene for the CFTR (cystic fibrosis transmembrane conductance regulator) results in the production of dry protein-rich secretions leading to pulmonary and gastrointestinal complications.

Dubin-Johnson syndrome is a rare autosomal recessive disorder where there is conjugated hyperbilirubinaemia and impaired bilirubin excretion resulting in mild jaundice but normal liver function.

Haemochromatosis demonstrates autosomal recessive inheritance where iron overload can lead to cirrhosis. Other systems are also affected and patients may suffer from

Cardiomyopathy

Diabetes mellitus

Hypogonadism

Skin pigmentation ('bronze diabetes') and

Arthropathy.

Wilson's disease is an autosomal recessive disorder caused by copper retention and impaired incorporation of copper into caeruloplasmin. Patients may develop acute liver failure, and the disease is also a cause of cirrhosis. There may be neuropsychiatric

manifestations such as parkinsonism and cognitive impairment.

Reference:

Bloom S, Webster G, Oxford Handbook of Gastroenterology and Hepatology, Oxford University Press 2006.



[Q: 2068] OnExamination 2012 -
Gastroenterology

From where is the hormone somatostatin released?

- 1- Duodenum
- 2- Jejunum
- 3- Liver
- 4- Pancreas
- 5- Stomach

Answer & Comments

Answer: 4- Pancreas

Somatostatin is released from delta cells in the pancreas and is a strong inhibitor of insulin and glucagon secretion.

Reference:

Kelly C, Flatt PR, McClenaghan NH. Cell-to-cell communication and cellular environment alter the somatostatin status of delta cells.



[Q: 2069] OnExamination 2012 -
Gastroenterology

Which of the following features seen on barium studies is typical of both ulcerative colitis and Crohn's disease?

- 1- Cobblestone mucosa
- 2- Pseudopolyps
- 3- Rose-thorn ulcers
- 4- Skip lesions
- 5- Strictures

Answer & Comments

Answer: 2- Pseudopolyps

Pseudopolyps are seen in both ulcerative colitis and Crohn's disease.

The remainder of options listed tend to be features of Crohn's disease rather than ulcerative colitis.

Reference:

Travis SPL, Ahmad T, Collier J, Steinhart AH. *Pocket Consultant Gastroenterology*. Blackwell Publishing 2005.



[Q: 2070] OnExamination 2012 - Gastroenterology

A 21-year-old man was admitted with confusion.

He was noted to have Kayser-Fleischer rings and his liver function tests were consistent with acute hepatitis.

Which chromosome contains the gene for this disease?

- 1- Chromosome 6
- 2- Chromosome 13
- 3- Chromosome 15
- 4- Chromosome 17
- 5- Chromosome 22

Answer & Comments

Answer: 2- Chromosome 13

The gene involved in Wilson's disease is located on chromosome 13.

Wilson's disease is an autosomal recessive disorder which results in copper deposition in the liver and brain and impaired incorporation of copper into caeruloplasmin.

Wilson's disease is a cause of acute liver failure and can also lead to decompensated cirrhosis.

Patients with neurological disease often have Kayser-Fleischer rings.

In the majority of patients plasma caeruloplasmin is low (< 200 mg/L); serum

copper is < 11 µmol/L and in 65% of patients 24 hour urinary copper is elevated at > 3 µmol.

Liver biopsy will aid the diagnosis.

Treatment includes penicillamine which leads to urinary copper excretion.

Ninety per cent of cases of haemochromatosis are caused by the substitution of tyrosine for cysteine at position 282 of the HFE gene found on chromosome 6.

Marfan's syndrome is caused by defects in fibrillin; the gene responsible is located on chromosome 15.

Neurofibromatosis type 1 is due to a mutation or deletion of the NF1 gene located on chromosome 17.

Neurofibromatosis type 2 is the result of a mutation or deletion of the NF2 gene found on chromosome 22.



[Q: 2071] OnExamination 2012 - Gastroenterology

A 42-year-old man presents with a six month history of diarrhoea and abdominal cramps. On further questioning it appears he has also noticed facial flushing.

On examination there is wheeze on auscultation of his chest and abdominal examination reveals hepatomegaly.

Which of the following investigations would confirm the likely diagnosis?

- 1- 24-hour urinary 5-HIAA
- 2- 24-hour urinary copper
- 3- 24-hour urinary free cortisol
- 4- 24-hour urinary protein
- 5- 24-hour urinary VMA

Answer & Comments

Answer: 1- 24-hour urinary 5-HIAA

This patient has carcinoid syndrome. The diagnosis is made by 24-hour urine collection for 5-hydroxyindoleacetic acid (5-HIAA) - excretion is greater than 0.3 mmol.

Forty five per cent of carcinoid tumours arise in the appendix, 30% arise in the small bowel and 20% in the rectum.

Most patients with carcinoid syndrome have liver metastases.

5-HT, kinins, prostaglandins and other vasoactive substances are secreted.

Clinical features of carcinoid syndrome include diarrhoea and abdominal cramps in the majority of patients.

Flushing, which is often provoked by alcohol, bronchoconstriction and cardiac involvement with tricuspid or pulmonary incompetence are also features.

Diagnosis also includes chest x ray, abdominal ultrasound scan, small bowel radiology and echocardiography to establish the extent of disease. Surgical resection of the primary tumour is possible in some cases; octreotide is the treatment of choice.

In the majority of cases of Wilson's disease 24-hour urinary copper is greater than 3 µmol.

In Cushing's syndrome 24-hour urinary free cortisol is elevated.

Nephrotic syndrome is defined as proteinuria greater than 3.5 g/1.75 m² of body surface per 24 hours, hypoalbuminaemia and oedema.

Screening for pheochromocytoma can be performed by 24-hour urine collection for 4-OH-3-methoxymandelate (HMMA, VMA).



[Q: 2072] OnExamination 2012 - Gastroenterology

A 37-year-old woman gives an eight month history of bloody diarrhoea. On average she has six bowel motions per day with associated

urgency. She also reports weight loss of approximately 3 kg.

On examination she is dehydrated and tachycardic. There is evidence of pallor and abdominal examination reveals left-sided tenderness.

Which of the following pathological features would you expect to find given the likely underlying diagnosis?

- 1- Diffuse mucosal inflammation
- 2- Lymphoid aggregates
- 3- Normal crypt architecture
- 4- Presence of goblet cells
- 5- Transmural inflammation

Answer & Comments

Answer: 1- Diffuse mucosal inflammation

Chronic (particularly for this duration) bloody diarrhoea in a young patient is very suggestive of a diagnosis of ulcerative colitis. The time course is too long for an infective cause and whilst Crohn's may cause a colitis this is less frequent. Bloody diarrhoea occurs in 90-100% of cases of UC. Crohn's disease often presents with intermittent abdominal pain, diarrhoea is usually watery and in half of cases presentation is with perianal disease. Bloody diarrhoea may be a feature of Crohn's colitis but this is less common than UC. The predominant left sided symptoms (urgency and anatomical distribution of the tendency) should also point towards UC.

The answer here therefore is diffuse mucosal inflammation, all the remaining options are histological features of Crohn's disease. Mucosal inflammation is one of the histological findings in UC - transmural inflammation is seen in Crohn's disease.

Lymphocytes are seen in Crohn's disease, whereas neutrophils are found in UC.

Crypt abscesses and goblet cell depletion are also found in UC.

Reference:

Firth JD, Keshav SC, Atkinson RJ, Hirschfield GM, Leeds JS, Medical Masterclass Gastroenterology and Hepatology, Royal College of Physicians of London 2008.

Travis SPL, Ahmad T, Collier J, Steinhart AH. Pocket Consultant Gastroenterology. Blackwell Publishing 2005.



[Q: 2073] OnExamination 2012 - Gastroenterology

A 42-year-old man with a history of ulcerative colitis (UC) comes to the gastroenterology clinic. He currently takes mesalazine and has quiescent disease. He has had three episodes of severe disease, the last one some two years ago.

On examination he looks well, his BP is 115/72 mmHg, his pulse is 75 and regular, and his BMI is 23. His abdomen is soft and non-tender.

Investigations show:

Haemoglobin 13.0 g/dl(13.5-17.7)

White cells $7.8 \times 10^9/L$ (4-11)

Platelets $189 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 4.4 mmol/l (3.5-5)

Creatinine 95 $\mu\text{mol/l}$ (79-118)

Albumin 40 g/l (35-50)

Alanine aminotransferase 35 U/l (5-40)

He asks questions about his UC and risk of colonic malignancy with respect to his UC.

Which of the following features would give you most cause for concern?

- 1- Disease confined to the rectum only
- 2- Disease duration of six years
- 3- Disease throughout the colon
- 4- No signs of primary sclerosing cholangitis
- 5- Three episodes of severe disease flare ups

Answer & Comments

Answer: 3- Disease throughout the colon

Out of these factors, pancolitis would give most cause for concern with respect to risk of colonic malignancy. The relative risk for colonic carcinoma versus the general population is 14.8 for pancolitis, versus 1.7 for distal disease only.

Other features of concern in patients with UC include:

Primary sclerosing cholangitis

Presence of dysplastic lesions within the colon

Prolonged disease (8-10 years after diagnosis or more).

High-grade dysplasia or carcinoma necessitates colectomy, while many also recommend colectomy in patients with low-grade dysplasia.



[Q: 2074] OnExamination 2012 - Gastroenterology

A 19-year-old woman returns from her gap year travels with chronic low grade fever, intermittent abdominal pain and diarrhoea. She has been feeling unwell for the past months and has returned to the UK because she has begun to lose weight. Her only medication is the combined oral contraceptive pill.

On examination she looks pale, her BP is 110/60 mmHg, pulse is 75, and her BMI is 18 kg/m². Her abdomen is soft, but she does complain of some right-sided abdominal pain.

Investigations show

Hb 11.0 g/dl(11.5-16.5)

WCC $9.8 \times 10^9/L$ (4-11)

PLT $187 \times 10^9/L$ (150-400)

CRP 67 mg/l (<10)

Na 139 mmol/l (135-146)

K 4.8 mmol/l (3.5-5)

Cr 120 $\mu\text{mol/l}$ (79-118)

Colonoscopy reveals areas of discrete ulceration identified, punctuated by normal mucosa. The biopsy reveals transmural non-caseating granulomata.

Which of the following is the most likely diagnosis?

- 1- Amoebiasis
- 2- Behçet's syndrome
- 3- Crohn's disease
- 4- Ulcerative colitis
- 5- Yersinia infection

Answer & Comments

Answer: 3- Crohn's disease

The presence of skipping and full thickness inflammation with granuloma formation is typical of Crohn's disease. Whilst an infectious agent is a possibility, it is less likely than inflammatory bowel disease here.

We are not given a history of significant oral or genital ulceration, which makes Behçet's less likely.

Corticosteroids and 5-ASA compounds are the mainstay of therapy for Crohn's.



[Q: 2075] OnExamination 2012 - Gastroenterology

A 27-year-old woman presents to the Emergency department very agitated, complaining of abdominal pain. This has been her third attendance over the past six months, and each time there have been no significant findings. Her only medication of note is the oral contraceptive pill.

On this occasion her BP is elevated 155/90 mmHg, her pulse is 92, and her temperature is 37.8°C. Her abdomen is generally tender but soft, and she has active bowel sounds. She complains of lower limb weakness, and she appears to have 4/5 power weakness below the knee.

Investigations show:

Hb 13.4 g/dl(13.5-18)

WCC $10.2 \times 10^9/L$ (4-10)

PLT $194 \times 10^9/L$ (150-400)

Na 132 mmol/l (134-143)

K 4.4 mmol/l (3.5-5)

Cr 110 $\mu\text{mol/l}$ (60-120)

Which of the following is the most likely diagnosis?

- 1- Acute intermittent porphyria
- 2- Mesenteric adenitis
- 3- Münchausen's disease
- 4- Somatisation disorder
- 5- Variegate porphyria

Answer & Comments

Answer: 1- Acute intermittent porphyria

Acute intermittent porphyria (AIP) is associated with:

Hypertension

A mild increase in temperature

Non-specific abdominal pain

Hyponatraemia.

Patients feel normal between attacks, and the disease itself is due to accumulation of both porphobilinogen and amino-levulinic acid.

In general, drugs that lead to increased activity of the hepatic P450 system, such as phenobarbital, sulfonamides, oestrogens, and alcohol, are associated with increased risk of acute attacks.

The risk of other drugs is difficult to predict, and lists of agents thought to precipitate acute porphyria are available from the internet.



[Q: 2076] OnExamination 2012 -
Gastroenterology

A 21-year-old anorexic is admitted for parenteral nutrition and has a tunnelled line inserted.

A few days after parenteral feeding has begun you are asked to see her as she has begun complaining of diplopia, lethargy and muscle weakness. She also has paraesthesia affecting her hands and feet.

Examination confirms global muscle weakness and peripheral sensory loss.

Which of the following electrolyte abnormalities is the most likely to have occurred?

- 1- Hyperkalaemia
- 2- Hypermagnesaemia
- 3- Hyperphosphataemia
- 4- Hypocalcaemia
- 5- Hypophosphataemia

Answer & Comments

Answer: 5- Hypophosphataemia

This patient is suffering from re-feeding syndrome, where patients complain of a range of symptoms which can include

Muscle weakness

Peripheral neuropathy

Neurological impairment

Myocardial depression.

It is characterised by a fall in phosphate, magnesium, potassium and fluid accumulation, which in combination can lead to cardiac failure.

Patients at risk from re-feeding include those who are fed after a prolonged period of starvation, such as those with anorexia, and those with chronic alcoholism.

The key to avoiding re-feeding syndrome and hypophosphataemia is involvement of a specialist dietician who will be able to advise on adequate phosphate replacement during the initial stages of re-feeding.



[Q: 2077] OnExamination 2012 -
Gastroenterology

A 41-year-old woman comes to the gastroenterology clinic for review. She underwent extensive resection of her distal small bowel for Crohn's disease around three months earlier.

She is still suffering from diarrhoea and is worried that her Crohn's disease is still active. On examination her BP is 105/70 mmHg with a pulse of 80. Her abdomen is soft and non-tender.

Investigations show

Haemoglobin 10.4 g/dl(13.5-8)

White cell count $4.5 \times 10^9/L$ (4-10)

Platelets $195 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (134-143)

Potassium 3.4 mmol/l (3.5-5)

Creatinine 140 $\mu\text{mol/l}$ (60-120)

C reactive protein 9 mg/l (<10)

Which of the following is the most likely diagnosis?

- 1- Active Crohn's disease
- 2- Bacterial overgrowth syndrome
- 3- Bile acid diarrhoea
- 4- Ischaemic colitis
- 5- Short bowel syndrome

Answer & Comments

Answer: 3- Bile acid diarrhoea

We are told that this patient has undergone extensive distal small bowel resection, but she does not have an ileostomy. As such, it is most

likely that she has colonic bile acid irritation leading to diarrhoea.

Short bowel syndrome is usually associated with voluminous diarrhoea of up to 5 litres per day, normally through the ileostomy outlet.

There is no indication of active Crohn's disease, and bacterial overgrowth syndrome is usually associated with symptoms of abdominal bloating.

Cholestyramine may be effective for the treatment of bile acid diarrhoea.



[Q: 2078] OnExamination 2012 - Gastroenterology

A 58-year-old female with type 2 diabetes is admitted with diarrhoea and vomiting. She has noticed small amounts of blood in her stools. The vomiting had commenced one day after a meal of chicken and chips.

The patient's type 2 diabetes is treated with diet alone. Stool cultures taken by the GP reveal *Campylobacter jejuni*.

Which of the following is the most appropriate therapy?

- 1- Amoxicillin
- 2- Cefaclor
- 3- IV fluids
- 4- Metronidazole
- 5- Trimethoprim

Answer & Comments

Answer: 3- IV fluids

Campylobacter is a leading cause of diarrhoeal illness, often caused by ingestion of undercooked meat harbouring the pathogen. It is also a major cause of traveller's diarrhoea.

The use of antibiotic therapy for the management of *Campylobacter* infection in adults is controversial. Antibiotic of choice in this infection is erythromycin, though

ciprofloxacin and tetracycline may also be appropriate.

However, appropriate fluid replacement and anti-emetics are initially indicated - most units advocate no antibiotic treatment.



[Q: 2079] OnExamination 2012 - Gastroenterology

A patient presents with haematemesis.

An oesophagogastroduodenoscopy detects a bleed in the greater curvature of the stomach.

Which of the following arteries is most likely to be the source of the bleeding?

- 1- Cystic artery
- 2- Right gastric artery
- 3- Right hepatic artery
- 4- Splenic artery
- 5- Superior pancreaticoduodenal artery

Answer & Comments

Answer: 4- Splenic artery

The superior pancreaticoduodenal artery, a branch of the gastroduodenal artery, supplies the head of the pancreas and the upper duodenum and anastomoses with the inferior pancreaticoduodenal artery.

The right hepatic artery supplies the right lobe of the liver and part of the caudate lobe.

The right gastric artery is mainly found to supply the pylorus and the lesser curvature of the stomach.

The splenic artery sends branches to the greater curvature of the stomach, as well as supplying pancreas and spleen.



[Q: 2080] OnExamination 2012 - Gastroenterology

A patient presents with haematemesis. An oesophagogastroduodenoscopy detects a bleed in the lesser curvature of the stomach.

Which of the following arteries is most likely to be the cause of the bleeding?

- 1- Left gastro-omental artery
- 2- Pancreaticoduodenal artery
- 3- Right gastric artery
- 4- Right hepatic artery
- 5- Splenic artery

Answer & Comments

Answer: 3- Right gastric artery

The pancreaticoduodenal artery supplies mainly the upper and lower duodenum and the head of the pancreas.

The gastro-omental arteries supply the greater curvature of the stomach.

The right gastric artery arises from the hepatic artery or the left hepatic artery, supplies the pylorus and travels along the lesser curvature of the stomach, supplying it, and anastomosing with the left gastric artery.



[Q: 2081] OnExamination 2012 - Gastroenterology

A 51-year-old male labourer presents with a haematemesis.

Which of the following features confers the greatest risk of a poor outcome?

- 1- A blood pressure of 134/88 mmHg
- 2- A history of ischaemic heart disease (IHD)
- 3- A plasma glucose of 7.2 mmol/l
- 4- A pulse of 90 beats per minute
- 5- His age

Answer & Comments

Answer: 2- A history of ischaemic heart disease (IHD)

There are a number of available scoring systems which stratify subjects with GI bleed into high and low risk groups.

The Rockall scoring system is based on:

Age (the higher the age the worse the prognosis)

Comorbidities (IHD)

Presence of shock

Endoscopic abnormalities.

The Canadian Consensus Conference Statement utilises a similar system, incorporating endoscopic factors including:

Active bleeding

Major stigmata of recent haemorrhage

Ulcers greater than 2 cm in diameter

The location of ulcers in proximity to large arteries.

The Baylor Bleeding score attaches a score to pre- and post- endoscopic features.

The Blatchford score is based on clinical parameters alone:

Elevated blood urea nitrogen

Reduced haemoglobin

A drop in systolic blood pressure

Raised pulse rate

The presence of melaena or syncope

Evidence of hepatic or cardiac disease.



[Q: 2082] OnExamination 2012 - Gastroenterology

A study comparing contrast CT colonography with the reference technique of colonoscopy for large bowel carcinoma reveals the following data in 400 patients:

	CT Positive	CT Negative
Colonoscopy Positive	30	10
Colonoscopy negative	20	340

Which one of the following most accurately describes the performance of CT versus colonoscopy for the diagnosis of large bowel cancer?

- 1- There are 340 false negatives
- 2- There are 370 false negatives
- 3- There are 10 false positives
- 4- There are 20 false positives
- 5- There are 20 true negatives

Answer & Comments

Answer: 4- There are 20 false positives

In this question colonoscopy is the reference standard whilst CT colongraphy is the new test being evaluated.

There are 40 patients with bowel cancer as identified by colonoscopy. CT scanning correctly identifies 30 of these (true positives) but fails to identify 10 (false negatives). There are 360 patients without the disease with 20 identified as having cancer by CT (false positives), the remaining 340 are true negatives.



[Q: 2083] OnExamination 2012 - Gastroenterology

Which of the following gut hormones stimulates acid secretion in the stomach?

- 1- Cholecystokinin (CCK)
- 2- Gastrin
- 3- Polypeptide P
- 4- Secretin
- 5- Vasoactive intestinal peptide (VIP)

Answer & Comments

Answer: 2- Gastrin

Gastrin is secreted from the antrum of the stomach when stimulated by parasympathetic nerves and the presence of amino acids in the stomach.

It stimulates:

Gastric motility

Growth and acid secretion

Intestinal motility.

The secretion of gastrin is inhibited by acid in stomach and somatostatin.



[Q: 2084] OnExamination 2012 - Gastroenterology

A 64-year-old lady presents with symptoms suggestive of irritable bowel syndrome.

Which of the following would represent a 'red flag' indicator and prompt further investigation?

- 1- Abdominal pain
- 2- Bloating
- 3- Change in bowel habit for last two years
- 4- More frequent stools last two months
- 5- Weight gain

Answer & Comments

Answer: 4- More frequent stools last two months

The 'red flag' indicators are listed in the NICE guidelines as:

Unintentional and unintended weight loss

Rectal bleeding

A family history of bowel or ovarian cancer

A change in bowel habit to looser and / or more frequent stools persisting for more than six weeks in a person aged over 60 years.

Also on clinical examination the other 'red flag' indicators are:

Anaemia

Abdominal mass

Rectal mass

Inflammatory markers for inflammatory bowel disease.



[Q: 2085] OnExamination 2012 - Gastroenterology

A man is admitted with acute abdominal pain and vomiting. He is diagnosed and treated for acute pancreatitis.

Which of the following features is associated with a worse prognosis in acute pancreatitis?

- 1- Plasma glucose of 11.1 mmol/l (3.5-5.5)
- 2- Plasma sodium of 125 mmol/l (133-144)
- 3- Serum amylase of 1200 iu/l (24-100)
- 4- The patient is 50 years of age
- 5- White cell count of $13.9 \times 10^9/L$

Answer & Comments

Answer: 1- Plasma glucose of 11.1 mmol/l (3.5-5.5)

There are a number of criteria used in the Ranson's scoring system which reflect prognosis associated with acute pancreatitis.

Ranson's criteria on admission that signify a worse prognosis include:

Age more than 55 years

White cell count more than 16,000

Lactate dehydrogenase more than 600 U/l

Aspartate aminotransferase more than 120 U/l

Glucose more than 10 mmol/l.



[Q: 2086] OnExamination 2012 - Gastroenterology

A 70-year-old lady presented with dyspnoea and fever.

She has a history of weight loss which has been investigated with colonoscopy which found a tumour of the sigmoid colon and she is awaiting surgery.

On examination she has a systolic murmur and ECHO shows vegetations on the mitral valve. A diagnosis of infective endocarditis is made.

Which of the following organisms is associated with a high incidence of colorectal tumours?

- 1- Campylobacter jejuni
- 2- Enterococcus faecalis
- 3- Escherichia coli
- 4- Salmonella typhi
- 5- Streptococcus bovis

Answer & Comments

Answer: 5- Streptococcus bovis

Up to half of patients presenting with Streptococcus bovis endocarditis have colorectal tumours.



[Q: 2087] OnExamination 2012 - Gastroenterology

A 61-year-old man has a 2 cm adenoma removed from his sigmoid colon.

The biopsy results confirm an adenocarcinoma in situ with moderately differentiated dysplastic cells. The pathology report confirms total excision with clear resection margins.

What is the most appropriate follow up management for this patient?

- 1- Annual carcinoembryonic antigen (CEA)
- 2- Chemotherapy
- 3- No follow up
- 4- Regular follow up with colonoscopy
- 5- Regular follow up with no colonoscopy

Answer & Comments

Answer: 4- Regular follow up with colonoscopy

The first thing to note is the question is about planned management.

This patient has been picked up early and has had a tumour resected. His CEA would be normal and would not be expected to be elevated until the disease was quite established on the TNM scale.

However, this patient's prognosis would be excellent but he is by definition someone with increased risk.

Therefore, he should continue to be reviewed with colonoscopy annually for at least two years.



[Q: 2088] OnExamination 2012 - Gastroenterology

A 19-year-old student presents with a 15 week history of diarrhoea. He has lost 2 kg in weight, and has no recent travel abroad.

A smear of a duodenal biopsy reveals many trophozoites.

What is the best treatment option?

- 1- Ciprofloxacin
- 2- Gluten free diet
- 3- Metronidazole
- 4- Prednisolone
- 5- Quinine

Answer & Comments

Answer: 3- Metronidazole

The diagnosis here is giardiasis, caused by Giardia lamblia. Giardia has been reported as a cause of chronic diarrhoea.

Most patients respond to oral metronidazole 250-400 mg three times daily for five days.



[Q: 2089] OnExamination 2012 - Gastroenterology

A 69-year-old male is seen in the outpatients department. He reports weight loss of one stone over three months but his history is otherwise unremarkable.

On examination his abdomen is soft with no palpable masses. A PR examination is normal.

His blood tests show:

Haemoglobin 8.0 g/dL(12-16)

MCV 70 fL(80-96)

Which of the following is the most appropriate investigation for this patient?

- 1- Abdominal x ray and colonoscopy
- 2- CT scan of the abdomen and upper GI endoscopy
- 3- Sigmoidoscopy upper GI endoscopy
- 4- Ultrasound scan of abdomen and colonoscopy
- 5- Upper GI endoscopy and colonoscopy

Answer & Comments

Answer: 5- Upper GI endoscopy and colonoscopy

This man has weight loss and an unexplained microcytic anaemia.

The likely site of blood loss is from the gastrointestinal (GI) tract in absence of an alternative explanation.

This may be due to an occult GI malignancy and therefore the initial investigations of choice are upper and lower GI endoscopy.



[Q: 2090] OnExamination 2012 - Gastroenterology

A 40-year-old male presents with a six hour history of profuse vomiting and over the last two hours had developed left-sided chest pain and dyspnoea.

On examination he had a pulse of 110 beats per minute regular and a blood pressure of 168/90 mmHg.

On palpation, he had crepitus over the left supraclavicular region and neck, reduced heart sounds and left basal sided crackles, plus

some dullness to percussion over the right base of the chest.

What is the most likely diagnosis?

- 1- Aortic dissection
- 2- Aspiration pneumonia
- 3- Oesophageal rupture
- 4- Perforated peptic ulcer
- 5- Pneumothorax

Answer & Comments

Answer: 3- Oesophageal rupture

This man has a history of vomiting which then progressed to chest pain.

The most relevant finding on examination is the crepitus over the chest, indicating surgical emphysema. The most probable cause is therefore spontaneous rupture of the oesophagus.

Mackler's triad (vomiting, chest pain and surgical emphysema) is classical but absent in almost half the cases. The chest x ray (CXR) may reveal the surgical emphysema and a gastrografen swallow is diagnostic.

A CT scan should be performed if a gastrografen swallow is not possible or negative.

Lateral neck x rays may be useful in the early stages where the diagnosis is uncertain and surgical emphysema is not seen on a plain CXR.

Oesophagoscopy has a role in trauma but not in small mucosal tears as here.



[Q: 2091] OnExamination 2012 - Gastroenterology

Which of the following is most commonly associated with the development of pseudomembranous colitis?

- 1- Cefuroxime
- 2- Ciprofloxacin

- 3- Co-trimoxazole
- 4- Erythromycin
- 5- Flucloxacillin

Answer & Comments

Answer: 1- Cefuroxime

Clostridium difficile a Gram positive anaerobic bacterium is the cause of pseudomembranous colitis.

Studies show that when *C. difficile* colonise the gut they release two potent toxins, toxin A and toxin B, which bind to certain receptors in the lining of the colon and ultimately cause diarrhoea and inflammation of the large intestine or colon (colitis).

Commonly the disease is caused by broad spectrum antibiotics most commonly cephalosporins, broad spectrum penicillins and clindamycin. Less commonly, macrolides and quinolones have been reported to cause the disorder.

Appropriate treatment includes metronidazole and oral vancomycin.



[Q: 2092] OnExamination 2012 - Gastroenterology

A 45-year-old male with a long history of alcohol abuse presents with a two day history of deteriorating confusion.

On examination he is drowsy, has a temperature of 39°C, a pulse of 110 beats per minute, a small amount of ascites and has features of a left side hemiparesis.

What is the most likely diagnosis?

- 1- Cerebral abscess
- 2- Cerebro-vascular accident (CVA)
- 3- Hepatic encephalopathy
- 4- Subdural haematoma
- 5- Wernicke's encephalopathy

Answer & Comments

Answer: 1- Cerebral abscess

This man with chronic alcohol abuse now presents with a fever and left hemiparesis.

The most likely diagnosis would therefore be cerebral abscess.

The fever would not itself be explained by a subdural haematoma nor would a simple CVA explain this.

Similarly, delirium tremens or encephalopathy would not be associated with the hemiparesis.



[Q: 2093] OnExamination 2012 - Gastroenterology

Which of the following statements is correct concerning the relationship between type 2 diabetes and colonic cancer?

- 1- Increased concentrations of C peptide are a marker of increased colorectal cancer risk
- 2- Insulin treatment increases recurrence free survival after treatment of colonic cancer
- 3- The increased risk of colorectal cancer in diabetes is related to BMI
- 4- The increased risk of colorectal cancer in diabetes is related to total cholesterol
- 5- Type 1 diabetes has similar risks of colonic cancer as does type 2 diabetes

Answer & Comments

Answer: 1- Increased concentrations of C peptide are a marker of increased colorectal cancer risk

Type 2 diabetes is associated with a 40-60% increase in the risk of cancer of the large bowel. This increase is linked to changes in HbA1c.

Type 2 diabetes is associated with significantly higher rates of overall mortality and reduced disease free and recurrence free survivals after chemotherapy/radiotherapy, and insulin

has not been shown to have any effects on mortality.

No association has been found between colonic malignancy and type 1 diabetes, nor gestational diabetes.

A number of studies have independently linked high circulating concentrations of C-peptide, as a marker of insulin production, with increased colorectal cancer risk. The molecular basis has not been proven, but it may be reasonable to extrapolate it is linked to the growth stimulation effects of insulin. For a discussion see BMJ 2005;330:551-2.



[Q: 2094] OnExamination 2012 - Gastroenterology

A 43-year-old woman presents with abdominal pain and watery diarrhoea.

She is taking ibuprofen for joint pains and has been previously investigated for infertility. She was given a proton pump inhibitor (PPI) by her GP for six weeks with no relief of her symptoms.

Investigations show:

Haemoglobin 12.2 g/dL (11.5-16.5)

Calcium 2.86 mmol/L (2.2-2.6)

Albumin 42 g/L (37-49)

Phosphate 0.8 mmol/L (0.8-1.4)

CRP 10 mg/L (<10)

Endoscopy Multiple small duodenal ulcers

H. pylori Negative

What is the likely diagnosis?

- 1- Crohn's disease
- 2- Cushing's syndrome
- 3- NSAID induced PUD
- 4- Multiple endocrine neoplasia (MEN)
- 5- Small bowel lymphoma

Answer & Comments

Answer: 4- Multiple endocrine neoplasia (MEN)

The C reactive protein (CRP) is not raised making a diagnosis of Crohn's unlikely.

The duodenal ulcers (DUs) have persisted despite a lengthy treatment with PPIs.

Small bowel lymphoma is suggested by narrowing of the intestine lumen resulting in paraumbilical pain made worse by eating, with weight loss, vomiting and occasional intestinal obstruction. Small bowel lymphoma is diagnosed by contrast radiographs and intestinal biopsy.

The most likely diagnosis here is MEN, likely to be MEN1a (Wermer's syndrome).

Multiple DUs make a diagnosis of Zollinger-Ellison's syndrome likely, due to gastrinomas.

Hypergastrinaemia may be the cause of the diarrhoea.

There is also hypercalcaemia as a result of the parathyroid hyperplasia indicative of this condition.

There may not necessarily be a family history, sporadic cases make up 10% of new cases.

The infertility would fit with a prolactinoma.



[Q: 2095] OnExamination 2012 - Gastroenterology

A 50-year-old woman with a long history of alcohol abuse is prescribed phenytoin for epilepsy.

Examination was normal except for a liver edge.

Her full blood count reveals:

Haemoglobin 10.0 g/dL (11.5-16.5)

MCV 122 fL (80-96)

White cell count $2.2 \times 10^9/L$ ($4-11 \times 10^9$)

Platelet count $85 \times 10^9/L$ ($150-400 \times 10^9$)

What is the most likely explanation for these results?

1- Alcoholic liver disease

2- Aplastic anaemia

3- Folic acid deficiency

4- Hypothyroidism

5- Vitamin C deficiency

Answer & Comments

Answer: 3- Folic acid deficiency

Folic acid deficiency would give all these results. In addition she has good reason to be folate deficient - drinks a considerable amount and is on anticonvulsants.

Alcoholic liver disease on its own would not usually cause leucopenia. Where cirrhosis develops leading to portal hypertension and splenomegaly it may result in functional hypersplenism. This may result in pancytopenia. Alcohol itself is also a myelosuppressant. In this case the clinical examination does not support a diagnosis of cirrhosis and a toxic alcohol effect on the marrow is not an option in the answers.

Hypothyroidism would cause a raised mean corpuscular volume (MCV) but not the other parameters.

Scurvy does not cause this picture.

Aplastic anaemia could cause this haematological picture but the clinical scenario leads towards folic acid deficiency.



[Q: 2096] OnExamination 2012 - Gastroenterology

A 78-year-old woman with hip osteoarthritis presents with altered bowel habit.

She undergoes a sigmoidoscopy and rectal biopsy shows normal epithelium and pigment-laden macrophages in the lamina propria.

What is the most likely cause of these findings?

- 1- Diverticular disease
- 2- Laxative abuse
- 3- Mesenteric ischaemia
- 4- Non-steroidal anti-inflammatory drugs
- 5- Ulcerative colitis

Answer & Comments

Answer: 2- Laxative abuse

She has 'melanosis coli' as a result of prolonged laxative use.

Often the bowel mucosa looks dark and 'stained' during colonoscopy.

She may be predisposed to constipation due to immobility from her arthritis and/or use of constipating pain killers.



[Q: 2097] OnExamination 2012 - Gastroenterology

A 30-year-old man presents with acute, profuse, watery diarrhoea with some blood after returning from a holiday in Tanzania. He had been taking oral rehydration salts.

Which one of the following is the most appropriate treatment?

- 1- Ciprofloxacin
- 2- Loperamide
- 3- Metronidazole
- 4- Prednisolone
- 5- Vancomycin

Answer & Comments

Answer: 1- Ciprofloxacin

The most likely cause of such traveller's diarrhoea is *Escherichia coli* and hence ciprofloxacin is recommended for first line antibiotic therapy (when needed) before stool culture results are available.

Metronidazole would be suitable for *Giardia* infection but its course is usually more insidious.



[Q: 2098] OnExamination 2012 - Gastroenterology

A 33-year-old man with chronic hepatitis C is admitted with general deterioration, he has no specific symptoms.

He has missed many of his previous outpatient appointments and currently is not receiving any treatment.

On examination he is generally unwell with a temperature of 37.4°C, blood pressure of 130/72 mmHg and appears jaundiced with the presence of ascites.

His investigations reveal:

Serum Sodium 133 mmol/L (137-144)

Serum Potassium 4.3 mmol/L (3.5-4.9)

Serum Urea 21 mmol/L (2.5-7.5)

Serum Creatinine 336 µmol/L (60-110)

Bilirubin 78 µmol/L (1-22)

AST 92 U/L (5-35)

Alk Phosphatase 267 U/L (45-105)

Albumin 30 g/L (37-49)

Urine sodium 60 mmol/L

Urine dipstick - + blood, +++ protein, leukocytes trace, nitrites negative

Ascitic fluid analysis - RBCs 1,231/mm³, WBCs 190/mm³ (60% lymphocytes), albumin 12 g/L

What is the likely diagnosis?

- 1- Abdominal tuberculosis
- 2- Urinary tract infection
- 3- Hepatorenal syndrome
- 4- Mixed essential cryoglobulinaemia
- 5- Spontaneous bacterial peritonitis

Answer & Comments

Answer: 4- Mixed essential cryoglobulinaemia

This gentleman has renal failure with evidence of a primary renal pathology - significant proteinuria, relative hypertension. Hepatitis C infection is strongly associated with mixed essential cryoglobulinaemia which may produce mesangioproliferative glomerulonephritis. This condition is associated with renal impairment, systemic vasculitic manifestations (including neuropathy, skin manifestations) and arterial thrombosis.

Hepatorenal syndrome is a diagnosis of exclusion and requires correction of hypovolaemia, withdrawal of any diuretics, treatment of sepsis and exclusion of a primary renal pathology prior to diagnosis. In hepatorenal syndrome the kidneys are functionally normal and biopsy is normal, where patients in this situation receive liver transplantation the kidneys will almost always resume normal function. The urinary sodium and urine dipstick results given here indicate a primary renal pathology.

The ascitic tap results indicate that ascites is due to portal hypertension (serum albumin ascites gradient >11 g/L) and do not support the presence of infection within the ascitic fluid, counting against both abdominal tuberculosis and spontaneous bacterial peritonitis.

In the absence of symptoms a urine dipstick indicating a trace of leukocytes and negative nitrites is poorly predictive of the presence of a urinary tract infection, additionally this diagnosis does not adequately explain the degree of proteinuria or renal impairment.



[Q: 2099] OnExamination 2012 - Gastroenterology

With respect to gastric carcinoma, which of the following statements is true?

- 1- Aspirin use is a risk factor for gastric carcinoma

- 2- Early diagnosis of gastric carcinoma results in a five year survival rate of 20%
- 3- Endoscopic ultrasonography is superior to conventional CT scanning for local tumour staging
- 4- Helicobacter pylori infection is not associated with gastric carcinoma
- 5- Incidence of distal stomach tumours is increasing

Answer & Comments

Answer: 3- Endoscopic ultrasonography is superior to conventional CT scanning for local tumour staging

Incidence of distal stomach tumours is actually decreasing while the incidence of tumours in the proximal stomach is increasing.

Nonsteroidal anti-inflammatory drug (NSAID) use is associated with decreased risk of certain gastric tumours.

H. pylori infection has been associated in a number of studies with increased risk of gastric carcinoma.

Screening for gastric carcinoma in Japan detects up to 40% of gastric carcinomas at an early stage and in skilled hands five year survival can be upwards of 90%.

Computed tomography (CT) with gastric dilatation is a useful complementary investigation in the staging of gastric carcinoma, but endoscopic ultrasonography is superior to conventional CT scanning as it is able to assess depth of infiltration and lymphatic dissemination of tumour.

For a comprehensive review see Lancet 2003;362:305-15.



[Q: 2100] OnExamination 2012 - Gastroenterology

A 56-year-old female is noted to have hepatomegaly.

Six years ago she was diagnosed with diabetes mellitus and takes metformin 500 mg tds and gliclazide 80 mg bd. She drinks approximately 15 units of alcohol weekly and stopped smoking 10 years ago.

On examination she has a BMI of 36.2 kg/m², no stigmata of liver disease are evident but she has 6 cm hepatomegaly.

Investigations reveal:

Total Bilirubin 11 µmol/L(1-22)

Alkaline phosphatase 145 U/L(45-105)

AST 100 U/L(1-31)

ALT 150 U/L(5-35)

Albumin 40 g/L(37-49)

Ferritin 434 µg/L(15-300)

Ultrasound of the abdomen reveals an echobright appearance of the liver and gallstones in the gallbladder.

What is the most likely cause of her liver disease?

- 1- Alcoholic liver disease
- 2- Drug induced hepatitis
- 3- Gallstone disease
- 4- Haemochromatosis
- 5- Non-alcoholic steatohepatitis (NASH)

Answer & Comments

Answer: 5- Non-alcoholic steatohepatitis (NASH)

The patient has a hepatic picture in contrast to cholestasis.

Ferritin level is not too high to be considered for haemochromatosis and is an acute phase reactant being typically increased in any inflammatory process.

NASH is very common and is typically encountered in obese patients presenting with a hepatic picture with or without jaundice. Echobright liver suggests fatty change in the liver seen in NASH. It was

previously termed idiopathic decompensated hepatitis and if not treated in terms of lowering BMI and reducing fat intake can lead on to irreversible cirrhosis.

Gallstones are a distraction in this history.



[Q: 2101] OnExamination 2012 - Gastroenterology

A 52-year-old man presents with general deterioration.

He drinks approximately 25 units of alcohol each week and is a smoker of five cigarettes daily.

Examination reveals that he is jaundiced, has numerous spider naevi on his chest and he has a temperature of 37.2°C. Abdominal examination reveals hepato-splenomegaly.

Investigations reveal:

Bilirubin 100 micromol/L (1-22)

Alkaline phosphatase 310 iu/l (45 - 105)

ALT 198 iu/l (5 - 35)

AST 158 iu/l (1 - 31)

Albumin 25 g/L (37 - 49)

Hepatitis B virus surface antigen positive

Hepatitis B virus e antigen negative

Hepatitis B virus DNA awaited

What is the most likely diagnosis?

- 1- Alcoholic liver disease
- 2- Autoimmune chronic active hepatitis
- 3- Carcinoma of the pancreas
- 4- Chronic hepatitis B infection
- 5- Chronic hepatitis D (delta) infection

Answer & Comments

Answer: 4- Chronic hepatitis B infection

The most likely diagnosis is chronic hepatitis B infection given the positive HBV sAg test, multiple stigmata of chronic liver disease and the modest, ALT-predominant transaminitis.

A positive HBVsAg test indicates active hepatitis B infection. Two positive tests six months apart indicate chronic infection however a single positive test without any history of high-risk exposure in the last six months is suggestive.

Alcohol may be contributing to the degree of liver inflammation seen here however the overall amount of alcohol consumed is relatively low and alcohol-related liver disease is typically associated with an AST-predominant elevation in the liver function tests.

Autoimmune chronic active hepatitis would provide an explanation for abnormal liver function tests such as these however it would be unusual in a patient such as this and the positive HBVsAg points to an alternative cause.

Although the alkaline phosphatase level is raised when considered relative to the normal range the degree of elevation is not as significant as for the transaminases indicating that the jaundice is most likely hepatocellular rather than cholestatic (as would be seen in carcinoma of the pancreas obstructing the biliary system).

Additionally this diagnosis would not explain the florid stigmata of chronic liver disease. Infiltrative disease of the liver (for example, widespread metastases) tends to cause an isolated, sometimes profound, elevation of the alkaline phosphatase without any other abnormality on the liver function tests.

Hepatitis D (also known as the delta agent) may cause acute or chronic infection in the setting of hepatitis B infection. It may be a cause of acute hepatitis or decompensation of chronic liver disease. Those patients with super-added HDV infection and chronic hepatitis B tend to progress to cirrhosis and develop hepatocellular carcinoma more rapidly.

Overall HDV infection is rare, less prevalent than HBV infection and is uncommon in Europe with it being reported only in patients who have a history of high-risk behaviours such as injection drug abuse. High prevalence areas include South Italy, North Africa and the Middle East.

It would be unlikely in this individual given the information available.



[Q: 2102] OnExamination 2012 - Gastroenterology

A 40-year-old man is referred with gastro-oesophageal reflux disease (GORD).

Which of the following concerning GORD is correct?

- 1- Acid suppressant therapy should not be given continuously
- 2- Endoscopy is mandatory
- 3- In the presence of Barrett's oesophagus, the risk of future malignancy can be assessed endoscopically without biopsy
- 4- Oesophageal pH monitoring is a good guide to therapy
- 5- Symptoms do not correlate with mucosal status at endoscopy

Answer & Comments

Answer: 5- Symptoms do not correlate with mucosal status at endoscopy

Symptoms of GORD do not correlate with the mucosal appearances at endoscopy.

Although endoscopy should be performed in cases that are not clear cut or do not respond to proton pump inhibitors (PPIs), it is not mandatory.

The risk with Barrett's and hence the diagnosis of Barrett's can only be clarified with biopsy.

Monitoring of pH is not a good guide to therapy but symptomatic improvement is a good guide to the efficacy of therapy.

PPIs can be given continuously where the diagnosis has been satisfactorily proven and relapse of symptoms persist after withdrawal.



[Q: 2103] OnExamination 2012 - Gastroenterology

A 65-year-old man was investigated for weight loss and dyspepsia.

Endoscopic examination revealed an ulcerated lesion in the stomach and biopsy revealed the presence of a low grade mucosa-associated lymphoma with *Helicobacter pylori*.

Further investigation with CT of chest and abdomen were normal as were bone marrow aspirate and trephine.

What is the best treatment option for this patient?

- 1- Eradication therapy for *Helicobacter pylori*
- 2- IV chemotherapy
- 3- Oral chlorambucil
- 4- Partial gastric resection
- 5- Radiotherapy

Answer & Comments

Answer: 1- Eradication therapy for *Helicobacter pylori*

This is a gastric mucosal-associated lymphoid tissue (MALT) tumour.

These are usually marginal zone B cell lymphomas and associated with an excellent prognosis.

Low grade gastric MALT tumours associated with *Helicobacter pylori* infection respond in over 80% to *Helicobacter* eradication as the primary mode of treatment.

Radiotherapy is considered but is generally unnecessary.



[Q: 2104] OnExamination 2012 - Gastroenterology

A new diagnostic test for malabsorption has been analysed and the results have yielded the following 2x2 contingency table:

	Disease present	
	Yes	No
+ve test result	90	10
-ve test result	20	80

Applying this test to a case of chronic diarrhoea from a patient group where the prevalence of malabsorption is known to be 20% (probability = 0.2).

What is the probability of a patient having malabsorption if they have a positive test?

- 1- 0.16
- 2- 0.24
- 3- 0.48
- 4- 0.64
- 5- 0.8

Answer & Comments

Answer: 4- 0.64

This is tough but the College are putting more and more evidence based medicine questions into the examination. This question tests understanding of pre-test and post-test odds, likelihood ratios, sensitivity and specificity. Getting it right requires you to recognise that the prevalence of the condition is different in population from which the contingency table was produced (55%) as compared to the population from which the patient in question comes (20%).

You are being asked to calculate the positive posttest probability - ie the likelihood that a patient has the condition in question given a positive test. Where there is nothing to suggest that an individual's likelihood of having a particular condition is any different from the reference population then the

positive predictive value may be used as an estimate of the positive posttest probability however this is not the case here. As a result you are required to calculate likelihood ratios and take account of the prevalence of the condition within the new test population.

The calculation is as follows.

$$\text{Sensitivity} = A/(A+C) = 90/(90 + 20) = 0.818$$

$$\text{Specificity} = D/(B+D) = 80/(10 + 80) = 0.889$$

$$\text{Likelihood ratio for a positive test (LR+)} = \text{sensitivity}/(1 - \text{specificity}) = 0.818 / (1 - 0.889) = 7.2$$

$$\text{Pre-test odds} = \text{prevalence}/(1 - \text{prevalence}) = 0.2 / (1 - 0.2) = 0.25$$

$$\text{Post-test odds} = \text{pre-test odds} \times \text{LR+} = 0.25 \times 7.2 = 1.8$$

$$\text{Post-test probability} = \text{posttest odds}/(\text{posttest odds} + 1) = 1.8 / (1.8 + 1) = 0.64$$

Disease present

test result yes no

+ve true positive (A) false positive (B)

-ve false negative (C) true negative (D)

The following are formulas for calculating various common statistical values used in understanding the value of diagnostic tests:

$$\text{Sensitivity (how much a test is positive in disease)} = A / (A + C)$$

$$\text{Specificity (how much a test is negative in health)} = D / (B + D)$$

$$\text{Positive predictive value} = A / (A + B)$$

$$\text{Negative predictive value} = D / (C + D)$$

Pre-test odds = the odds of having the disease before you do the test (for example, your rule-of-thumb estimate or the prevalence of the disease in the population or based on clinical findings, etc.)

Post-test odds = the odds of having the disease after you did the test

$$\text{Systematic error} = (A + B) / (A + C)$$

Likelihood ratio (LR) = (the ratio of the chance of having a positive test if the disease is present to the chance of having a positive test if the disease is absent) = sensitivity / (1 - specificity)

$$\text{LR-} = (1 - \text{sensitivity}) / \text{specificity}$$

Likelihood ratios are good for

Directly calculating post-test odds

Tests with multiple levels (that is, not just +ve or -ve). Calculate the LR at each level by taking the ratio of true +ves to false +ves both expressed as percentages of the total number tested.

Diseases requiring multiple tests. The post-test odds after one test is the pre-test odds for the next.



[Q: 2105] OnExamination 2012 - Gastroenterology

A 56-year-old man from Thailand presented with abdominal pain and a mass in the right upper quadrant. He reported that he had been diagnosed with viral hepatitis several years previously.

Investigations showed:

Serum alpha-fetoprotein 13,500 IU/L (< 10)

What is the most likely underlying viral infection?

- 1- Hepatitis A virus
- 2- Hepatitis B virus
- 3- Hepatitis C virus
- 4- Hepatitis D virus
- 5- Hepatitis E virus

Answer & Comments

Answer: 2- Hepatitis B virus

The patient has chronic viral hepatitis and presents with a hepatoma.

The underlying cause must be either hepatitis B virus (HBV) or hepatitis C virus (HCV).

There is a higher prevalence of HBV in the Far East and since his country of origin is the only other detail that gives a clue to the cause of his hepatitis, the most likely viral agent is HBV.



[Q: 2106] OnExamination 2012 - Gastroenterology

Which one of the following statements is true of autoimmune hepatitis?

- 1- It is associated with hypogammaglobulinaemia
- 2- It may be associated with keratoconjunctivitis sicca
- 3- It rarely interferes with menstruation except in later stages
- 4- It rarely presents before 20 years of age
- 5- It usually presents as an acute hepatitis

Answer & Comments

Answer: 2- It may be associated with keratoconjunctivitis sicca

It occurs frequently in young (10-20 years) and middle-aged women.

Twenty five per cent present as acute hepatitis, but usually the onset is insidious.

Some may be asymptomatic for years and then are found to have signs of chronic liver disease.

Amenorrhoea is common.

It is associated with hyperglobulinaemia and other autoimmune disease.

Sixty per cent are associated with HLA-B8, DR3 and Dw3.

The sicca syndrome (xerostomia/dry eyes, keratoconjunctivitis sicca) may occur.



[Q: 2107] OnExamination 2012 - Gastroenterology

Which of the following is correct regarding infection with Salmonella typhi?

- 1- Children are particularly likely to become carriers
- 2- Most carriers are female
- 3- Faecal culture is almost always positive during the first week of illness
- 4- Relapse does not occur if antibiotics are taken for two weeks
- 5- Vaccinated individuals who develop the disease will have a mild illness

Answer & Comments

Answer: 2- Most carriers are female

Children are rarely chronic carriers of the organism although for some unknown reason females are more commonly long term carriers than males (remember Typhoid Mary).

C. Only 50% of cases.

E. Higher threshold but same disease.



[Q: 2108] OnExamination 2012 - Gastroenterology

A 28-year-old male presents with a four day history of profuse bloody diarrhoea after returning from a holiday in the Far East.

Which of the following regarding his illness is true?

- 1- A negative amoebic fluorescent antibody test excludes a diagnosis of acute amoebic dysentery
- 2- Cysts to *E. histolytica* in the stools confirms a diagnosis of acute amoebic dysentery
- 3- Cholera is a likely diagnosis
- 4- Giardiasis is a likely diagnosis
- 5- Shigellosis is a likely diagnosis

Answer & Comments

Answer: 5- Shigellosis is a likely diagnosis

Shigellosis is a possible cause of profuse bloody diarrhoea as cholera and giardiasis are associated with watery diarrhoea.

Trophozoites are seen in acute amoebic dysentery, and the test is not 100% sensitive.



[Q: 2109] OnExamination 2012 - Gastroenterology

A 44-year-old male with Child's grade C cirrhosis presented with haematemesis.

Which one of the following drugs, administered intravenously, would be the most appropriate immediate treatment?

- 1- Isosorbide dinitrate
- 2- Omeprazole
- 3- Propranolol
- 4- Somatostatin
- 5- Tranexamic acid

Answer & Comments

Answer: 4- Somatostatin

The suggestion is that this patient is at particularly high risk of oesophageal varices.

Child's classification of cirrhosis is a points scale, based upon ascites/bilirubin, etc, reflecting prognosis. The grades depend on the points scored from A-C, with C reflecting greatest risk.

Somatostatin acts to reduce portal pressures and has been demonstrated to be as effective as endoscopy at controlling variceal bleeding in the acute setting.

B-blockers can be used as oral prophylaxis for oesophageal varices.

Intravenous omeprazole has also been shown to be effective in reducing mortality in gastrointestinal haemorrhage of any cause

(NEJM 2002) but somatostatin may be expected to be superior for the above patient.



[Q: 2110] OnExamination 2012 - Gastroenterology

A 32-year-old woman with Crohn's disease has a history of a right hemicolectomy for ileo-colonic disease.

Since the operation she has had frequent diarrhoea but no blood in the stools.

Investigations show:

ESR 10mm (0-20mm/1st hour)

Platelets $240 \times 10^9/L$ (150-400 $\times 10^9$)

Serum CRP 7 mg/L (<10)

Which is the best treatment?

- 1- Cholestyramine
- 2- Mesalazine
- 3- Metronidazole
- 4- Omeprazole
- 5- Prednisolone

Answer & Comments

Answer: 1- Cholestyramine

The erythrocyte sedimentation rate (ESR), C reactive protein (CRP) and platelet counts are not raised indicating that this patient's symptoms are not due to active Crohn's. Also the diarrhoea is not bloody which goes against active Crohn's colitis.

Hence mesalazine or prednisolone would not be effective here.

Metronidazole is typically given for peri-anal disease.

The history includes a previous right hemicolectomy for ileo-colonic disease.

Loss of the terminal ileum frequently leads to bile salt malabsorption and treatment with the bile salt chelator cholestyramine quickly relieves the problem.



[Q: 2111] OnExamination 2012 -
Gastroenterology

A 52-year-old woman presented with history of worsening dysphagia over many years. Recently there had been episodes of ill-defined central chest discomfort and nocturnal cough.

What is the most likely diagnosis?

- 1- Achalasia
- 2- Barrett's oesophagus
- 3- Motor neurone disease (MND)
- 4- Oesophageal carcinoma
- 5- Pharyngeal pouch

Answer & Comments

Answer: 1- Achalasia

Achalasia presents most often in the third to fifth decade. Symptoms usually develop years before the patient presents. Vague chest discomfort is common. Thirty per cent have a nocturnal cough due to aspiration of oesophageal contents.

Barrett's oesophagus does not cause dysphagia.

MND causes dysphagia due to problems with chewing and initiating a swallow and would not cause chest discomfort.

Oesophageal carcinoma is very unlikely due to the duration of symptoms (years).

A pharyngeal pouch usually presents in the sixth to seventh decade with regurgitation and would not cause chest discomfort.



[Q: 2112] OnExamination 2012 -
Gastroenterology

Which of the following is the commonest cause of traveller's diarrhoea?

- 1- Entamoeba histolytica
- 2- Escherichia coli

- 3- Giardia lamblia
- 4- Shigella flexneri
- 5- Yersinia enterocolitica

Answer & Comments

Answer: 2- Escherichia coli

Enterotoxigenic E coli is the commonest cause of traveller's diarrhoea and is usually a self limiting condition.

Usually no treatment or investigation is required for this brief diarrhoeal illness.

Other causes that may be associated with prolonged diarrhoea include Giardia and amoebiasis.

Chronic diarrhoea merits investigation.



[Q: 2113] OnExamination 2012 -
Gastroenterology

Which of the following factors decrease large intestinal motility?

- 1- Anticholinergic agents
- 2- CCK-PZ
- 3- Gastric distension
- 4- Laxatives
- 5- Parasympathetic activity

Answer & Comments

Answer: 1- Anticholinergic agents

The other options and cholinergic agents increase large intestinal motility.



[Q: 2114] OnExamination 2012 -
Gastroenterology

A 30-year-old Caucasian male presents with a six month history of weight loss, abdominal pain, and diarrhoea. On examination you note finger clubbing.

Which of the following diagnoses is least likely.?

- 1- Coeliac disease
- 2- Crohn's disease
- 3- Ileo-caecal TB
- 4- Ulcerative colitis
- 5- Whipple's disease

Answer & Comments

Answer: 3- Ileo-caecal TB

Ileo-caecal TB is the only condition mentioned not associated with clubbing and would be very rare in a young Caucasian in the United Kingdom.



[Q: 2115] OnExamination 2012 -
Endocrinology

A 56-year-old man presented to the Emergency Department with an episode of collapse at home.

He had been feeling increasingly tired for the last two months and also reported a loss of libido. He had undergone a transsphenoidal surgery two years ago, followed by external beam radiation for a non-functional pituitary adenoma. He took ramipril 10 mg OD for hypertension.

On examination, pulse was 102 beats per minute and regular, BP measured 104/66 mmHg in the lying position, dropping to 80/40 mmHg on standing. Heart sounds were normal. There was no galactorrhoea to expression and testicular volume was normal.

Investigations showed:

Serum Sodium 129 mmol/L(137-144)

Serum Potassium 4.8 mmol/L(3.5-4.9)

Serum Urea 7.2 mmol/L(2.5-7.5)

Serum creatinine 88 µmol/L(60-110)

Serum testosterone 4.5 nmol/L(9-35)

Plasma LH 0.3 U/L(1-10)

Plasma thyroid-stimulating hormone 0.1 mU/L(0.4-5)

Plasma Free T₄ 7 pmol/L(10-22)

Insulin-like growth factor 15.2 nmol/L(5.6-23.3)

ECG Normal

Which is the next most appropriate investigation?

- 1- GHRH-arginine test
- 2- Insulin stress test
- 3- MRI scan of pituitary
- 4- Short Synacthen test
- 5- TRH test

Answer & Comments

Answer: 4- Short Synacthen test

The most appropriate investigation in this patient who has biochemistry suggestive of hypopituitarism and has hyponatraemia is to establish whether he has hypoadrenalism.

Thus the short Synacthen test is most appropriate and in view of the seriousness of undetected hypoadrenalism should be the first test.



[Q: 2116] OnExamination 2012 -
Endocrinology

A 48-year-old lady with Addison's disease presented in a small peripheral clinic. She says that she has run out of her hydrocortisone and she usually takes 20 mg in the morning and 10 mg in the evening.

No hydrocortisone is available at the clinic but you do have prednisolone which you would like to prescribe instead until a prescription of hydrocortisone can be dispensed.

What is the equivalent daily dose of prednisolone?

- 1- 2.5 mg
- 2- 5 mg
- 3- 7.5 mg
- 4- 10 mg
- 5- 20 mg

Answer & Comments

Answer: 3- 7.5 mg

1 mg is equivalent to 4 mg hydrocortisone so this lady should be given 7.5 mg.

If 2.5 mg tablets were not available (to go with a 5 mg tablet to make 7.5 mg tablet) then 10 mg would be fine.

It is better to overdose rather than underdose especially where there is stress or illness.



[Q: 2117] OnExamination 2012 - Endocrinology

A 39-year-old female presents with lethargy, nausea, and muscle cramps; and she has passed 450 ml of urine in the last 24 hours.

She was recently started on a new medication.

Investigations show:

Serum sodium 128 mmol/l (137-144)

Plasma osmolality 272 mosmol/l (275-290)

Urine osmolality 380 mosmol/l (350-1000)

Which of the following recently prescribed drugs accounts for the findings?

- 1- Aspirin
- 2- Fluoxetine
- 3- Furosemide
- 4- Lithium
- 5- Metoprolol

Answer & Comments

Answer: 2- Fluoxetine

This lady has:

Hyponatraemia

Hypotonicity (low serum osmolality) and

Inappropriately concentrated urine

which are consistent with syndrome of inappropriate antidiuretic hormone (ADH).

Of the drugs listed, fluoxetine is the most likely cause of syndrome of inappropriate secretion of antidiuretic hormone (SIADH).



[Q: 2118] OnExamination 2012 - Endocrinology

A 57-year-old man attends the outpatient clinic. He has had type 2 diabetes for seven years having been diagnosed following an acute myocardial infarction at 50 years of age.

His diabetes was deteriorating with blood glucose readings of 9-12 at home despite following a diet and taking regular exercise.

Another practitioner commenced him on pioglitazone. His current treatment is metformin 850 tds, pioglitazone 30 mg, aspirin 75 mg/day, carvedilol 12.5 mg bd, ramipril 10 mg od, furosemide 80 mg daily, simvastatin 40 mg/day.

On examination he is overweight with a BMI of 29, his BP is 128/74 mmHg with pulse rate of 63 min⁻¹. He has no heart murmurs and there is some pitting oedema in the lower limbs. Auscultation reveals a clear chest with no evidence of pulmonary oedema. He is obese with no organomegaly.

His ECG shows sinus rhythm with poor r wave progression.

His HbA1c checked in the clinic is 8.5% (3.8-6.4).

What is the most appropriate way to treat his glycaemic control?

- 1- Add gliclazide 80 mg bd
- 2- Increase pioglitazone to 45 mg daily
- 3- Stop metformin and use Competact (combination of metformin and pioglitazone)
- 4- Substitute pioglitazone with gliclazide 80 mg bd
- 5- Add insulin to his regime

Answer & Comments

Answer: 4- Substitute pioglitazone with gliclazide 80 mg bd

This patient is likely to be insulin resistant; however there is evidence of heart failure and fluid overload, so use of pioglitazone is absolutely contraindicated. These drugs promote fluid retention by means of an action on the collecting ducts of the kidney so promoting sodium and water retention.

The only appropriate action therefore is to stop pioglitazone, substitute this with the insulin secretagogue gliclazide which will hopefully improve his glycaemic control, although progression to insulin may not be too far around the corner.



[Q: 2119] OnExamination 2012 - Endocrinology

A 42-year-old male presents with tiredness and central weight gain, two years after having undergone pituitary surgery for a non-functional pituitary tumour.

He has otherwise recovered from his pituitary surgery well, has been found to have complete anterior hypopituitarism and is receiving stable replacement therapy with testosterone monthly injections, thyroxine and hydrocortisone.

On examination there are no specific abnormalities, his vision is 6/9 in both eyes and he has no visual field defects. From his notes you see that he has gained 8 kg in weight over the last six months and his BMI is 31 kg/m². His blood pressure is 122/72 mmHg.

Thyroid function tests and testosterone concentrations have been normal. A post-operative MRI scan report shows that the pituitary tumour has been adequately cleared with no residual tissue.

Which of the following is the likely cause of his current symptoms?

- 1- Aldosterone deficiency
- 2- Depression
- 3- DDAVP deficiency
- 4- Growth hormone deficiency
- 5- Somatisation disorder

Answer & Comments

Answer: 4- Growth hormone deficiency

This patient presents with deteriorating tiredness and weight gain after having had

pituitary surgery for a non-functioning pituitary tumour. He has associated anterior hypopituitarism but is receiving appropriate and stable replacement therapy.

However, these symptoms are typical of an untreated adult growth hormone deficiency and reductions in quality of life, reduced energy and detrimental changes in body composition are well recognised. Recent evidence would suggest that GH replacement therapy in addition to his current replacement therapy does improve symptoms and quality of life and is endorsed by NICE guidance.

The renin-aldosterone system is independent of the hypothalamo-pituitary axis and therefore aldosterone is not necessary.

The patient does not have any symptoms of thirst or polyuria and therefore vasopressin deficiency is also an unlikely cause of his problems.

Whilst depression or somatisation are possibilities it is important to recognise that the symptoms of tiredness and the weight gain is more in keeping with GH deficiency and no other features of either of the former diagnoses are suggested.



[Q: 2120] OnExamination 2012 - Endocrinology

A 51-year-old man with type 2 diabetes and no previous history of CHD presents at annual review.

Currently he is taking metformin 500 mg bd, aspirin 75 mg od, perindopril 4 mg od and simvastatin 20 mg od.

On examination, his blood pressure is 140/72 mmHg, he has background diabetic retinopathy and has a peripheral sensory neuropathy to light touch in the feet.

Investigations reveal:

HbA1c 7.1 % or 54 mmol/mol (3.8-6.4 or 18-46)

Total cholesterol 3.9 mmol/L (<5.2)

Triglyceride 2.5 mmol/L(0.45-1.69)

HDL-cholesterol 0.8 mmol/L(>1.55)

LDL-cholesterol 2.1 mmol/L(<3.36)

Which treatment option will further improve this patient's dyslipidaemia?

- 1- Cholestyramine
- 2- Ezetimibe
- 3- Fenofibrate
- 4- No other treatment required
- 5- Rosuvastatin

Answer & Comments

Answer: 3- Fenofibrate

This patient's TC and LDL-C are at the currently advocated target levels.

Patients with T2DM commonly have low HDL-C and elevated triglycerides (TG). In some patients, TG may improve with stricter glycaemic control.

The role of HDL-C and triglycerides in cardiovascular risk remains unclear. Some authorities advocate desirable HDL-C levels > 1 mmol/l and plasma TG < 1.7 mmol/l in subjects at risk of cardiovascular disease (CVD).

The FIELD study assessed the effects of fenofibrate therapy on CV mortality in patients with type 2 diabetes. Although the primary end-point of CV mortality was not achieved partly due to high use of non-study lipid lowering therapies (statin use was much higher in placebo group 34% versus 18% in fenofibrate), the composite endpoint of major CVD events was significantly reduced with fenofibrate.

Furthermore, at any given LDL or TC level, reduced HDL-C is associated with an increased CHD risk.

Fenofibrate increases HDL-C by 10-15% and reduces plasma TG by 15-20%.

Concomitant fibrate-statin use is associated with an increased risk of myopathy so evaluation of combination therapy for safety and tolerability is important.

When evaluating a patient with hypertriglyceridaemia, secondary causes need to be considered. These include hypothyroidism and poorly controlled diabetes as well as excess alcohol intake.



[Q: 2121] OnExamination 2012 - Endocrinology

A 22-year-old female student presents acutely unwell with vomiting and dehydration. She has a two month history of weight loss and thirst.

Investigations confirm a diagnosis of diabetic ketoacidosis with a glucose of 29.3 mmol/L (3.0-6.0), a pH of 7.12 (7.36-7.44) on blood gas analysis and urinalysis reveals +++ ketones.

What percentage of type 1 diabetics are initially diagnosed following presentation with diabetic ketoacidosis?

- 1- 5%
- 2- 10%
- 3- 15%
- 4- 25%
- 5- 40%

Answer & Comments

Answer: 4- 25%

Approximately 25% of patients with type 1 diabetes will first present in diabetic ketoacidosis although often there are symptoms such as thirst, polyuria and weight loss which have been ignored.



[Q: 2122] OnExamination 2012 - Endocrinology

An 80-year-old woman with type 2 diabetes mellitus is referred with weakness.

She had been taking bendroflumethiazide, digoxin and tolbutamide.

On examination she had a temperature of 37.8°C, a pulse of 98 bpm in atrial fibrillation, and a blood pressure of 118/72 mmHg.

Investigations show:

Sodium 121 mmol/L (137-144)

Potassium 3.3 mmol/L (3.5-4.9)

Urea 4.8 mmol/L (2.5-7.5)

Creatinine 83 µmol/L (60-110)

Glucose 15.2 mmol/L (3.0-6.0)

Chest x ray Normal

What is the most likely cause for the hyponatraemia?

- 1- Addison's disease
- 2- Bendroflumethiazide
- 3- Hyperglycaemia
- 4- Syndrome of inappropriate secretion of antidiuretic hormone (SIADH)
- 5- Tolbutamide

Answer & Comments

Answer: 2- Bendroflumethiazide

This patient has hyponatraemia and hypokalaemia. This is probably due to the bendroflumethiazide which should be stopped.

It is unlikely to be SIADH, of which tolbutamide is a cause, as the hypokalaemia is not typically associated.

Her hyperglycaemia with an osmotic diuresis would cause dehydration.

Addison's disease would be associated with hyperkalaemia, hypotension and elevated urea.



[Q: 2123] OnExamination 2012 - Endocrinology

Which of the following is not a feature of zinc

deficiency?

- 1- Dwarfism
- 2- Geophagia
- 3- Hepatosplenomegaly
- 4- Hypertelorism
- 5- Hypogonadism

Answer & Comments

Answer: 4- Hypertelorism

Zinc deficiency is associated with:

Dwarfism

Hypogonadism

Hepatosplenomegaly

Rough and dry skin

Mental lethargy and

Geophagia.

Zinc supplementation has been shown to improve neuropsychological function in Chinese children.

Zinc deficiency is associated with adverse pregnancy outcomes.



[Q: 2124] OnExamination 2012 - Endocrinology

A 29-year-old female presents with headaches.

She is noted to be hypertensive with a blood pressure of 180/100 mmHg and initial investigations reveal a hypokalaemia of 2.9 mmol/L (3.5-4.9). On closer questioning she is found to consume a large quantity of liquorice.

Inhibition of which enzyme is responsible for the pseudohyperaldosteronism associated with liquorice?

- 1- 17 Alpha hydroxylase (17αOH)
- 2- 5 Alpha-reductase

- 3- 11 Beta hydroxylase (11 bOH)
 4- 11 Beta hydroxysteroid dehydrogenase (11 bHSD)
 5- 21 Hydroxylase

Answer & Comments

Answer: 4- 11 Beta hydroxysteroid dehydrogenase (11 bHSD)

11bHSD is responsible for the conversion of cortisol to the inactive cortisone, preventing activation of the mineralocorticoid receptor by cortisol but permitting activation by aldosterone.

Both liquorice and carbenoxolone inhibit 11bHSD and produce pseudohyperaldosteronism with hypertension and hypokalaemia yet appropriately low renin and aldosterone concentrations.

Much research is focused upon this enzyme of late.



[Q: 2125] OnExamination 2012 - Endocrinology

Useful therapy for improving fertility in polycystic ovarian syndrome (PCOS) includes which of the following?

- 1- Cyproterone acetate
 2- Ethinylloestradiol
 3- Glibenclamide
 4- Metformin
 5- Spironolactone

Answer & Comments

Answer: 4- Metformin

Metformin has been shown to increase the rate of conception in PCOs through improved insulin sensitivity.

Ethinylloestradiol and cyproterone acetate combine to form Dianette the oral contraceptive. Cyproterone acetate is also

used as an anti-androgen for hormonal treatment of prostatic carcinoma.

Spironolactone is used for hirsutism but is teratogenic.

Glibenclamide is not used in PCOs.



[Q: 2126] OnExamination 2012 - Endocrinology

A 32-year-old woman presents with a four month history of amenorrhoea.

She takes no specific therapy. She has two children and her husband has had a vasectomy.

Examination reveals an obese individual but no other abnormality.

Investigations show:

Serum oestradiol 100 pmol/L(130-500)

Serum LH 2.1 mU/L(3.0-6.6)

Serum FSH 2.2 mU/L(3.3-10.1)

Serum prolactin 800 mU/L(50-500)

Serum testosterone 2.1 pmol/L(<3.0)

Which investigation is the most appropriate?

- 1- 17 hydroxy-progesterone
 2- Insulin tolerance test
 3- Magnetic resonance imaging (MRI) of the pituitary
 4- Pregnancy test
 5- Urine free cortisol concentration

Answer & Comments

Answer: 3- Magnetic resonance imaging (MRI) of the pituitary

This patient has hypogonadotrophic hypogonadism as evidenced by suppressed luteinising hormone/follicle-stimulating hormone (LH/FSH) and a low oestradiol concentration.

This would exclude pregnancy as a cause and polycystic ovarian syndrome is also unlikely.

In the presence of a raised prolactin concentration, a microprolactinoma would be the most likely explanation for this patient's symptoms and results.

This may be demonstrated by a pituitary MRI scan.

An insulin tolerance test would usually be entirely normal in a microprolactinoma.



[Q: 2127] OnExamination 2012 - Endocrinology

An 18-year-old woman presents with hirsutism and oligomenorrhoea. She is concerned as this has provoked bullying at the college where she goes.

On examination her BP is 115/82 mmHg, pulse is 75 and regular, her BMI is 29. She has obvious male pattern facial hair, hair around her upper chest and areolae, and hair over her lower abdomen. She also has oily skin with evidence of facial acne.

Investigations show:

Haemoglobin 13.2 g/dl(11.5-16.0)

White cell count $6.0 \times 10^9/L$ (4-11)

Platelets $158 \times 10^9/L$ (150-400)

Sodium 135 mmol/l (135-146)

Potassium 4.7 mmol/l (3.5-5)

Creatinine 90 $\mu\text{mol/l}$ (79-118)

17-OH progesterone elevated

Which of the following is the most appropriate therapy for her?

- 1- Flutamide
- 2- Hydrocortisone
- 3- Metformin
- 4- Pioglitazone
- 5- Weight loss

Answer & Comments

Answer: 1- Flutamide

Hydrocortisone is not required in the treatment of non-classical congenital adrenal hyperplasia.

Metformin, pioglitazone and weight loss are all therapies which may increase insulin sensitivity in the context of polycystic ovarian syndrome.

Although this woman may benefit per se from weight loss, she is likely to derive most symptomatic benefit from an anti-androgen.



[Q: 2128] OnExamination 2012 - Endocrinology

A 29-year-old man comes to the endocrine clinic for review of his hypertension. He is currently taking ramipril and amlodipine but his BP is still elevated.

On examination his BP is 155/95 mmHg, pulse is 70 and regular, respiratory and abdominal examination is unremarkable.

Investigations show:

Haemoglobin 13.8 g/dl(13.5-17.7)

White cell count $6.9 \times 10^9/L$ (4-11)

Platelets $181 \times 10^9/L$ (150-400)

Sodium 143 mmol/l (135-146)

Potassium 3.1 mmol/l (3.5-5)

Creatinine 110 $\mu\text{mol/l}$ (79-118)

Ultrasoundleft adrenal mass

Which of the following is the most appropriate agent to help manage his blood pressure pre-operatively?

- 1- Amiloride
- 2- Furosemide
- 3- Indapamide
- 4- Spironolactone
- 5- Valsartan

Answer & Comments

Answer: 4- Spironolactone

Amiloride may be useful in treating hypokalaemia, but it is not a mineralocorticoid antagonist, as such it is not the correct choice here.

Indapamide may have utility as an anti-hypertensive agent, but it may worsen hypokalaemia.

Furosemide is a more effective treatment for heart failure than blood pressure.

Valsartan is less effective than spironolactone in reducing blood pressure in this situation.



[Q: 2129] OnExamination 2012 - Endocrinology

You are reviewing chemical pathology results which have come to your acute medicine inbox and are collecting a series from patients with chronic respiratory failure.

Which of the following would fit best with a compensated respiratory acidosis?

- 1- pH 7.41, pCO₂ 7.2kPa, pO₂ 9.2kPa
- 2- pH 7.1, pCO₂ 3.9kPa, pO₂ 8.8kPa
- 3- pH 7.54, pCO₂ 4.2 kPa, pO₂ 12.9kPa
- 4- pH 7.3, pCO₂ 3.8kPa, pO₂ 13.0kPa
- 5- pH 6.9, pCO₂ 3.4, pO₂ 8.2

Answer & Comments

Answer: 1- pH 7.41, pCO₂ 7.2kPa, pO₂ 9.2kPa

Option A is correct. For all of the other options the pH values are abnormal.

B, D and E are consistent with a metabolic acidosis, B and E also with significant hypoxia.

C is consistent with a metabolic alkalosis.



[Q: 2130] OnExamination 2012 - Endocrinology

A 45-year-old woman presents with chronic diarrhoea.

This has worsened over the past six months so that she is opening her bowels up to eight times per day with watery motions. The stool is normal smelling and tea coloured without blood or mucus. Her GP has been encouraging her to use codeine and loperamide to manage her symptoms.

On examination her BP is 110/70 mmHg, pulse is 65 and regular and her BMI is 21. General physical examination is unremarkable.

Investigations show:

Haemoglobin 11.0 g/dl(11.5-16.0)

White cell count 6.8 x 10⁹/L (4-11)

Platelets 203 x 10⁹/L (150-400)

Sodium 141 mmol/l (135-146)

Potassium 3.0 mmol/l (3.5-5)

Bicarbonate 15 mmol/l (22-30)

Creatinine 83 µmol/l (79-118)

Abdominal ultrasound Pancreatic mass

Which of the following is the most appropriate medical management of her diarrhoea?

- 1- Bromocriptine
- 2- Cholestyramine
- 3- Codeine
- 4- Somatostatin analogue
- 5- Somatotrophin analogue

Answer & Comments

Answer: 4- Somatostatin analogue

The most likely diagnosis here is VIPoma, therefore therapy should be targetted at this as the underlying cause, with somatostatin or an analogue the most appropriate option.

Bromocriptine is a dopamine agonist which can be used in the treatment of prolactinoma.

Cholestyramine is a bile acid sequestrant that can be used in the management of diarrhoea related to small bowel malabsorption or pancreatitis.

Codeine prolongs small bowel transit time and increases stool water absorption, it may be an adjunct in patients who do not adequately respond to somatostatin.

Somatotrophin is growth hormone, and has no place in managing the condition.



[Q: 2131] OnExamination 2012 - Endocrinology

A 62-year-old woman is admitted with progressive confusion and decreasing consciousness to the Emergency department.

On examination she is cold with a temperature of 35.2°C. Her BP is 100/60 mmHg and her pulse is 51. She has periorbital oedema on examination of her face; the most striking neurological abnormality is slow relaxing reflexes.

You notice on her laboratory records there is a TSH recorded at 11.2 some two months earlier. Her hospital notes record that she has recently started treatment for TB.

Which of the following agents is most likely to be responsible?

- 1- Ethambutol
- 2- Isoniazid
- 3- Pyrazinamide
- 4- Rifampicin
- 5- Streptomycin

Answer & Comments

Answer: 4- Rifampicin

Isoniazid

Pyrazinamide

Streptomycin and

Ethambutol

are not known to interfere with thyroxine absorption, and so cannot be the correct options here.



[Q: 2132] OnExamination 2012 - Endocrinology

You are trialling a new partial agonist of the vitamin D receptor and are hoping that it may share only some of the attributes of vitamin D3 itself.

Which of the following is a property of vitamin D?

- 1- Down regulates calbindin
- 2- Reduces intestinal calcium absorption
- 3- Reduces osteocalcin expression
- 4- Reduces phosphate absorption
- 5- Suppresses synthesis of type 1 collagen

Answer & Comments

Answer: 5- Suppresses synthesis of type 1 collagen

Calbindin is an intestinal transporter of calcium, and by upregulating calbindin expression, vitamin D leads to increased calcium absorption from the small intestine.

In addition to stimulating intestinal calcium absorption, vitamin D also stimulates absorption of magnesium and phosphate.



[Q: 2133] OnExamination 2012 - Endocrinology

A 25-year-old woman comes for a discussion about contraception some four weeks after she has given birth to her first child.

She complains that her hair seems to be falling out excessively when she brushes it. There is no medical history of note and she is coping well with caring for her baby.

On examination her BP is 105/70 mmHg, her BMI is 26.

Investigations show:

Haemoglobin 10.8 g/dl(11.5-16.0)

White cell count $6.9 \times 10^9/L$ (4-11)

Platelets $181 \times 10^9/L$ (150-400)

Sodium 137 mmol/l (135-146)

Potassium 4.0 mmol/l (3.5-5)

Creatinine 102 micromol/l (79-118)

Which of the following is the most appropriate initial management?

- 1- LH/FSH ratio
- 2- Reassurance
- 3- Testosterone
- 4- Thyroid hormone testing
- 5- Topical minoxidil

Answer & Comments

Answer: 2- Reassurance

The most likely explanation here is that an abnormal number of hairs have entered the telogen phase. This results in shedding of hair leading to loss of thickness. It occurs as a normal phenomenon one to three months after pregnancy. No treatment is required and hair thickness eventually recovers without further intervention.

Luteinising hormone/ follicle-stimulating hormone (LH/FSH) ratio and testosterone are both potential tests which could be considered if polycystic ovary syndrome (PCOS) or another condition leading to androgenic alopecia were considered. We are given no evidence of that in the scenario, accordingly they are not appropriate.

Equally, we are not told of weight gain or lethargy, hence thyroid function testing would not be a first choice.

Topical minoxidil is a therapy which promotes hair regrowth, but it is not required here.



[Q: 2134] OnExamination 2012 - Endocrinology

A 53-year-old woman comes to the clinic for review.

She is obese and has a history of hypertension which is managed with ramipril and amlodipine. Her blood pressure is 155/85 mmHg. Her BMI is 29.

Which of the following most accurately predicts her level of insulin resistance?

- 1- Blood pressure
- 2- BMI
- 3- HDL cholesterol
- 4- LDL cholesterol
- 5- Triglyceride / HDL ratio

Answer & Comments

Answer: 5- Triglyceride / HDL ratio

The answer is E, triglyceride / HDL ratio.

Cross-sectional studies across the Caucasian population have suggested that triglyceride/HDL ratio is most predictive of insulin resistance. As such TG/HDL can be used to stratify both future risk of the development of cardiovascular disease and future risk of diabetes mellitus.

Weight loss and exercise training is seen to impact on TG/HDL ratio; pioglitazone and metformin which impact on insulin resistance both lead to modest increases in HDL and a decrease in triglycerides in some patients.



[Q: 2135] OnExamination 2012 - Endocrinology

A 71-year-old man presents with chronic back and right hip pain which has been increasingly affecting him over the past few months. He finds it very difficult to mobilise in the mornings, and cannot dig his garden.

Clinical examination is unremarkable, apart from limitation of right hip flexion due to pain.

Investigations show

Haemoglobin 12.1 g/dl (13.5-17.7)

White cell count $8.2 \times 10^9/L$ (4-11)

Platelets $200 \times 10^9/L$ (150-400)
 C reactive protein 9 nmol/l (<10)
 ESR 15 mm/hr (<20)
 Sodium 140 mmol/l (135-146)
 Potassium 3.9 mmol/l (3.5-5)
 Creatinine 92 $\mu\text{mol/l}$ (79-118)
 Alanine aminotransferase 12 U/l (5-40)
 Alkaline phosphatase 724 U/l (39-117)
 Calcium 2.55 mmol/l (2.20-2.67)

Which of the following is the most likely diagnosis?

- 1- Chronic liver disease
- 2- Malignant melanoma
- 3- Osteoarthritis right hip
- 4- Osteoporotic collapse lumbar spine
- 5- Paget's disease

Answer & Comments

Answer: 5- Paget's disease

This man's markedly elevated alkaline phosphatase in the presence of normal liver enzymes, normal calcium and normal ESR, and his history of lumbar spine and right hip pain points towards Paget's disease as the most likely diagnosis.

x Ray examination of his lumbar spine and hip is likely to show areas of both osteolysis and new bone formation typical of the disease.

Pain relief with non-steroidals, and either oral or intermittent IV pulsed bisphosphonate therapy represents the treatment of choice.



[Q: 2136] OnExamination 2012 - Endocrinology

A 21-year-old man with known sickle cell anaemia comes to the Emergency department with increasing shortness of breath which is now so bad that he is unable to walk.

He says a few days earlier there were symptoms of a non-specific mild flu-like illness but nothing else of note.

On examination his BP is 124/72 mmHg, pulse is 95. He has severe left ventricular failure. Blood gas examination reveals an Hb of 6.4 g/dl.

Which of the following is most likely to be responsible?

- 1- Coxsackie B virus
- 2- Cytomegalovirus
- 3- Epstein-Barr virus
- 4- Influenza A
- 5- Parvovirus B19

Answer & Comments

Answer: 5- Parvovirus B19

Parvovirus B19 is known to be associated with aplastic crises in sickle cell anaemia which can precipitate severe anaemia and subsequent cardiac failure. Recovery may be spontaneous over the course of a few weeks, but transfusion, particularly when there is associated cardiac failure is usually required.

Whilst the other viruses listed may contribute to myocardial dysfunction and as such could precipitate cardiac failure, they are not associated with aplastic crisis in sickle cell.

Therefore it is parvovirus which is the only possible correct answer here.



[Q: 2137] OnExamination 2012 - Endocrinology

A 45-year-old man presents with an ulcer on his right foot.

He has a 20 year history of type 1 diabetes and currently uses mixed insulin twice daily.

On examination he has a small ulcer of approximately 2 cm diameter on the outer aspect of his right big toe.

His peripheral pulses are all palpable but he has a peripheral neuropathy to the mid shins.

The ulcer has an erythematous margin and is covered by pus.

What is the most likely infective organism?

- 1- Escherichia coli
- 2- MRSA
- 3- Pseudomonas aeruginosa
- 4- Staphylococcus aureus
- 5- Streptococcus pyogenes

Answer & Comments

Answer: 4- Staphylococcus aureus

Diabetic foot ulcers can be divided into:

Those in neuropathic feet and

Those in feet with ischaemia.

The neuropathic foot is warm and well perfused with palpable pulses, sweating is decreased and the skin may be dry and prone to fissures.

The ischaemic foot is cool and pulseless with thin, shiny skin which often lacks hair. There may also be atrophy of the subcutaneous tissues, but intermittent claudication and rest pain may be absent due to co-existent neuropathy.

Diabetic foot infections are common and always serious, and range in severity from superficial paronychia to deep infection and gangrene.

Other manifestations include:

Cellulitis

Myositis

Abscesses

Necrotising fasciitis

Septic arthritis

Tendonitis

Osteomyelitis.

All are associated with increased frequency and length of hospitalisation, and risk of lower extremity amputation.

Neuropathy, vascular insufficiency and reduced neutrophil function all mean that diabetics are more susceptible to foot ulceration.

Once skin ulceration occurs, the underlying tissues are exposed to colonisation by pathogenic organisms. The inflammatory response is often impaired, and therefore early signs of infection may be subtle. Local signs of wound infection are:

Granulation tissue that becomes increasingly friable

Yellow or grey moist tissue at the base of the ulcer

Purulent discharge and

An unpleasant odour.

The most common pathogens in acute, previously untreated superficial ulcers in diabetic patients are aerobic Gram positive bacteria (particularly Staphylococcus aureus and beta-haemolytic Streptococci).

In patients who have recently received antibiotics or who have deep tissue involvement, infection is usually caused by a mixture of aerobic Gram positive, Gram negative (for example, Escherichia coli, Proteus, Klebsiella) and anaerobic organisms (for example, Bacteroides, Clostridium).

Methicillin-resistant Staphylococcus aureus (MRSA) is more common in patients who have been previously hospitalised or who have received antibiotic therapy, although increasingly it is community acquired.

If infection is suspected, deep swab and tissue samples should be sent for culture and broad-spectrum antibiotics started. The presence of deep infection with abscess, cellulitis

gangrene or osteomyelitis is an indication for hospitalisation.

Indications for urgent surgical intervention are:

A large area of infected sloughy tissue

Localised fluctuance and expression of pus

Crepitus in the soft tissues on radiological examination

Purplish discolouration of the skin (which indicates subcutaneous necrosis).

Antibiotic treatment should subsequently be tailored according to the clinical response, culture results and sensitivity. If osteomyelitis is present, surgical resection should be considered and antibiotics continued for four to six weeks.



[Q: 2138] OnExamination 2012 - Endocrinology

A 26-year-old man with a past history of parathyroid surgery presented with galactorrhoea.

Investigations showed:

Plasma follicle-stimulating hormone 4.2 U/L (1-7)

Plasma luteinising hormone 5.6 U/L (1-10)

Plasma prolactin 1654 mU/L (<360)

Plasma thyroid-stimulating hormone 3.8 mU/L (0.4-5)

Insulin-like growth factor 133.4 nmol/L (7.5-37.3)

Which of the following is the most likely diagnosis?

- 1- MEN type 1
- 2- MEN type 2a
- 3- MEN type 2b
- 4- Polyglandular syndrome type 1
- 5- Polyglandular syndrome type 2

Answer & Comments

Answer: 1- MEN type 1

The story of galactorrhoea suggests hyperprolactinaemia and in the context of primary hyperparathyroidism suggests MEN type 1.

MEN type 1 is an autosomal dominant condition and is associated with hyperparathyroidism, pancreatic neuroendocrine tumours and pituitary tumours.



[Q: 2139] OnExamination 2012 - Endocrinology

A middle-aged woman presents with new onset palpitations. She also commented that she had lost weight recently despite an increased appetite.

Examination reveals a goitre and a degree of exophthalmos. During physical examination, she fell unconscious. Blood pressure was 70/40 mmHg. Electrocardiogram revealed atrial fibrillation (AF) with rapid ventricular response.

What is the appropriate immediate management?

- 1- Anticoagulation
- 2- Carbimazole
- 3- DC cardioversion
- 4- Intravenous amiodarone
- 5- Intravenous propranolol

Answer & Comments

Answer: 3- DC cardioversion

The patient is haemodynamically compromised due to AF.

The emergency management is DC cardioversion 200 J ? 360 J ? 360 J.

Adverse signs necessitating DC cardioversion are:

BP ?90 mmHg

Chest pain

Heart failure

Impaired consciousness

Heart rate ?200 bpm.



[Q: 2140] OnExamination 2012 - Endocrinology

A 24-year-old female presents with a two week history of polyuria and polydipsia together with frequent nocturia.

Investigations show

Serum Sodium 144 mmol/L (137-144)

Serum Potassium 3.3 mmol/L (3.5-4.9)

Serum Calcium 2.6 mmol/L (2.2-2.6)

Plasma glucose 6.8 mmol/L (3.0-6.0)

Serum osmolality 310 mOsmol/L (275-295)

What is the diagnosis?

- 1- Diabetes insipidus
- 2- Diabetes mellitus
- 3- Drug abuse
- 4- Primary hyperparathyroidism
- 5- Primary polydipsia

Answer & Comments

Answer: 3- Drug abuse

This patient has polyuria and polydipsia of relatively recent onset and has an elevated plasma osmolality with a high calcium and glucose concentration.

These features would be unlikely in DI and are more in keeping with thiazide diuretic abuse - high calcium, glucose and hypokalaemia.

Similarly, the serum osmolality would be low in association with primary polydipsia.

There may be plenty of variations purely by alteration of the biochemistry of this question in the examination.



[Q: 2141] OnExamination 2012 - Endocrinology

Maturity onset diabetes of the young (MODY) is due to which of the following?

- 1- BRCA1 and BRCA2 (breast cancer) gene products
- 2- Glucokinase mutations
- 3- HOX (homeobox) gene family
- 4- Leptin mutations
- 5- Stargardt's disease mutations

Answer & Comments

Answer: 2- Glucokinase mutations

MODY is an autosomal dominantly inherited form of diabetes and is due to glucokinase mutations.

Other causes of MODY include hepatocyte nuclear factor (HNF) gene mutations.



[Q: 2142] OnExamination 2012 - Endocrinology

A 17-year-old female who is 16 weeks pregnant reports that her elder brother has vitamin D resistant rickets.

What is the most likely mode of inheritance of this condition?

- 1- Autosomal dominant
- 2- Autosomal dominant with incomplete penetrance
- 3- Autosomal recessive
- 4- X linked dominant
- 5- X linked recessive

Answer & Comments

Answer: 4- X linked dominant

Vitamin D resistant rickets is inherited in an X linked dominant manner.

Therefore an affected female will transmit the disease to 50% of her sons and 50% of her daughters.

An affected male will transmit the condition to all of his daughters but none of his sons.

In this case the mother is unaffected, therefore there is no risk of the condition being passed to her unborn child.



[Q: 2143] OnExamination 2012 - Endocrinology

Which of the findings listed below is true of acromegaly?

- 1- A random growth hormone (GH) concentration may be diagnostically useful
- 2- Growth hormone concentrations are suppressed to normal by bromocriptine therapy
- 3- It is unusual for the pituitary fossa to be enlarged
- 4- Pituitary hormones other than growth hormone are rarely affected
- 5- The majority of patients demonstrate an abnormal glucose tolerance test (GTT)

Answer & Comments

Answer: 5- The majority of patients demonstrate an abnormal glucose tolerance test (GTT)

A Random GH concentrations are pretty useless in the diagnosis of acromegaly, which depends upon non-suppression of GH in the oral glucose tolerance test, in which approximately 50% have either impaired GTT or diabetes.

B GH concentrations seldom suppress to normal with bromocriptine but often respond far better with octreotide.

C Usually at presentation the fossa is enlarged (about 80%).

D This is awkward, but prolactin is often elevated (30%) although hypopituitarism would be unusual unless the tumour is particularly large.



[Q: 2144] OnExamination 2012 - Endocrinology

A 29-year-old woman presents with a one year history of irregular periods, deteriorating hirsutism and weight gain.

Investigations reveal:

Serum testosterone 4 mmol/L (0.5-3)

Serum dehydroepiandrosterone sulphate (DHEAS) 15 µmol/L (0.3-9.3)

Which one of the following statements is most probable for this patient?

- 1- Pituitary gonadotrophins are likely to become suppressed.
- 2- She has an increased risk of multiple pregnancies.
- 3- She is at increased risk of autoimmune disease.
- 4- She is at increased risk of ovarian carcinoma.
- 5- She is likely to develop acanthosis nigricans.

Answer & Comments

Answer: 5- She is likely to develop acanthosis nigricans.

This patient has oligomenorrhoea, weight gain and hirsutism.

The investigations show a modest elevation of androgens and support a diagnosis of polycystic ovarian syndrome.

This condition is associated with insulin resistance and acanthosis nigricans is a feature.



[Q: 2145] OnExamination 2012 - Endocrinology

A 60-year-old female was prescribed thyroxine 150 microgrammes daily for hypothyroidism.

She was clinically hypothyroid and no goitre was present.

She attends a follow up clinic and following are her results:

Serum total T₄ 68 nmol/L (55-145)

Serum total T₃ 0.5 nmol/L (0.9-2.5)

Serum TSH 70 mU/L (0.4-5)

Which of the following would be the next step in her management?

- 1- Investigation for TSH secreting pituitary tumour
- 2- Measurement of free thyroxine concentration
- 3- Questioning of the patient about compliance
- 4- She has sick euthyroid syndrome, no further investigation required
- 5- Thyroid ultrasound scan

Answer & Comments

Answer: 3- Questioning of the patient about compliance

Apart from by the RCP total thyroid hormone levels are now seldom measured.

This patient has a raised thyroid-stimulating hormone but normal total thyroxine (T₄) and a low tri-iodothyronine (T₃).

Either there is a block on the conversion of T₄ to T₃ or as seems more likely the patient has taken the T₄ just prior to coming to clinic.

The explanation is non-compliance.



[Q: 2146] OnExamination 2012 - Endocrinology

A 28-year-old female presents in the 24th week of pregnancy with profound tiredness and anxiety.

Examination reveals a tremor, a pulse of 100 beats per minute and a soft bruit heard over the thyroid gland.

Thyroid function tests show:

Free T₄ 32.9 pmol/L (10-22)

TSH 0.04 mU/L (0.4-5)

Which of the following treatments would you select for this patient?

- 1- Carbimazole
- 2- Lithium
- 3- Potassium perchlorate
- 4- Propranolol
- 5- Radioactive iodine therapy

Answer & Comments

Answer: 1- Carbimazole

This patient has Graves' disease and the most appropriate treatment for the thyrotoxicosis is carbimazole.

This she should receive in the lowest dose to maintain euthyroidism.

A block and replacement regime is not appropriate in pregnancy.

Radioactive iodine is contraindicated as it would also be taken up by the fetal thyroid.

Propranolol would ameliorate the symptoms but may impact upon the fetus.

Lithium is contraindicated in pregnancy as is potassium perchlorate.

Of course surgery may also be used in severe cases.

Both carbimazole and propylthiouracil may (and should) be used in pregnancy. Many

prefer propylthiouracil because there is some evidence that it may be less likely to be transferred across the placenta.



[Q: 2147] OnExamination 2012 - Endocrinology

A 29-year-old woman with a history of type 1 diabetes comes to the endocrine clinic for review. She is very concerned as she has begun to lose significant amounts of hair from a patch on her scalp over the course of the last few months.

On examination she has a circular area of hair loss with an area of normal looking skin in the middle of it. Skin scrapings taken by the GP have not produced any growth.

Which of the following is the most appropriate treatment?

- 1- Griseofulvin
- 2- Intra-lesional triamcinolone
- 3- Oral ciclosporin
- 4- Topical clotrimoxazole
- 5- Topical hydrocortisone

Answer & Comments

Answer: 2- Intra-lesional triamcinolone

Griseofulvin and topical clotrimoxazole are both anti-fungals. With a negative culture specimen and the lack of scarring this is highly unlikely to be due to fungal infection.

Topical hydrocortisone is likely to be ineffective in managing alopecia, and systemic treatment with oral ciclosporin is usually an option when disease is more extensive.



[Q: 2148] OnExamination 2012 - Endocrinology

Low uptake of ^{123}I on the thyroid uptake scan would be an expected finding in which of the following?

- 1- A multi-nodular toxic goitre

- 2- A solitary toxic nodule
- 3- Amiodarone induced thyrotoxicosis type 1
- 4- DeQuervain's thyroiditis
- 5- Graves' thyrotoxicosis

Answer & Comments

Answer: 4- DeQuervain's thyroiditis

DeQuervain's thyroiditis is classically associated with low or absent ^{123}I (or ^{131}I radioactive isotopes of iodine) uptake.

The others will have high or normal uptake.

In particular type 1 amiodarone induced thyrotoxicosis may be distinguished from the thyroiditis of type 2 by the normal or high uptake scan.



[Q: 2149] OnExamination 2012 - Endocrinology

A 35-year-old woman comes to the endocrine clinic for review. She has suffered a left Colle's fracture and attends for osteoporosis assessment.

Which of the following factors would put her at increased risk?

- 1- Early menarche
- 2- Europic ethnic origin
- 3- Family history of osteoporotic fracture
- 4- Five units / week alcohol consumption
- 5- Use of a thiazide

Answer & Comments

Answer: 3- Family history of osteoporotic fracture

Early menarche and late menopause are associated with reduced risk of fracture.

Europic ethnic origin is associated with a reduced risk of osteomalacia versus populations with increased skin pigmentation.

Alcoholism is associated with osteoporosis, whereas alcohol consumption within recommended limits is not.

Thiazide diuretics increase serum calcium and are not associated with risk of osteoporosis.



[Q: 2150] OnExamination 2012 - Endocrinology

A 72-year-old woman presents to the clinic with confusion.

She has a history of hypertension for which she takes bendroflumethiazide and amlodipine.

On examination her BP is 120/70 mmHg, with a postural drop of 10 mmHg and her pulse is 80 and regular. Her BMI is 22. There are no other abnormal findings.

Investigations show:

Haemoglobin 12.2 g/dl(11.5-16.0)

White cell count $7.0 \times 10^9/L$ (4-11)

Platelets $188 \times 10^9/L$ (150-400)

Sodium 124 mmol/l (135-146)

Potassium 3.4 mmol/l (3.5-5)

Creatinine 132 $\mu\text{mol/l}$ (79-118)

Urinary sodium 24 mmol/l (>20)

Which of the following is the most likely diagnosis?

- 1- Addison's disease
- 2- Chronic pyelonephritis
- 3- Hypovolaemia and diuretic use
- 4- Primary polydypsia
- 5- SIADH

Answer & Comments

Answer: 3- Hypovolaemia and diuretic use

Addison's disease is incorrect because relative hyperkalaemia and a longer history of deteriorating health would be expected.

Chronic pyelonephritis would be an alternative diagnosis in the absence of thiazide use.

Syndrome of inappropriate secretion of antidiuretic hormone (SIADH) and primary polydypsia would be associated with euvolaemia.



[Q: 2151] OnExamination 2012 - Endocrinology

A 56-year-old man with a history of type 2 diabetes comes to the clinic for review. He complains of bilateral burning pain and weakness in both thighs, worse on the left than the right, which is unbearable.

He takes metformin and a sulphonylurea to maximal doses for his diabetic control, and has a history of hypertension.

On examination his BP is 148/79 mmHg, pulse is 70 and regular, BMI is 31. There is bilateral loss of sensation in his feet. He has proximal muscle wasting of both lower limbs.

Investigations show:

Haemoglobin 13.5 g/dl(13.5-17.7)

White cell count $8.3 \times 10^9/L$ (4-11)

Platelets $201 \times 10^9/L$ (150-400)

Sodium 142 mmol/l (135-146)

Potassium 4.7 mmol/l (3.5-5)

Creatinine 132 $\mu\text{mol/l}$ (79-118)

HbA1c 9.8%(<5.5)

Which of the following is the most appropriate way to manage the pain and muscle wasting in his thighs?

- 1- Add pioglitazone
- 2- Amitriptyline
- 3- Duloxetine
- 4- Physiotherapy
- 5- Transition to insulin

Answer & Comments

Answer: 5- Transition to insulin

Whilst duloxetine is first line therapy and amitriptyline second line therapy for peripheral diabetic neuropathy, it is improved glycaemic control which has most effect on diabetic amyotrophy, so these are not correct options.

Whilst pioglitazone would improve his diabetic control, his HbA1c is probably too elevated at 9.8% to enable him to reach target on triple oral therapy, therefore it is not the correct option.

Whilst physiotherapy may help regain muscle strength, it is improved glycaemic control which is the most important initial therapeutic intervention.



[Q: 2152] OnExamination 2012 - Endocrinology

A 26-year-old Chinese man is admitted on the acute emergency take. He became very unwell after a squash game, complaining of severe proximal limb weakness. Apparently, he has just begun carbimazole treatment for thyrotoxicosis.

On examination his BP is 125/80 mmHg, pulse is 85 and regular and he looks anxious. He is unable to get up off the bed due to proximal weakness.

Investigations show:

Haemoglobin 13.9 g/dl(13.5-17.7)

White cell count $4.8 \times 10^9/L$ (4-11)

Platelets $192 \times 10^9/L$ (150-400)

Sodium 136 mmol/l (135-146)

Potassium 2.8 mmol/l (3.5-5)

Creatinine 90 $\mu\text{mol/l}$ (79-118)

Which of the following is the most likely diagnosis?

- 1- Guillain-Barre syndrome
- 2- Hyperkalaemic periodic paralysis

3- Hypokalaemic periodic paralysis

4- Myositis

5- Thyrotoxic hypokalaemic periodic paralysis

Answer & Comments

Answer: 5- Thyrotoxic hypokalaemic periodic paralysis

The history given is too acute to be either Guillain-Barre or myositis, with Guillain-Barre associated with weakness developing over a number of days, and myositis taking a more chronic course with muscle tenderness.

Without the presence of thyrotoxicosis, this picture would fit with hypokalaemic periodic paralysis.



[Q: 2153] OnExamination 2012 - Endocrinology

You are looking at a potential inhibitor of gastrin for the treatment of Zollinger-Ellison(ZE) syndrome.

When considering gastrin, which of the following correctly reflects its function or the pathophysiology associated with it?

- 1- Fasting gastrin $>1000 \text{ pg/ml}$ and gastric $\text{pH} < 2$ suggests ZE syndrome
- 2- Gastric mucosal atrophy is usually seen in ZE syndrome
- 3- Gastrin promotes small bowel mucosal growth
- 4- Gastrin receptors do not bind cholecystokinin
- 5- It is secreted by L cells

Answer & Comments

Answer: 1- Fasting gastrin $>1000 \text{ pg/ml}$ and gastric $\text{pH} < 2$ suggests ZE syndrome

Gastrin receptors also bind cholecystokinin and as such are also known as CCK-B receptors.

Gastrin promotes gastric mucosal growth and as such gastric mucosal hypertrophy is seen in the ZE syndrome.

Gastrin is synthesised in G cells which are found in gastric pits, primarily in the antrum of the stomach.



[Q: 2154] OnExamination 2012 - Endocrinology

A 32-year-old woman presents with symptoms of palpitations, anxiety and sleep intolerance. She had a flu-like illness some three weeks prior to presenting, and has tenderness over her neck.

On examination her BP is 145/80 mmHg, her pulse is 100 and regular. She has a fine tremor and tenderness over a smoothly enlarged thyroid gland on palpation. TSH is suppressed at <0.1.

Which of the following is true of her underlying condition?

- 1- There is an association with HLA-B27
- 2- There is an association with HLA-B35
- 3- There is an association with HLA-DR3
- 4- There is an association with HLA-DR4
- 5- There is an association with HLA-DR5

Answer & Comments

Answer: 2- There is an association with HLA-B35

This presentation is typical of that associated with sub-acute or De Quervain's thyroiditis, where flu-like illness is followed by transient hyperthyroidism, then hypothyroidism, then recovery. The gland is diffusely tender, although pain responds to non-steroidal anti-inflammatories. Anti-thyroid drugs have no value in the management of the condition. It is associated with HLA-B35 and it is thought that a viral antigen binds to HLA-B35 molecules on macrophages.

HLA-B27 is associated with inflammatory bowel disease and seronegative arthritis.

DR3 and DR4 are associated with increased risk of type 1 diabetes in particular.

HLA-DR5 is associated with clearance of hepatitis C infection and Hashimoto's thyroiditis.



[Q: 2155] OnExamination 2012 - Endocrinology

A 51-year-old woman with type 2 diabetes managed with BD mixed insulin and metformin comes to the clinic for review.

She is worried as a recent HbA1c has risen from 7.2 to 7.9%, and she has increased in weight by 6 kg.

On examination her BP is 156/88 mmHg, her BMI is 36. She is interested in bariatric surgery.

Which of the following features would most prompt you to refer her?

- 1- BMI in the 35-40 range without attempting conventional weightloss measures
- 2- Failure to lose weight even after intensive weight management intervention
- 3- Inferior MI in the past two months
- 4- Presence of hypertension
- 5- Presence of type 2 diabetes

Answer & Comments

Answer: 2- Failure to lose weight even after intensive weight management intervention

NICE guidelines from 2006 with respect to who should be referred for bariatric surgery indicate patients with a BMI over 40, or those with a BMI between 35 and 40 who have other significant disease such as hypertension or type 2 diabetes.

This is provided that:

All appropriate non-surgical measures have failed to achieve or maintain adequate clinically beneficial weight loss for at least six months

They are receiving or will receive intensive specialist management

They are generally fit for anaesthesia and surgery

They commit to the need for long term follow up.

BMI in the 35-40 range is incorrect because whilst it is a criterion for bariatric surgery, there is no indication she has failed conventional weight reduction measures first.

"Failure to lose weight even after intensive weight management intervention" is the correct answer because in this patient it is a requirement before progressing to bariatric surgery.

Inferior myocardial infarction in the past two months is incorrect because it would be a relative contraindication to anaesthetic.

Hypertension is incorrect because whilst it is a criterion for bariatric surgery patients must have failed to lose weight on other measures first.

Type 2 diabetes is incorrect because whilst it is a criterion for bariatric surgery, patients must have failed to lose weight on other measures first.

Obesity, NICE Clinical Guideline (2006); Obesity: the prevention, identification, assessment and management of overweight and obesity in adults and children. [Note the NICE guide is currently being reviewed]



[Q: 2156] OnExamination 2012 - Endocrinology

A 77-year-old woman comes to the clinic for review. She has suffered a previous Colles' fracture, and has a history of a previous left leg DVT.

She takes a range of medication including omeprazole for severe reflux oesophagitis. A T score was measured at -4.2, and she was unable to tolerate weekly alendronate due to symptoms of indigestion.

Which of the following is the most appropriate alternative for her?

- 1- Daily calcium and vitamin D
- 2- Daily strontium ranelate
- 3- Monthly ibandronate
- 4- Monthly risedronate
- 5- Six monthly denosumab

Answer & Comments

Answer: 5- Six monthly denosumab

This patient falls into the severe osteoporosis range and definitely requires therapy in excess of calcium and vitamin D.

Whilst bisphosphonates can be given monthly, they still cause oesophagitis and are not appropriate here.

Denosumab is a rank ligand inhibitor leading to inhibition of osteoclast activity. It is given by six monthly subcutaneous injection and is associated with a 40% reduction in the risk of hip fracture over three years. It is recommended in NICE guidance for this patient type.

A. Daily calcium and vitamin D are incorrect because they are less effective than bisphosphonates in the treatment of osteoporosis.

B. Strontium ranelate is incorrect because it is associated with increased risk of deep vein thrombosis.

C. Monthly ibandronate is incorrect because it is still associated with symptoms of oesophagitis.

D. Monthly risedronate is incorrect because it is still associated symptoms of oesophagitis.

E. Six monthly denosumab is correct because it is effective in managing osteoporosis in this patient type.



[Q: 2157] OnExamination 2012 - Endocrinology

A 32-year-old man who is overweight is screened for diabetes mellitus because he complains of excessive tiredness and nocturia.

On examination his BMI is 34, his BP is 155/90 mm/Hg.

Investigations show:

Haemoglobin 12.3 g/dl(13.5-18)

White cell count $6.1 \times 10^9/L$ (4-10)

Platelets $212 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (134-143)

Potassium 4.6 mmol/l (3.5-5)

Creatinine 120 $\mu\text{mol/l}$ (60-120)

Fasting glucose 12.9 mmol/l (<7.0)

According to the ADA/EASD consensus algorithm 2006, which of the following is the most appropriate management for him?

- 1- A period of six months diet and lifestyle measures then review
- 2- A period of three months diet and lifestyle measures then review
- 3- BD s/c exenatide injections with diet and lifestyle measures commenced concurrently
- 4- Metformin 500 mg BD commenced with diet and lifestyle measures
- 5- Pioglitazone 30 mg with diet and lifestyle measures commenced concurrently

Answer & Comments

Answer: 4- Metformin 500 mg BD commenced with diet and lifestyle measures

The authors state in their consensus document that over time diet and lifestyle

measures fail to maintain the desired degree of weight loss or glucose control.

For this reason they recommend commencing metformin concurrently with these interventions at the point of diagnosis.

They state the recommendation is made because of metformin's

Glucose-lowering effect without significant hypoglycaemia

Lack of weight gain

Generally high level of acceptance

Low cost.

In patients who cannot take metformin they recommend the use of either a sulphonylurea or insulin.

They do not recommend one of the newer agents such as a glitazone or dipeptidyl peptidase IV (DPPIV) inhibitor as a first line alternative.

Reference:

Nathan et al. 29 (8): 1963. (2006)



[Q: 2158] OnExamination 2012 - Endocrinology

A 29-year-old woman who is 31 weeks pregnant comes to the Emergency Department with severe headaches and palpitations.

She is found to have a blood pressure of 175/94 mmHg. There is no past medical history of note and general physical examination is unremarkable.

Investigations show:

Haemoglobin 11.0 g/dl(11.5-16.0)

White cell count $5.2 \times 10^9/L$ (4-11)

Platelets $203 \times 10^9/L$ (150-400)

Sodium 137 mmol/l (135-146)

Potassium 4.2 mmol/l (3.5-5)

Creatinine 102 $\mu\text{mol/l}$ (79-118)

Abdominal ultrasound - Left adrenal mass

Raised urinary catecholamines

Which of the following is the most appropriate way to manage her?

- 1- Alpha block her then allow the pregnancy to continue to term
- 2- Alpha block her, remove the tumour and allow the pregnancy to continue
- 3- Beta block her, remove the tumour and allow the pregnancy to continue
- 4- Beta block her then allow the pregnancy to continue to term
- 5- Plan for lower segment caesarean section and later surgery for the tumour

Answer & Comments

Answer: 5- Plan for lower segment caesarean section and later surgery for the tumour

Unopposed beta blockade should not be used in the management of pheochromocytoma because of the risk of paradoxical increases in blood pressure, so those options listing beta blockade first are incorrect.

By the time she has reached the third trimester, initial removal of tumour is not an option for the pregnancy to continue, so those options are incorrect.



[Q: 2159] OnExamination 2012 - Endocrinology

A 48-year-old lady with hyperthyroidism was reviewed in the endocrine clinic.

She had initially presented to her general practitioner a month ago with flu-like symptoms and tremulousness. Her thyroid function tests at that time were consistent with hyperthyroidism and she was commenced on propranolol.

On examination, her pulse was 88 beats per minute and regular. She did not have any eye signs. She had a diffuse, tender goitre.

Investigations showed:

Plasma thyroid-stimulating hormone <0.01 mU/l (0.4-5)

Plasma Free T₄ 66 pmol/l (10-22)

Radioactive iodine (RAI) uptake scan revealed less than 2% uptake within the thyroid gland.

What is the most appropriate treatment?

- 1- Carbimazole
- 2- Lugol's iodine
- 3- Prednisolone
- 4- Propylthiouracil
- 5- Thyroidectomy

Answer & Comments

Answer: 3- Prednisolone

This patient is likely to have de Quervain's thyroiditis as suggested by the diffuse tender goitre, hyperthyroidism due to rapid release of pre-formed thyroid hormones and very low uptake on RAI uptake scan.

The most appropriate treatment of de Quervain's thyroiditis is symptomatic control.

B-blockers help control the tremor and anxiety associated with thyrotoxicosis and prednisolone or NSAIDs for the thyroiditis.



[Q: 2160] OnExamination 2012 - Endocrinology

A 64-year-old retired Caucasian solicitor attends the surgery.

He is overweight and takes little exercise. He has been treated for hypertension for five years and is controlled on 5 mg of ramipril. He also takes 20mg of simvastatin for hypercholesterolaemia.

A 75g oral glucose tolerance test was recently performed and gave a result consistent with impaired glucose tolerance (IGT) with a two hour plasma glucose concentration of 9.3 mmol/L (3.0-6.0).

The patient is keen to know what would be his risk of developing type 2 diabetes.

What do you tell him?

- 1- 6% over 6 years
- 2- 10% over 6 years
- 3- 33% over 6 years
- 4- 60% over 6 years
- 5- 100% over 6 years

Answer & Comments

Answer: 3- 33% over 6 years

Individuals with IGT are at significant risk of progression to type 2 diabetes.

A number of studies have looked at the absolute risk of progression from IGT to type 2 diabetes. The large and widely-quoted Hoorn study which looked at 1342 Caucasian non-diabetic subjects found that 33.8% progressed to type 2 diabetes over six years follow up. This increased to 64.5% if individuals had both IGT and impaired fasting glycaemia (IFG).

A similar rate of progression for individuals with IGT was Vaccaro who studied a Caucasian group in Italy.

Intensive lifestyle changes involving diet changes, regular exercise and weight loss have been shown to reduce the rate of progression to type 2 diabetes.



[Q: 2161] OnExamination 2012 - Endocrinology

A 55-year-old obese man with type 2 diabetes mellitus is uncontrolled on diet alone.

Which antidiabetic therapy would increase insulin sensitivity in this patient?

- 1- Acarbose
- 2- Gliclazide
- 3- Glimepiride
- 4- Pioglitazone

5- Repaglinide

Answer & Comments

Answer: 4- Pioglitazone

Of the drugs listed only pioglitazone would boost insulin sensitivity, as would metformin, but pioglitazone has more effect on peripheral insulin resistance.

Gliclazide, glimepiride and repaglinide are insulin secretagogues - they boost insulin secretion. Acarbose has a modest effect on the absorption of sugars from the gut, but its main effect is to cause flatulence.

Type 2 diabetes is due to two defects - insulin resistance and insulin deficiency. In 95% of patients it is insulin resistance that is the main cause of the diabetes. These patients are typically obese with features of the metabolic syndrome. The bulk of the insulin resistance appears to be in skeletal muscle.

The state of insulin resistance is associated with abnormal glucose metabolism (obviously) and excessive free fatty acids in the blood. Drugs and lifestyle modifications that increase insulin sensitivity (and thereby reduce insulin resistance) help to reverse these abnormalities.



[Q: 2162] OnExamination 2012 - Endocrinology

A 53-year-old man with a known history of Graves' disease presents to the Emergency department with palpitations, anxiety and fine tremor of both hands.

ECG shows rapid atrial fibrillation (AF) with ventricular rate of 160 to 180/min.

His blood pressure was 110/80 mmHg.

TSH 0.01 mU/l (0.4-5.0)

Free T₄ 60.3 pmol/l (10-22)

What is the immediate management for this patient?

- 1- Carbimazole
- 2- DC cardioversion
- 3- Digoxin
- 4- Propanolol
- 5- Warfarin

Answer & Comments

Answer: 4- Propanolol

AF occurs in 10% to 25% of patients with hyperthyroidism, more commonly in men and the elderly than in women or patients less than 75-years-old.

In a patient with hyperthyroidism and AF, initial therapy should focus on ventricular rate control with β -blockers, but conversion to sinus rhythm frequently occurs spontaneously with treatment of hyperthyroidism.

AF in thyrotoxicosis is characterised by rapid ventricular response, typically resistant to digoxin therapy.

Electric or pharmacologic cardioversion should be attempted only in euthyroid patients who are haemodynamically unstable.

If AF persists, consideration should be given to anticoagulation in patients who are at risk of embolic events.



[Q: 2163] OnExamination 2012 - Endocrinology

An 17-year-old female presented with a one year history of secondary amenorrhoea. She had been prescribed temazepam and dihydrocodeine previously.

On examination she had galactorrhoea to expression. Her prolactin concentration was 6000 mU/L (50-450). Pregnancy test was negative.

What is the most likely diagnosis?

- 1- Drug-induced hyperprolactinaemia
- 2- Non-functioning pituitary tumour

- 3- Pituitary microadenoma
- 4- Polycystic ovarian syndrome
- 5- Turner's syndrome

Answer & Comments

Answer: 3- Pituitary microadenoma

This patient presents with the classical signs of hyperprolactinaemia, confirmed with the finding of elevated serum levels of prolactin.

There are a number of different causes of hyperprolactinaemia, and it is useful to classify them as below:

1. Hypothalamic stimulation: primary hypothyroidism, adrenal insufficiency.
2. Medications: inhibit dopamine release, leading to reduced inhibition and therefore higher prolactin release.
 - Neuroleptics: phenothiazines, haloperidol
 - Antihypertensives: calcium-channel blockers, methyldopa
 - Psychotropic agents: tricyclic antidepressants
 - Anti-ulcer agents: H₂ antagonists
 - Opiates and opiate antagonists
3. Neurogenic: via autonomic nervous system.
 - Chest wall injury
 - Breast stimulation
 - Breast feeding
4. Physiological causes: via oestrogen stimulation.
 - Pregnancy, coitus
 - Exercise, sleep, stress
5. Increased prolactin production:
 - Ovarian: polycystic ovarian syndrome

- Pituitary tumours: adenomas, hypothalamic stalk interruption, hypophysitis

6. Reduced prolactin elimination:

- Renal failure
- Hepatic insufficiency

The grossly elevated prolactin concentration in this scenario is most suggestive of a microprolactinoma.

This is not polycystic ovarian syndrome as the hyperprolactinaemia is far too high.

The drugs that she is taking would not cause this level of hyperprolactinaemia.

If she were to have a non-functioning pituitary tumour, stalk compression would be expected to produce a prolactin concentration of less than 2000 mU/L.

Prolactin levels can be raised in Turner's syndrome, but you would expect some of the other classical features of the condition to be present.



[Q: 2164] OnExamination 2012 - Endocrinology

A 70-year-old woman presents with a six month history of frontal headaches and weight loss.

On examination a bitemporal hemianopia was noted.

Which of the following suggests the diagnosis of a pituitary tumour?

- 1- 9 am cortisol concentration of 350 nmol/L (200 - 700)
- 2- LH concentration of 44 uL (>30)
- 3- Prolactin concentration of 620 mU/L (50-550)
- 4- Random growth hormone (GH) concentration 1.2 mU/L (< 1 excludes acromegaly)
- 5- TSH concentration of 3.8 mU/L (0.5 - 4.5)

Answer & Comments

Answer: 3- Prolactin concentration of 620 mU/L (50-550)

All of these tests are appropriate in the assessment of a patient with a possible pituitary tumour.

However, the TSH and cortisol are in the reference range so add little to the diagnosis.

The LH is consistent with post-menopausal status in this patient.

As growth hormone exhibits a large degree of diurnal variation, this result also adds little new information. A better test for growth hormone status is often the insulin-like growth factor - 1 (IGF-1). This has much less diurnal variation and is more helpful in the diagnosis of acromegaly or GH deficiency than a random GH level.

Prolactin is elevated which is consistent with a diagnosis of a pituitary tumour. Prolactin can be released in two ways:

Prolactinoma - secreting large amounts of prolactin

Stalk compression - macroadenoma compresses stalk and prevents dopaminergic inhibition of prolactin secretion.

At a level of 620 mU/L, stalk compression is more likely than prolactinoma.

Other causes of elevated prolactin are:

Pregnancy and lactation

Antipsychotic, antidepressant and anticonvulsant medications

Hypothyroidism

After a seizure.



[Q: 2165] OnExamination 2012 - Endocrinology

A patient with type 1 diabetes displays typical symptoms of hypoglycaemic unawareness.

Which of the following statements regarding hypoglycaemic unawareness is correct?

- 1- Alcohol inhibits gluconeogenesis in patients with hypoglycaemia unawareness
- 2- Glucose sensing occurs in the locus caeruleus
- 3- Recurrent hypoglycaemia has no long term consequences on higher cerebral function
- 4- Recurrent hypoglycaemia is most commonly associated with poor diabetic control
- 5- Selective beta-blockers are an important cause of hypoglycaemia unawareness

Answer & Comments

Answer: 1- Alcohol inhibits gluconeogenesis in patients with hypoglycaemia unawareness

Alcohol

Inhibits gluconeogenesis

Decreases peripheral hypoglycaemic responses and

Impairs perception of symptoms of hypoglycaemia.

There is no evidence to suggest that β -blockers cause hypoglycaemic unawareness.

Glucose sensing occurs in the hypothalamus, and there is evidence to suggest that chronic, and recurrent hypoglycaemia may have deleterious effects on higher cerebral function.



[Q: 2166] OnExamination 2012 - Endocrinology

A diagnosis of diabetes mellitus is being considered in 32-year-old woman who is 16 weeks pregnant.

Her body mass index (BMI) was 22 kg/m² (18-25).

A 75 g oral glucose tolerance test (OGTT) was reported as follows:

TimePlasma glucose concentrationNormal range

0 hr 6.0 mmol/l (3.0-6.0)

2 hr 12.5 mmol/l (<11.1)

Which of the following is the most appropriate next step in the management of this patient?

- 1- Glipizide therapy
- 2- Insulin therapy
- 3- Low calorie diet
- 4- Metformin therapy
- 5- Repeat OGTT in four weeks

Answer & Comments

Answer: 4- Metformin therapy

The result confirms a diagnosis of gestational diabetes mellitus (GDM), with the two hour OGTT result above 11.1 mmol/l.

To minimise the fetal consequences of GDM (macrosomia, fetal malformations, still birth, IUGR etc.), the patient's glycaemia should be strictly controlled

A low calorie diet is inappropriate and glipizide is not licensed for use in pregnancy.

With respect to agents for glucose control, a very large trial suggested that metformin is an excellent initial option for therapy, with insulin added in later on top. This is supported by NICE guidance

There is no point in repeating the OGTT in four weeks as control is required now.



[Q: 2167] OnExamination 2012 - Endocrinology

In which of the following conditions would it be expected to find an elevated plasma total cortisol concentration?

- 1- Congenital adrenal hyperplasia
- 2- Patients on long term benzodiazepine therapy

- 3- Patients taking prednisolone
- 4- Pregnancy
- 5- Primary aldosteronism

Answer & Comments

Answer: 4- Pregnancy

Cortisol levels are increased in pregnancy, conditions of physical and emotional stress and drug therapy (oestrogens, oral contraceptives, amphetamines, cortisone, and spironolactone).

Treatment with other forms of steroid lead to decreased levels of cortisol.



[Q: 2168] OnExamination 2012 - Endocrinology

Which one of the following is a recognised feature of achondroplasia?

- 1- Autosomal recessive inheritance
- 2- Increased liability to pathological fractures
- 3- May be diagnosed radiologically at birth
- 4- Shortened spine
- 5- Subfertility

Answer & Comments

Answer: 3- May be diagnosed radiologically at birth

Achondroplasia an autosomal dominant condition and one of the commonest forms of short-limbed dwarfism. It is caused by an activated point-mutation of the fibroblast growth factor receptor 3 (at 4p16.3). The incidence increases with paternal age. Epiphyseal growth cartilage fails, but there is normal bone formation and repair. There is therefore no increased risk of fracture. The homozygous form is usually fatal.

Affected persons have short stature due to shortening of the limbs, but spinal length is maintained. In addition they have

characteristic facies with frontal bossing and mid-face hypoplasia, exaggerated lumbar lordosis, limited elbow extension and trident-like hands. The fingertips may only come down to the iliac crest, and the shortness of the limbs is often most marked proximally. The limbs appear broad with deep creases.

It may be diagnosed radiographically at birth, or becomes obvious within the first year with disparity between a large skull, normal trunk length and short limbs. X-rays show metaphyseal irregularity, flaring in the long bones, and late-appearing irregular epiphyses. The pelvis is narrow in anteroposterior diameter with deep sacroiliac notches and short iliac wings. The spine shows progressive narrowing of the interpedicular distance from top to bottom (reverse of normal).

Subfertility is not associated with achondroplasia.



[Q: 2169] OnExamination 2012 - Endocrinology

A 16-year-old woman presents to the clinic with primary amenorrhoea.

Her only past medical history of note is bilateral inguinal hernias repaired as a baby during a period when she lived abroad. No records are available from that time.

On examination she is 1.65 m in height. There is no evidence of acne or secondary sexual hair. Breasts and her external genitalia look normal.

Investigations show:

Haemoglobin 12.0 g/dl (11.5-16.0)

White cell count $5.3 \times 10^9/L$ (4-11)

Platelets $278 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 4.2 mmol/l (3.5-5)

Creatinine 80 micromol/l (79-118)

Testosterone 9.1 nmol/l (<2.5)

Which of the following is the most likely diagnosis?

- 1- Androgen insensitivity syndrome
- 2- Autoimmune ovarian failure
- 3- Kallman's syndrome
- 4- Klinefelter's syndrome
- 5- Turner's syndrome

Answer & Comments

Answer: 1- Androgen insensitivity syndrome

The testosterone which is in the male range, the history of hernias as a baby and absence of acne or secondary sexual hair are all pointers towards androgen insensitivity syndrome.

The woman will in fact have a male XY karyotype although with breast development and normal external genitalia they appear female.

Cryptorchidism goes hand in hand with the condition, and often it is the testes which herniated through the abdominal wall.

Given the complete absence of menarche, autoimmune ovarian failure is extremely unlikely as it is usually a cause of secondary amenorrhoea. Additionally, the absence of secondary sexual hair counts against this diagnosis.

Klinefelter's is associated with a male phenotype.

Kallman's is associated with loss of sense of smell and failure of secondary sexual development, including breast growth.

Turner's, XO karyotype is associated with a number of other features such as short stature, webbing of the skin around the neck, hypertension and abnormalities of the aorta.



[Q: 2170] OnExamination 2012 - Endocrinology

A 32-year-old male physical education teacher has a three year history of type 1 diabetes.

At the last annual review his HbA1c was 6.8% but he complains of hypoglycaemic events particularly during exercise. He has been commenced on the insulin analogue, lispro insulin.

Compared with conventional short acting insulins what is the advantage of insulin analogue therapy?

- 1- Longer duration of action
- 2- Reduces post-prandial glucose concentrations
- 3- Reduces the incidence of hypoglycaemic events
- 4- Reduces the incidence of long term diabetic complications
- 5- Significant improvement in HbA1c

Answer & Comments

Answer: 2- Reduces post-prandial glucose concentrations

The short acting insulin analogue, lispro, has a rapid onset of action and a shorter duration of action than conventional short acting soluble insulins.

Consequently studies reveal reduced post-prandial glucose concentrations versus soluble insulin and potentially a reduced incidence of hypoglycaemia although the evidence for this is lacking.



[Q: 2171] OnExamination 2012 - Endocrinology

A 33-year-old woman presents to the GP with tiredness and anxiety during the third trimester of her second pregnancy.

Examination is unremarkable, with a BP of 110/70 mmHg and a pulse of 80. Her BMI is 24

and she has an abdomen consistent with a 31 week pregnancy.

The GP decides to check some thyroid function tests.

Which of the following would be considered normal?

- 1- Decreased TSH
- 2- Elevated TSH
- 3- Elevated free T3
- 4- Elevated free T4
- 5- Elevated total T4

Answer & Comments

Answer: 5- Elevated total T4

Decreased thyroid-stimulating hormone (TSH) may be an indicator of thyrotoxicosis or pituitary failure and so would be considered abnormal in this case.

Elevated TSH would be indicative of possible thyroid failure and hypothyroidism.

Elevated free tri-iodothyronine (T3) or thyroxine (T4) would be suggestive of thyrotoxicosis and as such are both abnormal.

Elevated total T4 is normal because of a rise in thyroid binding globulin



[Q: 2172] OnExamination 2012 - Endocrinology

A 29-year-old woman brings her 6-week-old child to the new baby clinic at the GP surgery.

She is concerned as the child has poor suckling and has been admitted to the Emergency department on two occasions with possible bowel obstruction but later discharged. She tells you there is a history in the family of a tumour 'syndrome', and one of her relatives died at a young age.

Which of the following is the most likely underlying diagnosis?

- 1- MEN-1

- 2- MEN-2a
- 3- MEN-2b
- 4- Peutz-Jegher's
- 5- Polycystic kidney disease

Answer & Comments

Answer: 3- MEN-2b

MEN-1 is not associated with mucosal neuromas but is associated with hyperparathyroidism and pancreatic endocrine tumours.

MEN-2a does not present as early as 2b because of the absence of neuromas.

Peutz-Jegher's, whilst being associated with gastrointestinal (GI) hamartomas, presents later in childhood with GI bleeding.

Polycystic kidney disease is associated with cerebral haemorrhage, but is not associated with GI tract pathology in infancy.



[Q: 2173] OnExamination 2012 - Endocrinology

You are planning to start a 72-year-old man who has chronic renal failure and secondary hyperparathyroidism on 1,25-OH vitamin D supplementation.

Which of the following correctly represents an action of 1,25-OH vitamin D supplementation?

- 1- Decreased calcium reabsorption in the kidney
- 2- Decreased IL6 production
- 3- Decreased intestinal reabsorption of calcium
- 4- Decreased mobilisation of calcium from bone
- 5- Decreased muscle strength

Answer & Comments

Answer: 2- Decreased IL6 production

With respect to calcium metabolism, the actions of vitamin D are to increase serum calcium.

This includes increased intestinal absorption of calcium, increased mobilisation of calcium from bone, and increased calcium reabsorption from the kidney.



[Q: 2174] OnExamination 2012 - Endocrinology

A 28-year-old man with type 1 diabetes comes to the clinic with his wife.

They want to know about the aetiology of type 1 diabetes (T1DM) and the chances of any offspring inheriting the disease.

Which of the following accurately represents one aspect of the pathogenesis of T1DM?

- 1- 50% of patients developing the disease have a positive family history
- 2- All patients are ZnT8 autoantibody positive
- 3- Enteroviruses may play a role in protection from and susceptibility to T1DM
- 4- The disease is primarily mediated by pathogenic B cells
- 5- There is 100% twin concordance

Answer & Comments

Answer: 3- Enteroviruses may play a role in protection from and susceptibility to T1DM

Type 1 diabetes is a primarily T cell mediated disorder. Whilst autoantibodies to beta cell antigens are measurable in patients with the disease, they are not thought to play direct role in its pathogenesis.

ZnT8 is found within the beta cell; whilst ZnT8 autoantibodies are often positive in patients with type 1 diabetes, it is not invariable.

Conventionally, anti-GAD and anti-IA2 antibodies are measured to support the diagnosis.

Only 10% of patients have a positive family history, and there is 30-50% twin concordance.



[Q: 2175] OnExamination 2012 - Endocrinology

You are developing a new long acting antidiuretic hormone antagonist for the treatment of SIADH.

Where would you expect to see binding of your antagonist occur?

- 1- Aquaporin 1 channels
- 2- Aquaporin 2 channels
- 3- Aquaporin 3 channels
- 4- V1 receptors
- 5- V2 receptors

Answer & Comments

Answer: 5- V2 receptors

V1 receptors are involved in mediating platelet aggregation and do not have a role in controlling water reabsorption.

There are multiple subtypes of aquaporin channels, some of which, such as aquaporin 3, are involved in passage of water through the skin.



[Q: 2176] OnExamination 2012 - Endocrinology

A 42-year-old man comes to the Emergency department with sudden onset severe retro-orbital headache, nausea and vomiting.

He tells you he has suffered from problems with his vision over the past few days and admits to feeling increasingly tired over the past few weeks.

On examination his BP is 100/60 mmHg, pulse is 90 and regular. He has a right third nerve palsy.

Investigations show:

Haemoglobin 12.9 g/dl(13.5-17.7)

White cell count $5.1 \times 10^9/L$ (4-11)

Platelets $203 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (135-146)

Potassium 4.2 mmol/l (3.5-5)

Creatinine 113 $\mu\text{mol/l}$ (79-118)

Prolactin 1400 mU/l (<400)

TSH 0.2 U/l (0.5-4.5)

Which of the following is the most likely diagnosis?

- 1- Cerebral infarct
- 2- Cluster headache
- 3- Pituitary adenoma
- 4- Pituitary apoplexy
- 5- Subarachnoid haemorrhage

Answer & Comments

Answer: 4- Pituitary apoplexy

The presentation with retro-orbital headache and normal blood pressure means that both cerebral infarction and subarchnoid haemorrhage are less likely.

The abnormal clinical and laboratory findings count against a diagnosis of cluster headache.

Finally, whilst a pituitary adenoma is likely to have pre-dated the presentation here, it is haemorrhage into the gland which has precipitated his attendance at the Emergency department.



[Q: 2177] OnExamination 2012 - Endocrinology

A 48-year-old woman presents with weight gain and lethargy.

She is finding it difficult to hold down her job and has taken sick leave for the past six weeks.

On examination her BP is 150/80 mmHg, her pulse is 52 and she has a BMI of 29. She has thinning hair.

Investigations show:

TSH 9 IU(0.5-4.5)

Free T₄ 10.2 nanomol/l (10-24)

Total cholesterol 6.2 mmol/l (<5.2)

Anti-TPO Antibody positive

Which of the following is the most appropriate treatment?

- 1- Atorvastatin 10 mg
- 2- Carbimazole 10 mg
- 3- Reassurance
- 4- Thyroxine 50 mcg
- 5- Thyroxine 100 mcg

Answer & Comments

Answer: 4- Thyroxine 50 mcg

This patient's symptoms are consistent with subclinical hypothyroidism. She is at significant risk of becoming clinically euthyroid with a thyroxine (T₄) below the lower limit of normal over the next few months.

Her weight gain and lethargy necessitate replacement with low dose thyroxine at this stage, aiming to titrate therapy until the thyroid-stimulating hormone (TSH) is within the normal range.

Atorvastatin is not an appropriate treatment because this patient's raised total cholesterol is likely to be related at least in part to her hypothyroidism which should be treated first.

Carbimazole has no value in the treatment of hypothyroidism.

Reassurance is not appropriate given this patient has symptoms.

100 mcg is too high an initial starting dose for thyroxine, given her T₄ is at the lower limit of the normal range.



[Q: 2178] OnExamination 2012 -
Endocrinology

A 39-year-old woman comes to the clinic complaining of excessive hairiness and problems with acne. She also reports increased libido over the past few months.

There is no medical history of note and she has two healthy children. On examination her BP is 131/82 mmHg, pulse is 75 and regular and her BMI is 25. She has androgenic alopecia and evidence of increased hair around her areolae, upper lip and lower abdomen.

Investigations show:

Haemoglobin 12.2 g/dl(11.5-16.0)

White cell count $4.9 \times 10^9/L$ (4-11)

Platelets $281 \times 10^9/L$ (150-400)

Sodium 140 mmol/l (135-146)

Potassium 3.9 mmol/l (3.5-5)

Creatinine 90 micromol/l (79-118)

Testosterone 8.9 nmol/l (<2.5)

Which of the following is the most likely underlying diagnosis?

- 1- Androgen secreting tumour
- 2- Cushing's disease
- 3- Normal individual
- 4- Obesity related testosterone excess
- 5- Polycystic ovarian syndrome

Answer & Comments

Answer: 1- Androgen secreting tumour

The key here is the testosterone level, which is more than three times the upper limit of normal. As such an androgen secreting tumour must be considered as a possible diagnosis. Abdominal ultrasound, CT or MRI would be follow-on investigations to elucidate whether an adrenal or ovarian tumour is the underlying cause.

This woman is of normal weight and has no features suggestive of Cushing's. Therefore this is not a likely diagnosis, although rarely Cushing's may be associated with hyperandrogenism.

Equally the possibility that she is a normal individual is ruled out by the testosterone level. Whilst obesity and PCOS may be associated with rises in testosterone, it is never to this degree.



[Q: 2179] OnExamination 2012 -
Endocrinology

A 63-year-old man comes to the clinic for review of his type 2 diabetes.

Current medication includes metformin 1 g BD and 30/70 mixed insulin 22U BD. He is also taking lisinopril, amlodipine, atorvastatin and indapamide.

On examination his BP is 147/84 mmHg, his pulse is 77 and regular, and his BMI is 29 kg/m².

Investigations show:

Haemoglobin 13.4 g/dl(13.5-17.7)

White cells $5.3 \times 10^9/l$ (4-11)

Platelet $233 \times 10^9/l$ (150-400)

Sodium 137 mmol/l (135-146)

Potassium 5.0 mmol/l (3.5-5)

Creatinine 127 micromol/l (79-118)

HDL cholesterol 0.7 mmol/l (0.8-1.8)

LDL cholesterol 3.9 mmol/l (<4.0)

Triglycerides 3.6 mmol/l (0.7-2.1)

HbA1c 7.1% (<5.5) (54 mmol/mol (<36))

Which of the following represents the accepted target for fasting triglyceride levels in this patient?

- 1- 1.0 mmol/l
- 2- 1.2 mmol/l
- 3- 1.5 mmol/l
- 4- 1.7 mmol/l

5- 2.1 mmol/l

Answer & Comments

Answer: 4- 1.7 mmol/l

The answer is option D, 1.7 mmol/l.

Despite the fact that the upper limit of the normal range for triglycerides in men is considered to be 2.1, and in women it is 1.7, the JBS2 guidelines recommend a target of 1.7 mmol/l for both men and women. The reason for this is that epidemiological analyses suggest that triglycerides above 1.7 are associated with a 30% relative risk increase with respect to cardiovascular events.

With respect to patients with type 2 diabetes, risk calculators should not be used to estimate 10 year cardiovascular risk when making treatment choices, this is because type 2 diabetes is considered as a secondary prevention equivalent.

As such LDL should be treated to the secondary prevention target of < 2.0 mmol/l and triglycerides to the 1.7 mmol/l target.



[Q: 2180] OnExamination 2012 - Endocrinology

You are asked by your surgical colleagues to comment on current referrals for gynaecomastia at the hospital. They have seen a peak in GP referrals for men in the 60+ age group.

Which of the following underlying diagnoses is most likely to contribute to this peak?

- 1- Cirrhosis
- 2- Drug related gynaecomastia
- 3- Hyperthyroidism
- 4- Renal impairment
- 5- Secondary hypogonadism

Answer & Comments

Answer: 2- Drug related gynaecomastia

Drug related gynaecomastia is said to account for 10-25% of cases, with a number of agents known to cause gynaecomastia such as digoxin and spironolactone having increased use in this age group, this is therefore the most likely cause.

Cirrhosis is a less common cause of gynaecomastia, said to be responsible for around 8% of cases.

Hyperthyroidism is thought to be responsible for 1.5% of cases of gynaecomastia, renal failure around 1%, and secondary hypogonadism around 2% of cases of gynaecomastia.



[Q: 2181] OnExamination 2012 - Endocrinology

A 52-year-old woman with type 2 diabetes comes to the clinic. She has had type 2 diabetes for the past three years and is currently treated with metformin 850 mg twice daily.

On examination her BP is 152/85 mmHg and her BMI is 29.

Investigations show:

Haemoglobin 12.5 g/dl(13.5-18)

White cell count $5.0 \times 10^9/L$ (4-10)

Platelets $199 \times 10^9/L$ (150-400)

Sodium 141 mmol/l (134-143)

Potassium 5.0 mmol/l (3.5-5)

Creatinine 125 $\mu\text{mol/l}$ (60-120)

HbA1c 8.1%(<5.5)

You are planning to add a sulphonylurea to her regime.

Which of the following features, according to the consensus, is true regarding sulphonylurea therapy?

- 1- Delayed onset of glucose lowering effect
- 2- Increased cardiovascular risk
- 3- Low risk of hypoglycaemia

- 4- Synergistic effects when used with DPP-IV inhibitors
- 5- Weight gain

Answer & Comments

Answer: 5- Weight gain

The question of increased cardiovascular risk for sulphonylureas (SUs) was raised after the university group diabetes programme (UGDP) study conducted during the 1970s.

The consensus authors state, however, that the question has since been answered by the UK prospective diabetes study (UKPDS) and ADVANCE studies, where no cardiovascular risk signal was seen for SUs.

Whilst SUs are well known to have a rapid onset of glucose lowering effect, their side-effects of hypoglycaemia and weight gain are well known.

Any synergistic effect with DDP-IV inhibitors is widely debated.



[Q: 2182] OnExamination 2012 - Endocrinology

A study reports on the results of a large study of the primary prevention of stroke in a diabetic population using a new antiplatelet agent versus aspirin.

The results of the study reveal that over a five year period the incidence of stroke in the aspirin treated group is 3%, compared to a rate of 1.5% in the group treated with the new antiplatelet agent ($p < 0.001$).

What is the relative risk reduction in stroke associated with the new drug?

- 1- 1.5%
- 2- 15%
- 3- 30%
- 4- 40%
- 5- 50%

Answer & Comments

Answer: 5- 50%

The relative risk reduction is an important calculation for the interpretation of publications.

In this case there is an absolute risk reduction of 1.5% (3 - 1.5%) in stroke afforded by the new agent compared with aspirin yet the relative risk reduction is $1.5 / 3 = 50\%$.

That is 50% fewer strokes may be prevented by the use of the newer agent compared with aspirin although this would be the equivalent of 15 per 1000 patients treated (30 strokes expected / 1000 patients treated with aspirin but only 15 with the new drug).



[Q: 2183] OnExamination 2012 - Endocrinology

An elderly woman, a known case of longstanding diabetes, presents with right shoulder pain of several months duration. Pain sometimes interferes with sleep.

The shoulder is tender to palpation, and both active and passive movements are restricted. There are no sensory, motor, or reflex changes.

What is the most likely diagnosis?

- 1- Adhesive capsulitis
- 2- Referred pain from subdiaphragmatic irritation
- 3- Rotator cuff tear
- 4- Shoulder dislocation
- 5- Supraspinatus tendinitis

Answer & Comments

Answer: 1- Adhesive capsulitis

Adhesive capsulitis is a recognised musculoskeletal complication of diabetes.

Often referred to as 'frozen shoulder', adhesive capsulitis is characterised by pain

and restricted movement of the shoulder, usually in the absence of intrinsic shoulder disease. Night pain is often present in the affected shoulder.

Adhesive capsulitis occurs more commonly in women after age 50. Pain and stiffness usually develop gradually over several months to a year but progress rapidly in some patients. Pain may interfere with sleep.

The shoulder is tender to palpation, and both active and passive movements are restricted.

Radiographs of the shoulder show osteopenia.

The diagnosis is confirmed by arthrography.



[Q: 2184] OnExamination 2012 - Endocrinology

A 45-year-old woman presents to the clinic with a three month history of sweats and weight gain of 7 kg. Her sweats tend to be worse in the morning and with exercise and she often feels light headed.

On examination she has a BMI of 30 kg/m² but no abnormality is noted. Urinalysis negative.

What is the likely diagnosis?

- 1- Acromegaly
- 2- Diabetes mellitus
- 3- Insulinoma
- 4- Pheochromocytoma
- 5- Primary ovarian failure

Answer & Comments

Answer: 3- Insulinoma

This patient has sweats and weight gain exacerbated by exercise or fasting (in the morning) and associated with lightheadedness. This information suggests the presence of an insulinoma.

Pheochromocytoma is unlikely as there is typically weight loss and there is no mention of hypertension.

If this were acromegaly the features should be described.

In diabetes mellitus per se, possibly urinalysis would be expected to show glycosuria.

Presenting features of insulinoma include:

Double vision

Tachycardia/palpitations

'Weakness'

Confusion

Memory loss

Seizures

Sweating

Hunger

Weight gain.



[Q: 2185] OnExamination 2012 - Endocrinology

A 51-year-old woman presented with nocturia and pruritus vulvae.

Investigations revealed:

Urine dipstick analysis glucose 2%

Which one of the following would most reliably confirm a diagnosis of diabetes mellitus?

- 1- 50 g oral glucose tolerance test
- 2- Elevated glycated haemoglobin concentration
- 3- Fasting plasma glucose of 6.7 mmol/L (3.0-6.0)
- 4- Random plasma glucose of 8.3 mmol/L
- 5- Two hour post-prandial plasma glucose of 12 mmol/L (<11.1)

Answer & Comments

Answer: 5- Two hour post-prandial plasma glucose of 12 mmol/L (<11.1)

The post-prandial glucose gives an equivalent to the 75 g glucose tolerance test which would be one of the investigations of choice in this patient.

None of the other results listed here formally confirm the diagnosis of type 2 diabetes.

The diagnosis of diabetes requires (WHO guidelines):

Fasting plasma glucose >7.0 mmol/l

Random plasma glucose >11.1 mmol/l.

75g OGTT 2-hr plasma glucose >11.1 mmol/l.

The American Diabetes Association have recently added another criterion:

HbA1c >6.5% or 48 mmol/mol.

Diagnosis should generally not be made on a single sample, especially if the patient was unwell as the stress response affects glucose homeostasis.



[Q: 2186] OnExamination 2012 - Endocrinology

A 73-year-old female is diagnosed with Cushing's disease.

Which of the following is correct?

- 1- Adrenalectomy would be the treatment of choice.
- 2- op-DDD is a treatment if unfit for surgery
- 3- Ketoconazole may be used as a treatment if unfit for surgery
- 4- Recurrence of Cushing's disease after transphenoidal surgery is less than 5%
- 5- Yttrium implantation is an effective treatment

Answer & Comments

Answer: 3- Ketoconazole may be used as a treatment if unfit for surgery

Transphenoidal hypophysectomy/adenomectomy would be the initial treatment of choice.

Laparoscopic adrenalectomy would be advised where pituitary surgery has failed.

Ketoconazole may be an effective treatment for patients unfit for surgery.

opDDD is used for adrenal carcinomas.

Yttrium implantation has been abandoned even for acromegaly as it is pretty useless.

The recurrence rate for Cushing's disease after surgery is of the order of 20-30% in most series and depends on the size of the tumour with macroadenomas having a higher rate of relapse.



[Q: 2187] OnExamination 2012 - Endocrinology

Which of the following is a characteristic feature of primary hyperaldosteronism?

- 1- Gross oedema
- 2- Hyponatraemia
- 3- Muscular weakness
- 4- Oliguria
- 5- Vitiligo

Answer & Comments

Answer: 3- Muscular weakness

Primary hyperaldosteronism or Conn's syndrome is characterised by hypokalaemic hypertension.

Patients can present with tetany (alkalosis) and muscle weakness (hypokalaemia).

Oedema and oliguria are more features of secondary hyperaldosteronism (cirrhosis); and vitiligo (suggesting auto-immunity) is not a feature.



[Q: 2188] OnExamination 2012 -

Endocrinology

A 16-year-old girl with obesity was referred with abdominal swelling and mild ankle oedema.

On examination the blood pressure was 140/90 mmHg.

Investigations revealed:

Haemoglobin 10.5 g/dl(11.5-16.5)

Serum biochemistry Normal

Serum albumin 34 g/l (37-49)

Urine dipstick Proteinuria +

Which is the most appropriate investigation that you would request next for this patient?

- 1- 24 hour urinary protein estimation
- 2- Abdominal ultrasound
- 3- Plasma protein electrophoresis
- 4- Urinary albumin: creatinine ratio
- 5- Urinary B-human chorionic gonadotrophin test (B-HCG)

Answer & Comments

Answer: 5- Urinary B-human chorionic gonadotrophin test (B-HCG)

This young girl has been 'gaining weight', has abdominal swelling and ankle oedema.

She is hypertensive and has a mild anaemia with proteinuria.

These signs should 'ring a bell' suggesting a concealed pregnancy with pre-eclampsia.

The most relevant investigation would be a pregnancy test - urinary B-HCG.



[Q: 2189] OnExamination 2012 - Endocrinology

You are consulted by a 52-year-old man with type 2 diabetes diagnosed for one year.

His blood pressure is 156/88 mmHg, his cholesterol is 5.3 mmol/L (<5.2), he has a BMI of 29 kg/m² and does not smoke. His HbA1c is

7.9% (3.8-6.4), he currently takes only metformin 500mg bd.

The single intervention most likely to reduce his overall risk of both microvascular and macrovascular events is:

- 1- Antihypertensive therapy
- 2- Aspirin therapy
- 3- Statin therapy
- 4- Sulphonylurea therapy
- 5- Weight reduction

Answer & Comments

Answer: 1- Antihypertensive therapy

Note this question asks about reducing both micro and macrovascular complications. The best evidence seems to be for multifactorial intensive therapy as in the Steno studies from Denmark. However, in this question, as worded, BP is the simplest answer.

Trials have shown that antihypertensive therapy reduces the risk of cardiovascular events and microvascular complications. The intensity of the treatment is currently of debate.

Lowering HbA1c only resulted in a significant reduction in microvascular events and, in some trials after a longer period, shows cardiovascular benefit. However, the trial showed an excess of deaths in the intensive glycaemic control arm perhaps because the intensification occurred later in the course of the disease when cardiovascular disease was present and may have put participants at increased risk from hypoglycaemia.

Lipid lowering therapy benefits patients with diabetes as much as those without diabetes in preventing macrovascular events in subgroup analyses but has no effect on microvascular events demonstrated so far. Adding fibrate may have an effect on retinopathy.

Aspirin is recommended to type 2 patients with one other cardiovascular risk factor but there is little trial evidence of efficacy.

Weight reduction may reduce progression to overt diabetes from states of impaired glucose tolerance but has not been demonstrated to reduce microvascular risk in diabetes.



[Q: 2190] OnExamination 2012 - Endocrinology

A 54-year-old female presented with a neck swelling which has been more noticeable over the previous four months.

Examination revealed a moderate goitre and clinically she appeared euthyroid.

Investigations revealed:

T₄ 13.1 pmol/L (10-22)

TSH 5.3 mU/L (0.4-5)

Anti -microsomal antibodies Positive

What is the most likely explanation of this patient's goitre?

- 1- Anaplastic thyroid carcinoma
- 2- DeQuervain's thyroiditis
- 3- Graves' disease
- 4- Hashimoto's thyroiditis
- 5- Multi-nodular goitre

Answer & Comments

Answer: 4- Hashimoto's thyroiditis

This patient has goitre with subclinical hypothyroidism, as reflected by elevated thyroid-stimulating hormone but normal thyroxine and elevated microsomal antibodies.

This suggests a diagnosis of Hashimoto's thyroiditis.



[Q: 2191] OnExamination 2012 - Endocrinology

A 58-year-old man who has a history of

hypertension and type 2 diabetes presents to the Emergency department complaining of central chest pain which is going down his left arm.

His medication includes ramipril, metformin, atorvastatin and gliclazide.

On examination his BP is 129/72 mmHg, and his pulse is 81. He has bibasal crackles on auscultation of his chest.

Investigations reveal:

Haemoglobin 13.8 g/dl(13.5-17.7)

White cell count $8.9 \times 10^9/L$ (4-11)

Platelet $197 \times 10^9/L$ (150-400)

Sodium 141 mmol/l (135-146)

Potassium 4.1 mmol/l (3.5-5)

Creatinine 123 $\mu\text{mol/l}$ (79-118)

Glucose 12.3 mmol/l (<7.0)

ECG - Anterolateral ST depression

He is given sublingual GTN.

Which of the following is the next most appropriate therapy?

- 1- Aspirin 300 mg and low molecular weight heparin
- 2- Aspirin 300 mg and clopidogrel 300 mg and low molecular weight heparin
- 3- Beta blockade
- 4- Clopidogrel 300 mg
- 5- IV GTN infusion

Answer & Comments

Answer: 2- Aspirin 300 mg and clopidogrel 300 mg and low molecular weight heparin

The answer is B, aspirin, clopidogrel and low molecular weight heparin.

This patient is high risk given his history of type 2 diabetes mellitus, and as such should be loaded with both aspirin and clopidogrel.

Further chest pain, or failure of his ECG signs to resolve may drive further intervention including progression to angiography.

If this patient does not progress to angiogram then screening for ischaemia should be considered prior to discharge.



[Q: 2192] OnExamination 2012 - Endocrinology

Which of the following is a glycoprotein hormone?

- 1- Cortisol
- 2- Growth hormone releasing hormone
- 3- Oxytocin
- 4- Thyrotropin (TSH)
- 5- Thyrotropin releasing hormone (TRH)

Answer & Comments

Answer: 4- Thyrotropin (TSH)

Thyrotropin is glycosylated, cortisol is a steroid hormone and the others are peptide hormones/neuropeptides which as a group are rarely glycosylated.



[Q: 2193] OnExamination 2012 - Endocrinology

A 72-year-old man is found by his home help in a collapsed state. According to neighbours who spoke to paramedics, he had not been seen outside for some days.

He has a history of hypertension and obesity and takes multiple medications.

On examination his BP is 135/72 mmHg, his pulse is 90 and regular and he is pyrexial 38.2°C. There are signs of a right lower lobe pneumonia.

Investigations show:

Haemoglobin 12.8 g/dl (13.5-17.7)

White cell count $12.9 \times 10^9/L$ (4-11)

Platelets $189 \times 10^9/L$ (150-400)

Sodium 149 mmol/l (135-146)

Potassium 4.2 mmol/l (3.5-5)

Bicarbonate 23 mmol/l (22-30)

Creatinine 172 $\mu\text{mol/l}$ (79-118)

Glucose 42 mmol/l (<7.0)

Which of the following represents the optimal rate at which his glucose should be reduced?

- 1- 1 mmol/hr
- 2- 3 mmol/hr
- 3- 5 mmol/hr
- 4- 7 mmol/hr
- 5- 10 mmol/hr

Answer & Comments

Answer: 2- 3 mmol/hr

Correction at 1 mmol/hr is too slow a correction of blood glucose, and 5 mmol/hr or greater correction of glucose is too rapid.

Individual hospitals usually give sliding scale guidance, but insulin replacement of 0.151 U/kg/hr is recommended as an initial guide.

Fluid management is essential, with replacement tailored to correct significant hyperosmolarity, whilst taking account of pre-existing comorbidities such as underlying cardiovascular disease.



[Q: 2194] OnExamination 2012 - Endocrinology

A 32-year-old woman presents to the endocrine clinic with a lump on the left side of her neck.

TFTs checked by her GP reveal that she is euthyroid. She has no medical history of note and takes the combined oral contraceptive pill.

On examination her BP is 110/70 mmHg, her pulse is 70 and regular, and she has a firm non-painful mass on the left side of her neck.

Investigations show:

Haemoglobin 12.9 g/dl(11.5-16.0)

White cell count $4.9 \times 10^9/L$ (4-11)

Platelets $205 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (135-146)

Potassium 4.0 mmol/l (3.5-5)

Creatinine 99 $\mu\text{mol/l}$ (79-118)

TSH 1.5 IU/l (0.5-4.5)

Fine needle aspiration suggestive of papillary carcinoma

Activation of which of the following proto-oncogenes is most associated with papillary carcinoma of the thyroid?

1- BCL-2

2- BRCA

3- C-myc

4- P53

5- Trk

Answer & Comments

Answer: 5- Trk

BCL-2 is a chemo-attractant protein for human B lymphocytes.

BRCA-1 and 2 oncogene mutations are involved in the familial breast and ovarian cancer syndromes.

P53 mutations knock out a tumour suppressor, leading to cancers across a range of different tissues.

The c-myc protein is a regulator of transcription, therefore c-myc mutations also lead to development of a range of tumours.



[Q: 2195] OnExamination 2012 - Endocrinology

A 25-year-old woman presents to the endocrine clinic with recurrent episodes of collapse. During one of these episodes she is found to have hypoglycaemia with a venous blood glucose of 2.0 mmol/l, coupled with

raised insulin and C peptide. Sulphonylurea screen is negative.

Which of the following other pathologies is most likely to be found?

1- Medullary thyroid carcinoma

2- Neuromas

3- Parathyroid hyperplasia or adenomas

4- Pheochromocytoma

5- Prolactinoma

Answer & Comments

Answer: 3- Parathyroid hyperplasia or adenomas

This patient has an insulinoma, which should lead you to suspect she has multiple endocrine neoplasia type 1. This is the combination of parathyroid hyperplasia or adenoma, pancreatic endocrine tumours and pituitary adenoma. The genetic abnormality is in a proto-oncogene on the long arm of chromosome 11 (11q13), and is autosomal dominant with a high degree of penetrance.

Hyperparathyroidism is the presenting feature in 80% of patients with MEN-1. Pancreatic endocrine tumours are present in 70%, of which 60% are gastrinomas and 30% are insulinomas. 30% of patients have a pituitary prolactinoma diagnosed during life, but is found in closer to 50% at post-mortem.

The association of medullary cell carcinoma of the thyroid and pheochromocytoma is the basis of MEN-2, which has two variants. The genetic defect is within a tumour suppressor gene on chromosome 10q11.2. MEN-2A is also known as Sipple's syndrome, and in addition to medullary cell carcinoma and pheochromocytoma there may also be parathyroid hyperplasia and nephrolithiasis. MEN-2B has the characteristic features of mucosal neuromas and a phenotype resembling Marfan's syndrome. A third variant, which is familial medullary cell carcinoma in isolation, is also recognised.



[Q: 2196] OnExamination 2012 -
Endocrinology

A 69-year-old man is admitted with rapidly worsening nausea, vomiting, polyuria, polydipsia and confusion. He has been treated by his GP for chronic back pain which was thought to be related to his work as a builder.

On examination he is drowsy and confused, his BP is 110/70 mmHg and his pulse is 88 and regular.

Investigations show:

Haemoglobin 13.8 g/dl(13.5-17.7)

White cell count $6.2 \times 10^9/L$ (4-11)

Platelets $186 \times 10^9/L$ (150-400)

Sodium 146 mmol/l (135-146)

Potassium 4.4 mmol/l (3.5-5)

Creatinine 167 $\mu\text{mol/l}$ (79-118)

Urea 13.2 mmol/l (2.5-6.7)

Glucose 5.4 mmol/l (<7.0)

Calcium 3.6 mmol/l (2.20-2.61)

Which of the following is true with respect to his hypercalcaemia?

- 1- A normal alkaline phosphatase would increase suspicion of underlying bony metastases
- 2- A raised alkaline phosphatase would increase suspicion of underlying myeloma
- 3- Abdominal pain is uncommonly seen
- 4- It is likely to be associated with PR prolongation
- 5- It is likely to be associated with QT shortening

Answer & Comments

Answer: 5- It is likely to be associated with QT shortening

Raised alkaline phosphatase associated with hypercalcaemia is more likely to be due to bony metastases; normal alkaline

phosphatase raises the possibility of underlying myeloma.

At this level of calcium, abdominal pain is commonly seen and there is increased risk of acute pancreatitis.



[Q: 2197] OnExamination 2012 -
Endocrinology

A 54-year-old man presents to the clinic for review. He has impaired glucose tolerance.

His blood pressure is currently managed with lisinopril and indapamide, and his BMI is 29. On examination in the clinic his BP is 145/80 mmHg.

Which of the following is the strongest independent predictor of cardiovascular death in a patient with impaired glucose tolerance?

- 1- Blood pressure
- 2- BMI
- 3- LDL cholesterol
- 4- Smoking history
- 5- Triglycerides

Answer & Comments

Answer: 5- Triglycerides

The answer is option E, triglycerides.

Some of the best data for risk assessment in this population come from the Paris prospective study. In the cohort of 943 men who had a diagnosis of either impaired glucose tolerance or type 2 diabetes, triglycerides were seen as the strongest independent risk factor for cardiovascular death, ahead of other more established risk factors such as smoking, body weight or blood pressure.



[Q: 2198] OnExamination 2012 -
Endocrinology

A 61-year-old man with type 2 diabetes comes to the clinic for review.

He is currently managed with metformin 500 mg and gliclazide 40 mg. He is also treated with ramipril 10 mg, amlodipine 5 mg, bisoprolol 5 mg, atorvastatin 10 mg and aspirin 75 mg.

On examination his BP is 140/80 mm hg, his pulse is 70 and his BMI is 28.

Investigations show:

Haemoglobin 12.4 g/dl(13.5-17.7)

White cells $7.2 \times 10^9/L$ (4-11)

Platelet $229 \times 10^9/L$ (150-400)

Sodium 141 mmol/l (135-146)

Potassium 4.9 mmol/l (3.5-5)

Creatinine 123 micromol/l (79-118)

HDL cholesterol 0.7 mmol/l (0.8-1.8)

LDL cholesterol 2.2 mmol/l (<4.0)

Triglycerides 3.4 mmol/l (0.7-2.1)

HbA1c 7.5% (<5.5)(56 mmol/mol (<36))

Which of the following strategies is likely to be most effective in reducing his overall 10 year cardiovascular risk?

- 1- Further anti-hypertensive medication with a target of 130/70 mmHg
- 2- Further hypoglycaemic medication with a target of 6.5%
- 3- Increasing his statin dosage
- 4- Increasing consumption of omega-3 fatty acids
- 5- Weight loss of 5 kg

Answer & Comments

Answer: 4- Increasing consumption of omega-3 fatty acids

The answer is option D, increasing consumption of omega 3 fatty acids.

Elevated triglycerides are common in patients with type 2 diabetes, even in those who are established on effective statin therapy.

His blood pressure is only just above target, and in the absence of probable renal disease, further lowering of his BP may not substantially increase benefit.

A study (ACCORD) suggests that in those with a previous cardiac history, targeting HbA1c reduction to below 7% may be associated with increased sudden death. However, a recent meta-analysis (Ray KK et al, Lancet,2009), concluded that intensive glucose control in type 2 diabetes has no significant effect on all-cause mortality, and a well-designed retrospective study (Currie CJ et al. Lancet 2010) has shown that a HbA1c of about 7.5% has a favourable effect on survival.

The PROCAM, Paris Prospective Study, Copenhagen Male Study and Helsinki Heart Studies have all indicated that elevated triglyceride levels are associated with increased cardiovascular risk, particularly in the presence of low HDL cholesterol, a situation seen most commonly in patients with type 2 diabetes.

Trials of omega 3 supplementation suggest that it is associated with triglyceride reduction of up to 38%.



[Q: 2199] OnExamination 2012 - Endocrinology

A 54-year-old truck driver with a history of type 2 diabetes comes to the clinic for review.

He is concerned as he is finding his sugars hard to keep under control, with morning self-monitored blood glucose sometimes rising as high as 8 mmol/l or more. Current medication for blood sugar control includes metformin 1 g twice daily and gliclazide 160 mg twice daily.

On examination his BP is 148/81 mmHg, his BMI is 29 kg/m².

Investigations show:

Haemoglobin 13.0 g/dl(13.5-18)

White cell count $5.3 \times 10^9/L$ (4-10)

Platelets $231 \times 10^9/L$ (150-400)

Sodium 141 mmol/l (134-143)

Potassium 5.4 mmol/l (3.5-5)

Creatinine 138 µmol/l (60-120)

HbA1c 8.4%(<5.5)

According to the ADA/EASD consensus algorithm, which of the following is the most appropriate management for him?

- 1- Add acarbose
- 2- Add pioglitazone
- 3- Start a basal bolus insulin regime
- 4- Start basal insulin at night
- 5- Start BD mixed insulin

Answer & Comments

Answer: 2- Add pioglitazone

The preferred pathway of the consensus is to follow well validated therapies, progressing from metformin to metformin and sulphonylurea (SU) or insulin, and eventually to insulin.

However, hazardous occupations may allow the addition of therapies from the less well validated group, which includes pioglitazone.

If heavy goods vehicle drivers commence insulin therapy then they must relinquish their licence; this would mean this patient losing his livelihood.

Other professions where insulin-related hypoglycaemia may present a problem include:

Taxi driving

Operating machinery

Working changing shift patterns.

Given the history of problems controlling fasting blood sugar, acarbose may not be particularly useful as it mainly deals with post prandial blood glucose.



[Q: 2200] OnExamination 2012 - Endocrinology

A 38-year-old lady was diagnosed with gestational diabetes at 28 weeks of pregnancy.

She had a BMI of 38 kg/m² and denied any osmotic symptoms. Her fetal ultrasound at 24 weeks gestation reported normal fetal growth.

She has been complying with a healthy diet and her capillary blood glucose monitoring had revealed readings usually between 8 to 12 mmol/L (3.0-6.0). Her recent HbA1c measured 6.8% (3.8-6.4).

What is the next most appropriate management step?

- 1- Gliclazide therapy
- 2- Insulin therapy
- 3- Metformin therapy
- 4- Pioglitazone therapy
- 5- Repeat HbA1c in a fortnight

Answer & Comments

Answer: 3- Metformin therapy

2.5% of pregnancies in England and Wales involve women with diabetes. Approximately 87% of these are due to gestational diabetes, 7.5% type 1 diabetes and 5% type 2 diabetes. There are a number of risks to both mother and fetus, including miscarriage, pre-eclampsia, preterm labour, stillbirth, congenital malformations, macrosomia, birth injury, perinatal mortality and neonatal hypoglycaemia.

Risk factors for gestational diabetes are BMI >30 kg/m², previous macrosomic baby (>4.5kg), previous gestational diabetes, first-degree relative with diabetes, ethnic origin (South Asian, Caribbean, Middle Eastern). Screening with fasting plasma glucose, random blood glucose, glucose challenge tests and urinalysis is recommended for any

women with one of these risk factors. The 2-hour 75g oral glucose tolerance test is used to definitively diagnose gestational diabetes. This is performed at 16-18 weeks in women who have been affected in a previous pregnancy (with home BM monitoring prior to this, and a repeat test at 28 weeks if this is normal) and 24-28 weeks for women with any other risk factor.

If it is safely achievable, women with gestational diabetes should aim to keep fasting blood glucose between 3.5-5.9mmol/litre and one hour postprandial blood glucose below 7.8mmol/litre during pregnancy. It is important to note HbA1c should not be routinely used to monitor glycaemic control in the second and third trimesters.

Most gestational diabetes will respond to changes in diet and exercise. Only 10-20% of women need oral hypoglycaemia agents or insulin therapy. Women should therefore be given dietary advice, and those with a pre-pregnancy BMI of >27 should be advised to restrict calorie intake and exercise for at least 30 minutes daily.

Hypoglycaemic therapy should be considered for women in whom diet and exercise fails to maintain blood glucose targets during a period of 1-2 weeks. If there is any evidence of fetal macrosomia therapy should be initiated immediately. Treatment should be tailored to the individual women, but in general may include oral hypoglycaemics (metformin and glibenclamide) and insulin. There is insufficient evidence regarding long-acting insulin analogues, and isophane insulin therefore remains the first choice for long-acting insulin during pregnancy. Insulin aspart and lispro are safe rapid-acting analogues.

Women with insulin-treated gestational diabetes should be advised of the risk of hypoglycaemia (which they may be unaware of) and provided with a concentrated glucose solution.

During labour and birth, capillary blood glucose should be monitored on an hourly basis in patients with diabetes and maintained between 4 and 7mmol/litre. This may require the use of a sliding scale.

In this patient diet has failed to achieve adequate glycaemic control, and it is therefore reasonable to start metformin. None of the other oral hypoglycaemics listed are indicated in pregnancy. Waiting another two weeks to instigate therapy exposes both mother and foetus to potential harm. Insulin can be used if glycaemic control is not achieved with metformin.



[Q: 2201] OnExamination 2012 - Endocrinology

A 55-year-old man with type 2 diabetes has noticed elevation of his blood glucose levels on a new treatment for his lipids.

He says his diet and exercise levels are unchanged his HbA1c has also deteriorated by about 0.5%.

Which one of the following drugs is the likely cause?

- 1- Cholestyramine
- 2- Ezetimibe
- 3- Fenofibrate
- 4- Nicotinic acid
- 5- Rosuvastatin

Answer & Comments

Answer: 4- Nicotinic acid

The mechanism of the effect of nicotinic acid on glucose is not entirely clear but, in some patients, it may increase blood glucose. For the majority of patients with diabetes it has a minimal effect.

A number of postulated mechanisms have been suggested for this. Since nicotinic acid inhibits triglyceride synthesis, it may be that the increased availability of free fatty acids

stimulates hepatic glucose output by increasing gluconeogenesis or replacing glucose as the primary energy source. Higher levels of fatty acids may also block glucose uptake by skeletal muscle. Direct effects on beta-cell function have also been postulated.

A recent meta-analysis showed an increase in risk of inducing diabetes in patients treated with intensive statin therapy, compared to moderate doses. However, discussion in the literature has suggested there may have been a number of confounding factors leading to increased diabetic risk in these patients. Regardless of this, it did not look at whether statins worsened HbA1c in established diabetics, and therefore you cannot extrapolate its findings to this question.

Cholestyramine interacts with a number of medications (including oral hypoglycaemics), due to impact on drug absorption. However, in clinical practice it doesn't usually worsen diabetic control (and in fact some studies have shown improved glycaemic control).

Fenofibrate and ezetimibe have not been shown to worsen diabetic control.



[Q: 2202] OnExamination 2012 - Endocrinology

Which of the following statements regarding bariatric surgery is correct?

- 1- Associated with a significant post-operative mortality
- 2- Associated with nutritional deficiencies
- 3- Contraindicated in adolescents
- 4- Indicated in patients with a BMI <35 kg/m²
- 5- Has no effect on cardiovascular mortality

Answer & Comments

Answer: 2- Associated with nutritional deficiencies

Bariatric surgery is a major gastrointestinal procedure. Bariatric surgery in adolescents

raises social, psychological and developmental issues, but adolescents are not excluded from surgery, and some hospitals have specialised programmes for younger patients.

Potential candidates for surgery are those with a body mass index (BMI) exceeding 40, or BMI >35 with serious co-morbidities (for example, sleep apnoea, type 2 diabetes). Post-operative mortality ranges from 0.1-2%.

Vomiting is a risk associated with bariatric surgery, as is dumping syndrome and nutritional deficiencies. There is no evidence as yet, that bariatric surgery reduces cardiovascular mortality in patients.



[Q: 2203] OnExamination 2012 - Endocrinology

A 70-year-old man who has had type 2 diabetes for 20 years is referred to the clinic because of poor glycaemic control despite recent dietetic input.

He has a history of two previous myocardial infarctions, and gets exertional angina at 50 yards. He has previously had angioplasty to both his lower limbs and despite this has a claudication distance of 40 yards. He has New York Heart Association failure class II-III.

Additionally he has diabetic maculopathy, and distal sensory neuropathy.

His home blood monitoring readings are 10-15 mmol/l before breakfast.

His current treatment includes; metformin 500 mg tds, glimepiride 4 mg daily, insulin detemir 20 units at night, perindopril 8 mg OD, furosemide 80 mg daily, aspirin 75 mg daily and atorvastatin 20 mg daily.

On examination his BMI is 30, with a BP of 140/70 mmHg.

Investigations show:

HbA1c 9.2% (3.8-6.4)

Fasting glucose 13.4 mmol/l (3.0-6.0)

Creatinine 130 µmol/l (60-110)

Liver function Normal

Which of the following strategies is the most appropriate for his glycaemic control?

- 1- Add pioglitazone 30 mg daily
- 2- Add prandial insulin (for example, NovoRapid) three times daily
- 3- Add premixed insulin (for example, Humalog 25) twice daily and stop Lantus
- 4- Substitute metformin with Avandamet 4/500 mg twice daily
- 5- Up titrate the dose of insulin detemir

Answer & Comments

Answer: 5- Up titrate the dose of insulin detemir

This patient has uncontrolled glycaemia despite the current dose of insulin glargine, oral hypoglycaemic therapy and dietary intervention.

Pioglitazone is already contraindicated because of the history of heart failure.

The current basal insulin regime of the insulin analogue detemir is failing to control his glycaemia, however the current dose is inadequate. Current practice would favour increasing the dose of detemir, aiming for a fasting (pre-breakfast) BM of <7.0.

Only once fasting readings of this level are achieved, (with a sub-optimal HbA1c), would one think of adding a prandial insulin.

The caveat would be nocturnal hypoglycaemia, in which case a change in the insulin regime would be warranted, however this was not mentioned in the vignette.



[Q: 2204] OnExamination 2012 - Endocrinology

A 51-year-old district nurse presented with a history of near fainting episodes, which were promptly relieved by eating chocolates.

At her last hospital admission, her simultaneous blood results were as follows:

Plasma glucose 1.8 mmol/l (3.0-6.0)

Serum insulin 58 pmol/l (<21)

C-peptide Undetectable

What is the most likely diagnosis?

- 1- Alcohol induced hypoglycaemia
- 2- Exogenous insulin administration
- 3- Growth hormone deficiency
- 4- Insulinoma
- 5- Sulfonylurea induced hypoglycaemia

Answer & Comments

Answer: 2- Exogenous insulin administration

The vignette of a middle-aged woman who has spontaneous hypoglycaemia and inappropriately high insulin (should be undetectable in presence of hypoglycaemia) would suggest insulinoma.

Yet, the C peptide is undetectable (indicating she has been administering insulin as the C peptide is released with endogenous insulin), and her occupation suggests drug abuse, in this case insulin.



[Q: 2205] OnExamination 2012 - Endocrinology

A 32-year-old woman presented with a six week history of 7 kg weight loss and heat intolerance.

Investigations revealed:

Free T₄ 45 pmol/L (10-22)

TSH <0.05 mU/L (0.4-5)

Which of the following features would support a diagnosis of Graves' disease?

- 1- Family history of radio-iodine treatment
- 2- Lid lag
- 3- Multinodular goitre
- 4- Pretibial myxoedema

5- Unilateral exophthalmos

Answer & Comments

Answer: 4- Pretibial myxoedema

This is a difficult question.

The specific features that would support a diagnosis of Graves' would include

Exophthalmos

Thyroid bruit and

Pretibial myxoedema.

The latter is pathognomonic as exophthalmos may be a feature (rarely) of hashitoxicosis.



[Q: 2206] OnExamination 2012 - Endocrinology

A 47-year-old schoolteacher presents to her GP with fatigue.

The GP noted her to be hypercalcaemic with an albumin of 39 g/L (37-49), globulin of 28g/L and Ca++ of 2.80 mmol/l (2.2-2.6).

Which of the following statements is true?

- 1- 24 hour urinary calcium assay is of no use at all.
- 2- Modern assays for PTH and PTHrp may cross-react so assays are unreliable.
- 3- Primary hyperparathyroidism will be diagnosed only if the PTH is at least three times the normal range.
- 4- The most likely diagnosis is myeloma.
- 5- The patient could undergo parathyroidectomy if renal stones are found on ultrasound

Answer & Comments

Answer: 5- The patient could undergo parathyroidectomy if renal stones are found on ultrasound

Twenty four hour urinary calcium may be useful if used in comparison to the serum

calcium in order to distinguish familial hypocalciuric hypercalcaemia from primary hyperparathyroidism.

Parathyroid hormone (PTH) may be less than twice the upper limit of normal in primary hyperparathyroidism.

Several indications for surgery exist including:

Calcium more than 1 mg/dl above upper normal limit

Greater than 30% decline in renal function

Renal stones

Age less than 50

Unwillingness of patient to follow advice of medical surveillance.

Myeloma is unlikely given the normal immunoglobulins.



[Q: 2207] OnExamination 2012 - Endocrinology

A 35-year-old woman is noted by her GP to have ++ glycosuria. Her BMI is 35 kg/m² and a fasting plasma glucose is 7.4 mmol/l (3.0-6.0).

Which one of the following measures would be most effective in reducing her insulin resistance?

- 1- Glibenclamide
- 2- Insulin
- 3- Metformin
- 4- Weight loss
- 5- Repaglinide

Answer & Comments

Answer: 4- Weight loss

The most appropriate treatment of this obese female with type 2 diabetes, which would also substantially reduce insulin concentrations, is weight loss.

Glibenclamide may be associated with increased insulin resistance as it stimulates insulin secretion, as does repaglinide.

Metformin would improve insulin sensitivity but would not do it as much as weight loss.

The unfortunate thing is that weight loss is the most difficult strategy for the patient to adhere to.



[Q: 2208] OnExamination 2012 - Endocrinology

A 60-year-old male with diet controlled type 2 diabetes mellitus is commenced on metformin due to deteriorating glycaemic control.

Which of the following is true regarding metformin?

- 1- It does not require any functioning pancreatic islet cells for its action
- 2- It is contraindicated in patients suffering a myocardial infarction (MI)
- 3- It is safe in patients with renal impairment
- 4- It may cause metabolic alkalosis
- 5- It often causes hypoglycaemia

Answer & Comments

Answer: 2- It is contraindicated in patients suffering a myocardial infarction (MI)

Metformin is a biguanide which acts to improve insulin sensitivity through mechanisms that involve hepatic gluconeogenesis and improved muscle glucose utilisation.

Thus, some insulin must be produced for it to have an effect.

It is associated with hypoglycaemia although this side effect is unusual.

It is contraindicated in subjects with renal failure, hepatic failure and heart failure due to the association with lactic acidosis.

The BNF states that there should be a six week "cooling off" period post-MI before the commencement or recommencement of metformin.



[Q: 2209] OnExamination 2012 - Endocrinology

A 16-year-old female presents with hypertension and increasing weight.

Which of the following features would be most suggestive of Cushing's syndrome rather than simple obesity?

- 1- Abdominal striae
- 2- Acanthosis nigricans
- 3- Buffalo hump (interscapular fat pad)
- 4- Moon face
- 5- Proximal myopathy

Answer & Comments

Answer: 5- Proximal myopathy

Proximal myopathy, easy bruising and thin skin are clinical features that are most suggestive of Cushing's syndrome.

Otherwise, abdominal striae, buffalo hump, and acanthosis nigricans are all features of obesity.

Similarly oligomenorrhoea would be a feature of obesity/polycystic ovarian syndrome.



[Q: 2210] OnExamination 2012 - Endocrinology

A 40-year-old female who has been prescribed thyroid replacement therapy has routine thyroid function tests.

On examination she appeared clinically euthyroid with no abnormal findings.

Her thyroid function tests revealed:

TSH 3.2 mU/L (0.4-5.0)

Total T₄ 20 nmol/L (55-144)

Free T₄ 2.6 pmol/L (10-22)

Total T₃ 2.5 nmol/L (0.9-2.8)

Which one of the following statements is correct?

- 1- Her thyroid hormone replacement is adequate
- 2- Investigation of pituitary function is required
- 3- She has a thyroiditis
- 4- She has sick euthyroid syndrome
- 5- She has tertiary hypothyroidism

Answer & Comments

Answer: 1- Her thyroid hormone replacement is adequate

This question is extremely poorly presented as no one, except for the MRCP, measures total thyroid hormone concentrations.

However, this patient has normal TSH, low total T4 with normal total T3 and really low free T4 which would suggest that she is taking T3 as replacement therapy. This may explain why no fT3 figures are provided.

Consequently she is receiving adequate replacement as reflected by the normal thyroid-stimulating hormone (TSH).

She does not have sick euthyroidism as it states in the run in that these measurements were routine. Although TSH is normal and tT4 and fT4 low, secondary/tertiary hypothyroidism would not explain the plum normal total T3 concentration.

She may well have had a thyroiditis such as Hashimoto's to have given her the hypothyroidism originally but she is now on replacement therapy and the former would not explain her thyroid function tests.



[Q: 2211] OnExamination 2012 - Endocrinology

A 50-year-old woman presented with a recently discovered, solitary, thyroid nodule.

Which of the following would suggest a diagnosis of thyroid malignancy?

- 1- Elevated serum thyroglobulin concentration.
- 2- Features of thyrotoxicosis.
- 3- Ipsilateral Horner's syndrome
- 4- Previous I131 therapy.
- 5- Tenderness over the nodule.

Answer & Comments

Answer: 3- Ipsilateral Horner's syndrome

The association of Horner's syndrome and a thyroid nodule would suggest invasion of the sympathetic chain and would suggest that this thyroid nodule is malignant.

Previous I131 is not associated with the development of malignancy.

Thyroglobulin may be elevated in any thyroiditis.

Tenderness over the nodule would suggest a thyroiditis and thyrotoxicosis suggests a functional adenoma making the malignancy extremely unlikely.



[Q: 2212] OnExamination 2012 - Endocrinology

To which of the following drug classes does the oral hypoglycaemic agent, pioglitazone, belong?

- 1- A biguanide
- 2- A peroxisome proliferator activating receptor (PPAR)-alpha agonist
- 3- A peroxisome proliferator activating receptor (PPAR)-gamma agonist
- 4- A sulphonylurea
- 5- An alpha-glucosidase inhibitor

Answer & Comments

Answer: 3- A peroxisome proliferator activating receptor (PPAR)-gamma agonist

Pioglitazone belongs to the PPAR gamma agonist class of blood glucose lowering agents.

Through activation of this receptor they modulate adipocyte function and improve insulin sensitivity.

Blood glucose lowering effect is around 1-1.3% HbA1c, but associated adverse events include fluid retention and decreased bone mineral density.

Pioglitazone is contraindicated in patients with a prior history of heart failure.



[Q: 2213] OnExamination 2012 - Endocrinology

A 48-year-old male is referred with impotence. He has a history of angina, hypertension and type 2 diabetes.

Which one of the following drugs that he takes would present a contraindication to his being able to receive sildenafil?

- 1- Aspirin
- 2- Bendroflumethiazide
- 3- Isosorbide mononitrate
- 4- Lisinopril
- 5- Metformin

Answer & Comments

Answer: 3- Isosorbide mononitrate

Nitrates and sildenafil are contraindicated due to the precipitant drops in blood pressure.

Viagra is also associated with increases in intraocular pressure so should be avoided in

Glaucoma

Hereditary retinal disease

Those with hypotension.



[Q: 2214] OnExamination 2012 - Endocrinology

When considering diabetic retinopathy which of the following statements is most accurate?

- 1- Microaneurysms (MA) represent sacular dilatation of retinal arterioles
- 2- Hard exudates (HE) represent calcium deposits in the retina
- 3- Cotton wool spots (CWS) represent infarcts of the nerve fibre layer of the retina
- 4- Haemorrhages close to the fovea are not potentially sight threatening
- 5- Laser photocoagulation is applied directly to new vessels to destroy them

Answer & Comments

Answer: 3- Cotton wool spots (CWS) represent infarcts of the nerve fibre layer of the retina

- A. MAs are capillary aneurysms.
- B. HEs are collections of exudated lipid and protein.
- C. This is correct, multiple CWS are a pre-proliferative sign.
- D. Haemorrhages (or HEs) close to the fovea represent a risk of macular oedema and are therefore sight threatening.
- E. Laser destroys ischaemic but viable retina to reduce the secretion of angiogenic growth factors and allow new vessel regression. it is not applied directly to new vessels as this would cause bleeding.



[Q: 2215] OnExamination 2012 - Endocrinology

A 45-year-old woman with a longstanding history of lithium use for bipolar disorder presents to the clinic for review.

She has a history of polyuria and polydipsia. On examination her BP is 135/72 mmHg, pulse is 71 and regular.

Investigations show:

Haemoglobin 11.8 g/dl(11.5-16.0)

White cell count $6.9 \times 10^9/L$ (4-11)

Platelets $199 \times 10^9/L$ (150-400)

Sodium 149 mmol/l (135-146)

Potassium 4.2 mmol/l (3.5-5)

Creatinine 122 $\mu\text{mol/l}$ (79-118)

Glucose 5.4 mmol/l (<7.0)

Urinary osmolality 280 mOsm/kg(>300) after fluid restriction

Which of the following is the most likely diagnosis?

- 1- Cranial diabetes insipidus
- 2- Diuretic abuse
- 3- Nephrogenic diabetes insipidus
- 4- Psychogenic polydypsia
- 5- SIADH

Answer & Comments

Answer: 3- Nephrogenic diabetes insipidus

Whilst cranial diabetes insipidus (DI) is not impossible, it is less likely than nephrogenic DI in a patient taking chronic lithium therapy.

Diuretic abuse and psychogenic polydypsia are ruled out by the fluid deprivation test.

Syndrome of inappropriate secretion of antidiuretic hormone (SIADH) results in water retention and hyponatraemia.



[Q: 2216] OnExamination 2012 - Endocrinology

You are reviewing a 23-year-old man who has history of Klinefelter's syndrome.

He is concerned about long term health risks associated with low testosterone levels.

Which of the following are likely consequences of his Klinefelter's?

- 1- Increased bone mineral density

2- Increased libido

3- Increased percentage of free testosterone

4- Low HDL cholesterol

5- Low LDL cholesterol

Answer & Comments

Answer: 4- Low HDL cholesterol

Klinefelter's is associated with a decrease in libido and men with the condition often find it very difficult to form lasting relationships.

Bone mineral density is decreased, and they are at increased risk of osteoporotic fractures.

Low-density lipoprotein (LDL) levels may be normal or increased, and triglyceride levels are often elevated.

Overall testosterone levels are low; Klinefelter's itself does not impact on the fraction which is protein bound however.



[Q: 2217] OnExamination 2012 - Endocrinology

A 19-year-old man from a travelling family comes to the endocrine clinic for review. He has bony aches and pains and feels tired all the time.

On examination his BP is 110/72 mmHg, pulse is 70 and regular. His BMI is 21, and he is only 160 cm in height. According to his mother this is much shorter than his brothers. He has bilateral shortened fifth digits on both hands.

Investigations show:

Haemoglobin 12.9 g/dl(13.5-17.7)

White cell count $8.3 \times 10^9/L$ (4-11)

Platelets $190 \times 10^9/L$ (150-400)

Sodium 140 mmol/l (135-146)

Potassium 4.2 mmol/l (3.5-5)

Creatinine 95 $\mu\text{mol/l}$ (79-118)

Calcium 2.00 mmol/l (2.2-2.61)

Phosphate 1.6 mmol/l (0.8-1.5)

Which of the following is the most appropriate treatment?

- 1- Calcitonin
- 2- Calcium and vitamin D
- 3- Cinacalcet
- 4- Magnesium sulphate
- 5- Sevelamer

Answer & Comments

Answer: 2- Calcium and vitamin D

This patient has pseudohypoparathyroidism. This is caused by a maternally inherited G-protein abnormality. There is a characteristic phenotype with short stature, dysmorphic features (including short 4th or 5th metacarpals) and intellectual impairment. In addition there is resistance to a variety of hormones that act via cAMP (including PTH, TSH and gonadotrophins). Spontaneous or paternally inherited mutations cause dysmorphic features alone. Biochemically there is hypocalcaemia with raised PTH concentrations, raised TSH with low T4 and raised gonadotrophins. Hypocalcaemia causes paraesthesia, cramps, tetany, and carpopedal spasm, whereas hypothyroidism causes fatigue. The mainstay of treatment is calcium and vitamin D.

Sevelamer is a phosphate binder, so only really has a role in renal impairment.

Cinacalcet is used in the treatment of tertiary hyperparathyroidism.

Calcitonin is a second or third line therapy used in the treatment of osteoporosis.

There is no evidence that the patient is magnesium deficient, so magnesium sulphate is also an inappropriate answer.



[Q: 2218] OnExamination 2012 - Endocrinology

Bromocriptine is recognised as a dopamine

agonist and is used in the treatment of a range of disorders including prolactin secreting pituitary adenoma and Parkinson's.

Which of the following is associated with bromocriptine therapy?

- 1- Diarrhoea is commonly seen
- 2- Excessive sleepiness is commonly seen
- 3- Nasal congestion is rarely seen
- 4- Pulmonary fibrosis is not a recognised association
- 5- Tinnitus is rarely seen

Answer & Comments

Answer: 5- Tinnitus is rarely seen

Excessive sleepiness is seen only rarely in conjunction with bromocriptine therapy, it is seen more commonly with modern agents such as ropinirole.

With respect to gastrointestinal adverse events, it is constipation that is commonly seen, with diarrhoea only rarely associated with bromocriptine therapy.

Pulmonary fibrosis is rarely associated with bromocriptine therapy, although nasal congestion is actually a common feature of treatment.



[Q: 2219] OnExamination 2012 - Endocrinology

A 19-year-old man comes to the clinic with short stature and bony aches and pains. He attends a day care centre as he was identified as requiring special needs support at a young age.

On examination his BP is 135/72 mmHg, his pulse is 69 and regular. He is short at 160 cm in height and you notice a shortened fifth digit on both hands.

Investigations show:

Haemoglobin 13.0 g/dl(13.5-17.7)

White cell count $6.9 \times 10^9/L$ (4-11)

Platelets $207 \times 10^9/L$ (150-400)

Sodium 137 mmol/l (135-146)

Potassium 3.8 mmol/l (3.5-5)

Creatinine 114 $\mu\text{mol/l}$ (79-118)

Alkaline phosphatase 165 U/l (39-117)

Calcium 2.05 mmol/l (2.20-2.62)

Which of the following hormonal conditions is most likely to be present in addition to his abnormality of calcium metabolism?

- 1- Addison's disease
- 2- Hypergonadism
- 3- Hyperthyroidism
- 4- Hypogonadism
- 5- Hypothyroidism

Answer & Comments

Answer: 5- Hypothyroidism

Hyperthyroidism is incorrect because the G protein receptor mutation associated with pseudohypoparathyroidism is a non-functioning one.

Mutations in the gonadotrophin receptor are less common than those seen causing hypothyroidism; mutations leading to low levels of cortisol are rarer still but are reported in some patients.



[Q: 2220] OnExamination 2012 - Endocrinology

A 30-year-old woman is known to have a pituitary microadenoma for which she takes long term dopamine agonist therapy.

At her last clinic follow up she is well, has no symptoms of milk leakage, and her libido and sex life have returned to normal. She wishes to start a family with her partner.

Which of the following is the correct advice for her?

- 1- She should continue her bromocriptine throughout the pregnancy

- 2- She should not start a family until post surgical removal
- 3- She should stop her bromocriptine once she knows she is pregnant
- 4- She should stop her bromocriptine prior to trying to get pregnant
- 5- She should switch the bromocriptine to cabergoline prior to getting pregnant

Answer & Comments

Answer: 3- She should stop her bromocriptine once she knows she is pregnant

Many women with a microprolactinoma can be maintained on dopamine agonists without the need to progress to surgery which itself carries associated morbidity.

As such there is no need to stop therapy or progress to surgery before trying for a child, indeed stopping therapy will reduce the chance of ovulation.

There is no evidence that bromocriptine is required to be continued throughout the pregnancy.



[Q: 2221] OnExamination 2012 - Endocrinology

A 39-year-old man presents to his GP for review.

He has a history of carpal tunnel syndrome and osteoarthritis of his weight bearing joints, and has recently begun to suffer from symptoms of sleep apnoea.

On examination he has a prominent jaw line and macroglossia. His BP is elevated at 155/95 mmHg. There is peripheral visual field loss.

Investigations show:

Haemoglobin 13.9 g/dl (13.5-17.7)

White cell count $8.2 \times 10^9/L$ (4-11)

Platelets $202 \times 10^9/L$ (150-400)

Sodium 136 mmol/l (135-146)

Potassium 4.4 mmol/l (3.5-5)

Creatinine 90 µmol/l (79-118)

Fasting glucose 8.8 mmol/l (<7.0)

Which of the following is true?

- 1- Growth hormone antagonists do not improve surgical survival
- 2- Pegvisomant can be used where IGF-1 is not normalised post surgery
- 3- Prolactin is most likely to be normal
- 4- Random growth hormone is always elevated
- 5- Risk of colonic carcinoma is not increased in this patient

Answer & Comments

Answer: 2- Pegvisomant can be used where IGF-1 is not normalised post surgery

Growth hormone antagonists used prior to surgery improve metabolic risk factors for surgery, such as hypertension and hyperglycaemia, as such even use over a few weeks before adenomectomy may impact positively on morbidity / mortality associated with surgery.

Prolactin may be elevated due to mass effect, and risk of colonic carcinoma is elevated in patients with acromegaly.

Growth hormone secretion is pulsatile, as such it may not always be elevated, and therefore IGF-1 is a better screening test for acromegaly.



[Q: 2222] OnExamination 2012 - Endocrinology

A 42-year-old man comes to the clinic with thirst, weight loss and polyuria. He tells you that his mother and aunt both have diabetes.

He himself is overweight with a BMI of 27, but tells you that he is pleased to have lost 7 kg in weight over the past few months, although he does admit to feeling weaker recently.

Investigations show:

Haemoglobin 13.8 g/dl(13.5-18)

White cell count $5.1 \times 10^9/l$ (4-10)

Platelets $199 \times 10^9/l$ (150-400)

Sodium 141 mmol/l (134-143)

Potassium 5.0 mmol/l (3.5-5)

Creatinine 131 µmol/l (60-120)

Fasting glucose 14.1 mmol/l (<7.0)

According to the ADA/EASD consensus algorithm 2006 which of the following is the most appropriate initial therapy for him?

- 1- Acarbose
- 2- Gliclazide
- 3- Metformin and Insulin
- 4- Metformin
- 5- Pioglitazone

Answer & Comments

Answer: 3- Metformin and Insulin

This man has significant hyperglycaemia and symptoms of catabolism, weight loss, thirst, polyuria, etc.

In this case consensus guidelines recommend moving straight to insulin therapy, both for rapid control of glucose levels with symptom resolution, and because type 1 diabetes cannot be excluded in this case.

Depending on circumstances, oral medications can be added later and insulin even withdrawn in some cases.



[Q: 2223] OnExamination 2012 - Endocrinology

A 50-year-old man presented with a milky discharge from his nipples. He had a history of depression and gastro-oesophageal reflux disease and was on a number of medications.

Plasma prolactin 650 mU/L (< 360)

Which of the following is the most likely cause of his symptoms?

- 1- Amitryptiline
- 2- Cimetidine
- 3- Fluoxetine
- 4- Metoclopramide
- 5- Omeprazole

Answer & Comments

Answer: 4- Metoclopramide

This man has galactorrhoea and raised prolactin.

The most likely culprit is metoclopramide through its action on dopamine. It releases prolactin through dopamine antagonism.



[Q: 2224] OnExamination 2012 - Endocrinology

A 51-year-old man with type 2 diabetes was admitted to the coronary care unit with an acute myocardial infarction (MI) and left ventricular failure. He was commenced on intravenous sliding scale insulin at admission.

His other medications comprised gliclazide 80 mg twice daily, aspirin 75 mg OD, ramipril 5 mg daily, isosorbide mononitrate 20 mg BD, furosemide 40 mg OD and simvastatin 40 mg OD. On stopping his sliding scale insulin, his blood glucose meter readings vary between 15 to 20 mmol/l.

He was very obese with a BMI of 38.

Investigations showed:

Serum Sodium 134 mmol/l (137-144)

Serum Potassium 4.7 mmol/l (3.5-4.9)

Serum Urea 8.9 mmol/l (2.5-7.5)

Serum Creatinine 186 µmol/l (60-110)

Haemoglobin HbA1c 9.4 % (3.8-6.4)

What is the next most appropriate measure to optimise his glycaemic control?

- 1- Increase gliclazide dose
- 2- Insulin
- 3- Metformin
- 4- Orlistat
- 5- Pioglitazone

Answer & Comments

Answer: 2- Insulin

This man is obese, has poor glycaemic control and cannot use metformin due to the creatinine above 150, and the recent MI.

Insulin is the most appropriate therapeutic option.

Given the recent MI and use of furosemide, this is enough evidence of cardiac failure to count against use of pioglitazone.



[Q: 2225] OnExamination 2012 - Endocrinology

You are asked to review a 76-year-old man who has been admitted with pneumonia as the nurses notice he is significantly confused.

On examination his BP is 142/72 mmHg, his pulse is 78 and regular. He has signs of right sided pneumonia.

Investigations show:

Haemoglobin 12.9 g/dl (13.5-17.7)

White cell count $12.4 \times 10^9/L$ (4-11)

Platelets $192 \times 10^9/L$ (150-400)

Sodium 127 mmol/l (135-146)

Potassium 4.0 mmol/l (3.5-5)

Creatinine 90 µmol/l (79-118)

Which of the following is likely to be found in this patient?

- 1- Free water excretion is likely to be elevated
- 2- Free water excretion is likely to be normal
- 3- Free water excretion is likely to be reduced
- 4- Sodium excretion is likely to be increased

5- Sodium excretion is likely to be normal

Answer & Comments

Answer: 3- Free water excretion is likely to be reduced

Free water excretion is not elevated or normal in conditions of antidiuretic hormone (ADH) excess, therefore options A and B are incorrect.

There is no effect on sodium excretion in syndrome of inappropriate antidiuretic hormone (SIADH) and therefore options D and E are also incorrect.

However, although 24 hour excretion rates of sodium are generally unchanged, as the urine volume is low with retention of free water, urine concentrations of sodium will appear inappropriately high.



[Q: 2226] OnExamination 2012 - Endocrinology

A 22-year-old woman presented with a five year history of hirsutism, having noticed coarse dark hair under her chin. Being a teacher in a primary school, these symptoms are very distressing for her. She has tried local measures such as shaving and applying depilatory creams but without lasting success.

Her periods are irregular with oligomenorrhoea. She attained menarche at the age of 14 years. She has not yet conceived and has had a coil fitted for contraception. She takes 5 mg diazepam at night.

On examination, she had a BMI of 24. She had coarse, dark hair over her chin, lower back and inner thighs. She does not have galactorrhoea to expression and there were no other clinical features to suggest Cushing's.

Investigations during the follicular phase:

Serum androstenedione 10.1 nmol/l (0.6-8.8)

Serum dehydroepiandrosterone sulphate 11.6 μ mol/l (2-10)

Serum 17-hydroxyprogesterone 18.6 nmol/l (1-10)

Serum oestradiol 380 pmol/l (200-400)

Serum testosterone 2.6 nmol/l (0.5-3)

Plasma luteinising hormone 3.3 U/l (2.5-10)

Plasma follicle-stimulating hormone 3.6 U/l (2.5-10)

What is the next most appropriate investigation?

1- 24 hour urinary free cortisol

2- CT scan of adrenals

3- GnRH test

4- Short Synacthen test with measurement of 17 hydroxy progesterone(17OHP)

5- Ultrasound scan of ovaries

Answer & Comments

Answer: 4- Short Synacthen test with measurement of 17 hydroxy progesterone(17OHP)

In this case the patient has features that would suggest polycystic ovary syndrome (PCOS) yet the 17OHP concentration is elevated and is compatible with non-classical congenital adrenal hyperplasia (CAH) yet just below the threshold of 33 nmol/l confidently to make the diagnosis.

Thus a short Synacthen test would be the most appropriate investigation with measurement of 17OHP.

A rise in 17OHP above 33 nmol/l suggests non-classical CAH.



[Q: 2227] OnExamination 2012 - Endocrinology

A 32-year-old female is being investigated for tinnitus by the ENT department and undergoes an MRI scan.

The scan is normal except for a pituitary tumour of 0.9 cm confined to the pituitary

fossa. Thyroid function tests, prolactin, LH, FSH and estradiol concentrations are all normal.

Which of the following would be the most appropriate management approach for this patient?

- 1- Pituitary biopsy
- 2- Reassure and continued observation
- 3- Stereotactic pituitary irradiation
- 4- Transphenoidal hypophysectomy
- 5- Treat with dopamine agonist therapy

Answer & Comments

Answer: 2- Reassure and continued observation

This patient has a coincidentally noted pituitary tumour, has no endocrine symptoms and appears to have normal endocrine function although we are not provided with information pertaining to cortisol secretory function nor growth hormone.

With this caveat in mind, the most appropriate strategy would be observation and repeat scanning.



[Q: 2228] OnExamination 2012 - Endocrinology

A 52-year-old schoolteacher attends with weight loss and sweats. She is clinically thyrotoxic with a diffuse goitre.

Subsequent investigations show:

Free T₄ 40 pmol/l (9-23)

Free T₃ 9.8 nmol/l (3.5-6)

TSH 6.1 mU/l (0.5-5)

A repeat TFT is similar.

What is the most appropriate investigation for this patient?

- 1- FNA of thyroid gland
- 2- MRI scan pituitary gland

- 3- Radio-isotope uptake scan of thyroid gland
- 4- Repeat TFT checking for antibody interference
- 5- Thyroid auto antibodies

Answer & Comments

Answer: 2- MRI scan pituitary gland

This patient is thyrotoxic; however, as the non-suppressed thyroid-stimulating hormone (TSH) suggests that this is due to excessive TSH production by the pituitary gland, the possibility of a thyrotroph adenoma must be pursued.

In primary hyperthyroidism the TSH should always be suppressed by negative feedback, which is not the case here.

TSH-omas are indeed very rare, but the giveaway would be the normal or elevated TSH with thyrotoxicosis.



[Q: 2229] OnExamination 2012 - Endocrinology

An elderly asthmatic lady on treatment with high dose prednisolone complains of a four week history of right hip pain.

She comments that recently she seems to be developing more facial hair and adds that she has also been diagnosed with high blood pressure and diabetes.

On examination she is noted to be unable to weight bear on the right side.

What is the most likely cause of her hip pain?

- 1- Avascular necrosis of femoral head
- 2- Dislocation of the hip joint
- 3- Fracture neck of femur
- 4- Gout
- 5- Osteoarthritis of the hip joint

Answer & Comments

Answer: 1- Avascular necrosis of femoral head

This question simply tests the knowledge of side effects of corticosteroids (a favourite theme in MRCP 1).

The patient has features of hypercortisolism.

Obviously avascular necrosis of femoral head is the cause of her right hip pain.



[Q: 2230] OnExamination 2012 - Endocrinology

In a study healthy volunteers are given 50 mls of 50% dextrose solution by one of two routes. Route A is intravenous and route B is via a nasogastric tube.

Every 15 minutes the plasma insulin level and glucose are measured and plotted on a graph.

Which of the following statements would best describe the likely results comparing route A to route B in this experiment?

- 1- Insulin and glucose the same in route A and route B
- 2- Insulin higher, glucose higher in route A
- 3- Insulin higher, glucose higher in route B
- 4- Insulin higher, glucose lower in route A
- 5- Insulin higher, glucose lower in route B

Answer & Comments

Answer: 5- Insulin higher, glucose lower in route B

Glucose given via the gut elicits a greater insulin response as compared to the same quantity given intravenously even though the plasma glucose peak is higher when it is given IV. This phenomenon is called the 'incretin effect'.

The incretin effect denominates the phenomenon that oral glucose elicits a higher insulin response than does intravenous glucose.

The two hormones responsible for the incretin effect, glucose-dependent insulinotropic hormone (GIP) and glucagon-like peptide-1

(GLP-1), are secreted after oral glucose loads and augment insulin secretion in response to hyperglycaemia.

Gastric Inhibitory Polypeptide and Glucagon-Like Peptide-1 in the Pathogenesis of Type 2 Diabetes. Diabetes 53:S190-S196, 2004

The investigation of the incretin effect is not usually performed using the same quantity of glucose as in this question. An 'isoglycaemic study' is often used where an infusion of glucose is designed to copy exactly the blood glucose profile generated in an individual or animal by a certain enteral glucose load.

Exenatide (synthetic exendin-4) is a new agent for the treatment of type 2 diabetes. Exendin-4 occurs naturally in the saliva venom of the North American lizard called the Gila Monster. It mimics the action of the gut hormone GLP-1 (Glucagon-like peptide 1).



[Q: 2231] OnExamination 2012 - Endocrinology

A 32-year-old woman with known hypothyroidism is admitted to hospital.

Her blood pressure is 86/53 mmHg and her pulse 100 bpm.

Investigations reveal:

Serum Sodium 126 mmol/L(137-144)

Serum Potassium 5.8 mmol/L(3.5-4.9)

Serum Glucose 3.0 mmol/L(3.0-6.0)

What is the most appropriate investigation?

- 1- Anti-thyroglobulin antibody
- 2- Plasma insulin concentration
- 3- Random serum cortisol concentration
- 4- Short Synacthen test
- 5- Urine and plasma osmolality

Answer & Comments

Answer: 4- Short Synacthen test

This young woman probably has an autoimmune hypothyroidism and now presents with features typical of acute hypoadrenalism.

The biochemistry is also supportive with low sodium, low glucose and elevated potassium.

The diagnosis may be confirmed with inadequate cortisol response in the short Synacthen test.

A random cortisol concentration is not adequate to diagnose hypoadrenalism.



[Q: 2232] OnExamination 2012 - Endocrinology

A 45-year-old woman presents with excessive hair growth on her face, chest and lower abdomen.

Which of the following may be associated with her condition?

- 1- Cyproterone
- 2- Hypoadrenalism
- 3- Minoxidil
- 4- Moxonidine
- 5- Valproate

Answer & Comments

Answer: 3- Minoxidil

Drugs causing hirsutism/hypertrichosis include minoxidil (not moxonidine -a centrally acting anti-hypertensive), phenytoin (not valproate) and cyclosporin.

Polycystic ovaries and congenital adrenal hyperplasia are associated with increased androgens and hirsutism.

Hypoadrenalism may be associated with loss of hair especially pubic hair.

Treatment of hirsutism is with anti-androgens (cyproterone, spironolactone), reduction of free androgens (oestrogen therapy, OCP,

weight loss), and cosmetic treatment for removal of hair.



[Q: 2233] OnExamination 2012 - Endocrinology

A 35-year-old woman presented with a five year history of weight gain associated with a one year history of amenorrhoea.

Over this time she had also noticed hirsutism and had been trying to conceive.

On examination, she had a BMI of 32 kg/m², a pulse was 84 beats per minute, and a blood pressure of 154/100 mmHg. Features suggestive of Cushing's syndrome were also noted.

Which of the following would be the most useful initial investigation?

- 1- 24 hour urinary free cortisol (UFC) concentration
- 2- Combined 9 am ACTH concentration and serum cortisol concentration
- 3- Midnight cortisol concentration
- 4- Serum sodium and potassium concentrations
- 5- The 1 mg overnight dexamethasone suppression test (ODST)

Answer & Comments

Answer: 1- 24 hour urinary free cortisol (UFC) concentration

Of 1 mg ODST or UFC, either test would be appropriate, but UFC is often recommended and has a 95% specificity (85% specificity in the obese) and a 98% sensitivity.

The ODST has a sensitivity and specificity of 98% and 75-80% in obese subjects with a cut-off value of 50 nmol/l.

Therefore, purely for convenience sake, a UFC would probably be the expected response here.

Midnight cortisol is pointless as a screening test expecting the patient to be fast asleep when blood is taken.

Sodium and potassium concentrations offer nothing, nor do ACTH and cortisol.



[Q: 2234] OnExamination 2012 - Endocrinology

Which of the following statements is true of primary hyperparathyroidism (HPT)?

- 1- It is associated with bone resorption by PTH to restore depressed serum calcium levels to normal.
- 2- It is associated with hypocalciuria due to elevated parathyroid hormone (PTH) levels.
- 3- It is usually caused by an adenoma of a single parathyroid gland.
- 4- It progresses to tertiary hyperparathyroidism with time.
- 5- PTH is secreted in a pulsatile manner from the posterior pituitary and acts through PTH receptors on parathyroid cell membranes

Answer & Comments

Answer: 3- It is usually caused by an adenoma of a single parathyroid gland.

Primary hyperparathyroidism has three main causes: adenoma, hyperplasia, and carcinoma. Adenomas clearly are the most prevalent entity representing 80-85% of cases. Hyperplasia is the second most common diagnosis constituting 15% of cases. Carcinoma represents <1% of total cases. All three cause inappropriate PTH release, which leads to hypercalcaemia and (usually) hypercalciuria.

Secondary hyperparathyroidism is described by option A: hypocalcaemia stimulates the parathyroid to produce excess PTH. It may progress to tertiary hyperparathyroidism,

whereby the parathyroid becomes autonomous in producing PTH even without the stimulus of hypocalcaemia, but primary does not.

PTH is produced by the parathyroid gland, not the posterior pituitary.



[Q: 2235] OnExamination 2012 - Endocrinology

An 18-year-old girl receives radioactive iodine (RAI) as treatment of thyrotoxicosis.

Which of the following is the most likely long term complication of this treatment?

- 1- Hypoparathyroidism
- 2- Hypothyroidism
- 3- Increased risk of developing cancer
- 4- Osteoporosis
- 5- Recurrent laryngeal nerve damage

Answer & Comments

Answer: 2- Hypothyroidism

RAI is safe and that is why it is given across all ages as a definitive treatment of thyrotoxicosis.

The most likely side effect of radioactive iodine is hypothyroidism with approximately 80% developing hypothyroidism after therapy.

There is no evidence to suggest that RAI is associated with any cancers.

However, RAI must not be given to pregnant females particularly after the 12th gestational week as it would be taken up by the developing fetal thyroid causing fetal hypothyroidism and is also considered to be teratogenic.

Recurrent laryngeal nerve damage is a potential risk of thyroid surgery, not RAI.



[Q: 2236] OnExamination 2012 -
Endocrinology

Which of the following is correct concerning nitric oxide?

- 1- Acts via cAMP as the second messenger
- 2- Inhibits platelet aggregation
- 3- Is inactivated by superoxide dismutase
- 4- Is manufactured from glycine
- 5- Is synthesised principally by the vascular smooth muscle

Answer & Comments

Answer: 2- Inhibits platelet aggregation

Nitric oxide is a free radical that is produced from L-arginine by nitric oxide synthase in the vascular endothelium.

It is anti-atherogenic, causing vasorelaxation, inhibiting platelet aggregation and foam cell formation.



[Q: 2237] OnExamination 2012 -
Endocrinology

A 62-year-old woman presents to the clinic with incontinence. She tells you that the pattern is always the same; with a warning she needs the toilet coming only a few moments before urine starts to leak, and she cannot get to the bathroom in time.

There is no medical history of note apart from mild hypertension which is managed with amlodipine 5 mg daily.

On examination her BP is 145/85 mmHg, pulse is 80 and regular. Respiratory and abdominal examination is unremarkable.

Investigations show:

Haemoglobin 11.8 g/dl (11.5-16.0)

White cell count $8.1 \times 10^9/L$ (4-11)

Platelets $198 \times 10^9/L$ (150-400)

Sodium 141 mmol/l (135-146)

Potassium 4.0 mmol/l (3.5-5)

Creatinine 122 $\mu\text{mol/l}$ (79-118)

Bladder scan No significant residual after voiding

Which of the following is the most appropriate initial treatment?

- 1- Bladder training
- 2- Doxazosin
- 3- Oxybutynin
- 4- Tamsulosin
- 5- Tolterodine

Answer & Comments

Answer: 1- Bladder training

Doxazosin is an alpha blocker used in the treatment of prostatic hypertrophy and hypertension.

Oxybutynin is first line drug therapy for urge incontinence with tolterodine amongst appropriate second line options.

Tamsulosin is an alpha-1 selective blocker used as an alternative to traditional alpha blockers for prostatic disease.



[Q: 2238] OnExamination 2012 -
Endocrinology

A 62-year-old man presents with rapidly deteriorating health, he has hardly eaten for days and has worsening nausea, vomiting and dehydration. He smokes 20 cigarettes per day and has been deteriorating with weight loss and a cough for some time.

On examination his BP is 110/70 mmHg, pulse is 95 and regular. He looks emaciated.

Investigations show:

Haemoglobin 10.0 g/dl (13.5-17.7)

White cell count $12.3 \times 10^9/L$ (4-11)

Platelets $188 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (135-146)

Potassium 4.3 mmol/l (3.5-5)

Creatinine 187 $\mu\text{mol/l}$ (79-118)

Calcium 3.3 mmol/l (2.2-2.61)

CXR Mass suspicious of a carcinoma

Which of the following is the most likely cause of his hypercalcaemia?

- 1- Bony metastases
- 2- Dehydration
- 3- Excess vitamin D
- 4- Hyperparathyroidism
- 5- PTHrP

Answer & Comments

Answer: 5- PTHrP

Given the presence of a lung mass, it is more likely that the hypercalcaemia is related to PTHrP rather than extensive metastases.

Whilst dehydration will contribute to the degree of hypercalcaemia, it is highly unlikely to be the primary cause here.

Excess vitamin D occurs as a result of sarcoidosis, and with the presence of smoking and a lung mass it is more likely that a carcinoma rather than hyperparathyroidism is the cause.



[Q: 2239] OnExamination 2012 - Endocrinology

A 22-year-old woman comes to see you with her partner. She is keen to start a family but there is a history of nephrogenic diabetes insipidus (DI) affecting her male relatives.

Which of the following is the most likely underlying defect?

- 1- Aquaporin-1 gene mutation
- 2- Aquaporin-2 gene mutation
- 3- Aquaporin-3 gene mutation
- 4- V1 ADH receptor gene mutation
- 5- V2 ADH receptor gene mutation

Answer & Comments

Answer: 5- V2 ADH receptor gene mutation

Autosomal recessive nephrogenic DI is related to mutations in the aquaporin-2 gene, leading to reduced water reabsorption in the distal tubule. Rarer forms of X linked recessive disease have also been described.

On the other hand, the V2 ADH mutation is usually X linked recessive, and is therefore the correct answer here.

Mutations of aquaporin-1, aquaporin-3, and vasopressin-1 receptors are not described in conjunction with nephrogenic DI.



[Q: 2240] OnExamination 2012 - Endocrinology

A 31-year-old man who works as a fitness instructor is referred to the clinic with resistant hypertension.

He is currently taking a combination of amlodipine, ramipril and indapamide. His BP is elevated at 155/95 mmHg. Other physical examination is unremarkable.

Investigations show:

Haemoglobin 12.5 g/dl (13.5-17.7)

White cell count $5.0 \times 10^9/\text{L}$ (4-11)

Platelets $204 \times 10^9/\text{L}$ (150-400)

Sodium 135 mmol/l (135-146)

Potassium 3.2 mmol/l (3.5-5)

Creatinine 119 $\mu\text{mol/l}$ (79-118)

Which of the following is the next appropriate investigation?

- 1- Abdominal CT
- 2- Aldosterone / renin ratio
- 3- DMSA
- 4- Renal angiogram
- 5- Urinary electrolytes

Answer & Comments

Answer: 2- Aldosterone / renin ratio

If renovascular disease is suspected, then angiography is a reasonable approach to investigation, but this may follow aldosterone / renin estimation.

CT scanning is appropriate if an adrenal adenoma is suspected.

DMSA has largely fallen out of favour and been replaced by either MRA or traditional angiography.

Urinary electrolytes are of less value as an investigation as they may be confounded by factors such as use of diuretics.



[Q: 2241] OnExamination 2012 - Endocrinology

A 28-year-old woman presents to the clinic because she has had no periods for the past four months, she also suffers from problems with vaginal dryness during intercourse and milk leakage when her boyfriend stimulates her breasts.

On examination her BP is 122/70 mmHg, her pulse is 67, and her BMI is 23. You can express milk on minimal nipple palpation.

You suspect hyperprolactinaemia.

Which of the following prolactin levels fits best with drug related hyperprolactinaemia?

- 1- 800
- 2- 1500
- 3- 3000
- 4- 5000
- 5- 10000

Answer & Comments

Answer: 1- 800

Hyperprolactinaemia is commonly related to medication use.

Levels less than 1000 are most likely to be drug related, the 1500 option is an intermediate level between that seen with drug related hyperprolactinaemia and a microprolactinoma.

The drug class most commonly associated with hyperprolactinaemia are the dopamine antagonists, although a range of others may be implicated, these include :

Antidepressants

Verapamil

Methyldopa

Opiates

Protease inhibitors

Omeprazole

H2 antagonists.

A. 800 is the correct answer because it most closely reflects a prolactin within the range of that usually associated with drug induced hyperprolactinaemia.

B. 1500 is incorrect because it may be due to drug induced hyperprolactinaemia or related to a microadenoma.

C. 3000 is incorrect because it is more consistent with a microprolactinoma.

D. 5000 is incorrect because it is more consistent with either a micro- or macro-prolactinoma.

E. 10000 is incorrect because it is more consistent with a macroprolactinoma.



[Q: 2242] OnExamination 2012 - Endocrinology

A 52-year-old man who works as an HGV driver comes to the clinic for review.

He is currently taking metformin 1 g twice daily. On examination his blood pressure is 142/80 mmHg, and his BMI is 42. His latest pre-clinic HbA1c is 8.8%.

Which of the following according to the ADA/EASD consensus would be the most appropriate therapy for him?

- 1- Albiglutide
- 2- Exenatide
- 3- Liraglutide
- 4- Pramlintide
- 5- Taspoglutide

Answer & Comments

Answer: 2- Exenatide

The consensus recommends the use of proven therapies (sulphonylurea or insulin) as first choice add-in options to metformin.

However in special situations, for example, morbid obesity or risk of hypoglycaemia, exenatide may be considered as an alternative.

Pramlintide is an amylin agonist, the predominant effects of which include

Reduction in glucagon

Inhibition of gastric emptying

Nausea.

The guidelines do not recommend it, and it is only licensed in the United States as an adjunct to insulin therapy.

Albiglutide is a weekly GLP-1 analogue in development. Liraglutide is a daily GLP-1 analogue which shares close homology with human GLP-1.



[Q: 2243] OnExamination 2012 - Endocrinology

A 68-year-old man comes to the clinic for review. His current medication includes metformin 1 g twice daily for his type 2 diabetes.

Most recently he has noticed his morning fasting home monitored blood sugars rising

above 7 mmol/l, and his HbA1c has risen to 8.3% just prior to his clinic visit.

On examination his BMI is 29.

According to the ADA/EASD consensus, which of the following is the most appropriate additional therapy for him?

- 1- Chlorpropamide
- 2- Glibenclamide
- 3- Gliclazide
- 4- Prandial insulin
- 5- Sitagliptin

Answer & Comments

Answer: 3- Gliclazide

The consensus recommends the addition of either insulin or sulphonylurea at step two, as proven blood glucose lowering therapies.

It does not recommend use of older first generation sulphonylureas such as chlorpropamide or glibenclamide, instead recommending use of newer agents such as glipizide, glimepiride or gliclazide.

Sitagliptin is currently not recommended as a step two choice in the consensus.



[Q: 2244] OnExamination 2012 - Endocrinology

A 49-year-old man with newly diagnosed type 2 diabetes comes to the clinic for review.

He is an avid user of the internet and wants to know by what criteria the recommended treatments for his diabetes are decided.

According to the ADA/EASD consensus, which of the following principles is the one upon which therapeutic choices should be based?

- 1- Ability to achieve and maintain glycaemic target
- 2- Lack of weight gain
- 3- Proven avoidance of macrovascular complications

- 4- Proven avoidance of microvascular complications
- 5- Relative safety versus other options

Answer & Comments

Answer: 1- Ability to achieve and maintain glycaemic target

The consensus authors state that ability to achieve and maintain glycaemic control is the most important factor when selecting between diabetes therapies, with

Safety

Tolerability

Side-effects

Ease of use

Expense

being other factors of importance.



[Q: 2245] OnExamination 2012 - Endocrinology

A 59-year-old man is diagnosed with type 2 diabetes after suffering an acute myocardial infarction.

His discharge medication from the cardiac unit includes ramipril 10 mg daily, atorvastatin 10 mg daily, aspirin 75 mg and furosemide 40 mg daily. You are asked to review him for his diabetes care.

On examination his BP is 142/82 mm/Hg, his BMI is 31 kg/m².

Investigations show:

Haemoglobin 13.1 g/dl(13.5-18)

White cell count $5.0 \times 10^9/L$ (4-10)

Platelets $199 \times 10^9/L$ (150-400)

Sodium 140 mmol/l (134-143)

Potassium 5.4 mmol/l (3.5-5)

Creatinine 152 $\mu\text{mol/l}$ (60-120)

Fasting glucose 9.2 mmol/l (<7.0)

According to the ADA/EASD consensus algorithm, which of the following initial therapies would be most appropriate for him in addition to diet and lifestyle measures?

- 1- Gliclazide
- 2- Metformin
- 3- Pioglitazone
- 4- Exenatide
- 5- Sitagliptin

Answer & Comments

Answer: 1- Gliclazide

In this case, metformin therapy is not recommended, due to the creatinine of 152.

The presence of furosemide, for presumptive treatment of cardiac failure, rules out use of pioglitazone.

Of the choices remaining, the consensus states that in patients who are unable to take metformin, sulphonylurea (SU) or insulin are the other options; so in this case gliclazide monotherapy is the most appropriate option.



[Q: 2246] OnExamination 2012 - Endocrinology

A 29-year-old woman presents to the clinic with diarrhoea which has been progressively worsening over the past six months. Multiple stool samples have proved negative over the past few weeks.

Her GP has been giving her loperamide to no effect. You understand there is a history in the family of hyperparathyroidism, and that her father had a tumour which caused hypoglycaemia. An ultrasound reveals a suspected pancreatic tumour.

Which of the following is a likely feature on biochemistry testing?

- 1- Hyperkalaemia
- 2- Hyponatraemia
- 3- Hypokalaemia

- 4- Increased bicarbonate
5- Increased pH

Answer & Comments

Answer: 3- Hypokalaemia

Decreased pH rather than increased pH occurs because it is small bowel secretions which increase in volume rather than stomach acid.

Hyperkalaemia does not occur, serum bicarbonate is decreased due to bicarbonate loss.

Hypernatraemia would only be seen in a state of severe dehydration.



[Q: 2247] OnExamination 2012 - Endocrinology

A 78-year-old woman with type 2 diabetes and rheumatoid arthritis is brought to the medical admissions unit with confusion. She can give no useful history.

There is a swollen right knee, and a temperature of 38.6°C. A BM reading records 24.8 mmol/l.

Which of the following statements in relation to her condition is correct?

- 1- Insulin inhibits ketogenesis
- 2- Mortality risk is low
- 3- The patient is likely to be hypo-osmolar
- 4- There is osmotic shift to the extravascular space
- 5- Urine dipstick reveals reduced specific gravity

Answer & Comments

Answer: 1- Insulin inhibits ketogenesis

The diagnosis in this patient is hyperglycaemic hyperosmolar non-ketotic coma (HONK or more accurately HHNC). In general there is enough insulin in patients with type 2 diabetes to suppress ketogenesis, but

insufficient to prevent hyperglycaemia and the hepatic resistance to glucagon.

The risk of mortality in HONK is 10-20%, with a strong predilection to thrombotic events. In general, HONK results in osmotic fluid shift to the intravascular space.

Urinalysis reveals increased specific gravity denoting dehydration.



[Q: 2248] OnExamination 2012 - Endocrinology

A 48-year-old lady has obesity with a BMI of 37 kg/m² and her waist measurement is 115 cm (which is very high). She gained most of the weight about 10 years ago and since that time she has tried many different forms of diets and weight-loss clubs. Although she enjoys swimming she is finding it harder to keep up her exercise and walking is restricted to a few hundred metres because of foot pain.

On further questioning, it is evident that her diet is quite reasonable consisting of about 1800 KCal per day. She eats breakfast, bases her meals on starchy foods, eats plenty of fibre and at eats at least five portions of vegetables or fruit per day.

Which of the following management strategies according to NICE guidance on obesity (published December 2006) would be advisable for this lady?

- 1- Diet and physical activity, consider drugs
- 2- Extended period, very low calorie diet
- 3- General advice on healthy weight and lifestyle
- 4- Referral for bariatric surgery
- 5- Referral to specialist obesity service

Answer & Comments

Answer: 1- Diet and physical activity, consider drugs

NICE recommendations are first to classify the level of this lady's obesity. This can easily be

achieved by looking at the tables in the NICE quick-reference guide on obesity.

Classification BMI kg/m²

Healthy weight 18.5-24.9

Overweight 25-29.9

Obesity I 30-34.9

Obesity II 35-39.9

Obesity III 40 or more

Her waist circumference is very high (>88 cm) and, in the absence of co-morbidities, we can see that the initial management should be diet and exercise with consideration of drug treatment which should be discussed.

Extended period (longer than 12 weeks) low-calorie diet and bariatric surgery may be considered but would warrant specialist referral.



[Q: 2249] OnExamination 2012 - Endocrinology

A 19-year-old male presents with concerns regarding his pubertal development.

On examination he is 1.8 m tall, thin and has little pubic and axillary hair. Both testes are approximately 5 ml in volume (NR 15 ml). No other abnormalities are encountered.

Investigations reveal:

LH 3.3 mU/l (3-10)

FSH 5.5 mU/l (3-10)

Testosterone 5.5 nmol/l (9-30)

Which of the following is the most likely diagnosis?

- 1- Anorexia nervosa
- 2- Craniopharyngioma
- 3- Kallmann's syndrome
- 4- Klinefelter's syndrome
- 5- Primary testicular failure

Answer & Comments

Answer: 3- Kallmann's syndrome

This young male has delayed puberty with hypogonadotrophic hypogonadism. The most likely explanation would be Kallmann's syndrome.

Klinefelter's would be associated with elevated luteinising hormone/follicle stimulating hormone (LH/FSH), as would primary testicular failure.

His height of 1.8 m, suggesting that he is tall, would argue against this being anorexia despite his thin appearance. If anorexia had preceded puberty then his stature should also have been affected.

The only other possibility is craniopharyngioma, but this is probably less likely in an otherwise well man, and other possible features should be included to suggest this diagnosis.

You may wish to cry foul at this point, and say that anosmia should be given as a clue to Kallmann's; however, in reality, how often do you ask about sense of smell, let alone test for it



[Q: 2250] OnExamination 2012 - Endocrinology

A 40-year-old man was found to have acromegaly.

What is the most likely cause of death if treatment is unsuccessful?

- 1- Colorectal carcinoma
- 2- Diabetic nephropathy
- 3- Gastric carcinoma
- 4- Left ventricular failure
- 5- Increased intracranial pressure

Answer & Comments

Answer: 4- Left ventricular failure

If treatment of acromegaly is unsuccessful the death rate from cardiovascular, cerebrovascular, respiratory and malignant disease is two to four times that of the general population.

Classically the malignancy associated with acromegaly is tumour of the large intestine.

Mortality is typically due to a cardiovascular cause if the condition is untreated. Thus heart failure is probably a more common cause of death than colonic neoplasia.



[Q: 2251] OnExamination 2012 - Endocrinology

A 58-year-old male is admitted with a blood pressure of 210/120 mmHg and episodic runs of ventricular tachycardia (VT).

Investigations confirm the presence of a right adrenal phaeochromocytoma.

Which one of the following would be the most appropriate initial therapy?

- 1- Amiodarone
- 2- Atenolol
- 3- Lidocaine
- 4- Phenoxybenzamine
- 5- Propafenone

Answer & Comments

Answer: 4- Phenoxybenzamine

This patient has catecholamine-induced severe hypertension and associated paroxysmal ventricular tachycardia.

The patient should initially be alpha-blocked with phenoxybenzamine and then β -blockers introduced.

This should control the runs of VT but for sustained VT lidocaine can be acutely used.



[Q: 2252] OnExamination 2012 - Endocrinology

In the treatment of congenital adrenal hyperplasia (CAH), which of the following statements is correct?

- 1- Efficacy of treatment is best monitored by 17-OH progesterone and androstenedione levels
- 2- Hydrocortisone may be administered once daily
- 3- Hypotension, hyperkalaemia and hyperreninaemia suggest that the dose of mineralocorticoid should be reduced
- 4- Preferred treatment in children is prednisone
- 5- Renin activity levels are of no clinical use in treatment monitoring

Answer & Comments

Answer: 1- Efficacy of treatment is best monitored by 17-OH progesterone and androstenedione levels

In the treatment of CAH the lowest dose of glucocorticoid that suppresses (not totally) adrenal androgens, whilst maintaining normal growth and weight gain, is the optimum dose of glucocorticoid replacement.

Renin activity levels can be used to monitor adequacy of mineralocorticoid and sodium replacement.

Hydrocortisone has a relatively short half life and must therefore be administered twice daily, whilst the preferred mode of glucocorticoid replacement in children is hydrocortisone as it minimises growth suppression.

Over-treatment with mineralocorticoids leads to hypertension, suppressed plasma rennin activity and possibly growth retardation.



[Q: 2253] OnExamination 2012 - Endocrinology

A 60-year-old man who was previously fit and well presented with a six week history of blurring of vision.

His investigation revealed a fasting plasma glucose of 12.9 mmol/L (3.0 - 6.0).

What is the most likely cause of his blurred vision?

- 1- Cataract
- 2- Maculopathy
- 3- Osmotic changes in the lens
- 4- Proliferative diabetic retinopathy
- 5- Retinal vein thrombosis

Answer & Comments

Answer: 3- Osmotic changes in the lens

Without being given too much here, this patient is a newly diagnosed diabetic as we are told he was previously fit and well.

Therefore the most probable explanation for his blurred vision is osmotic change.



[Q: 2254] OnExamination 2012 - Endocrinology

A 16-year-old male presents with polyuria and polydipsia.

Which of the following may confirm the diagnosis of diabetes mellitus?

- 1- A fasting plasma glucose of 7.5 mmol/L
- 2- A finding of 3+ ketonuria
- 3- An HbA1c of 6.0%
- 4- A plasma glucose of 10.2 mmol/l two hours after 75 grams of oral glucose.
- 5- A random plasma glucose of more than 7.5 mmol/L

Answer & Comments

Answer: 1- A fasting plasma glucose of 7.5 mmol/L

The diagnosis is usually relatively easy to confirm in a symptomatic subject.

A random glucose of more than 11.1 mmol/L or a fasting glucose of more than 7.0 mmol/L would be regarded as confirmatory.

There is usually glycosuria in addition to ketonuria.

Isolated ketonuria suggests fasting.

A raised glycosolated haemoglobin (HbA1c) above 6.5% is now considered diagnostic.

A glucose tolerance test is rarely needed.



[Q: 2255] OnExamination 2012 - Endocrinology

Which of the following suggests a poorer prognosis for thyroid cancer?

- 1- Age less than 30.
- 2- Cold nodule on thyroid uptake scan
- 3- High TSH concentration
- 4- Male sex.
- 5- Papillary thyroid cancer with cervical node involvement.

Answer & Comments

Answer: 4- Male sex.

Factors that suggest a poor prognosis in thyroid cancer include

Increasing age

Male sex

Poorly differentiated histological features and

Distant spread.



[Q: 2256] OnExamination 2012 - Endocrinology

A 60-year-old woman presents with vague aches and pains and has a family history of osteoporosis. She is 10 years post-menopausal but has not taken any female HRT.

Dual energy x ray absorptiometry (DEXA) is requested.

Which of the following values of bone mineral density measured by DEXA would signify osteopenia at a measured site?

- 1- A T score of -2.6
- 2- A T score of -1.8
- 3- A Z score of -2.0
- 4- A z score of -1.5
- 5- A T score of -0.9

Answer & Comments

Answer: 2- A T score of -1.8

Osteopenia is defined as a T score of between -1 and -2.5 standard deviations below the bone mineral density of a young female.

Osteoporosis is defined as <-2.5 SD.

These measurements are important as they signify a greatly increased risk of fracture.

Z scores refer to the bone mineral density compared with that of a 'normal' age matched subject.



[Q: 2257] OnExamination 2012 - Endocrinology

A 49-year-old man is referred to the clinic with possible Cushing's syndrome.

He is grossly obese having gained 8 kg during the past six months. He has hypertension on four agents and impaired glucose tolerance.

On examination his BP is 155/85 mmHg, pulse is 75 and regular and his BMI is 35.

Assuming he has Cushing's, which of the following features would you most expect on routine biochemistry?

- 1- Decreased bicarbonate
- 2- Decreased sodium
- 3- Increased bicarbonate
- 4- Increased potassium
- 5- Increased sodium

Answer & Comments

Answer: 3- Increased bicarbonate

Whilst salt and water retention occurs in conjunction with Cushing's syndrome, this does not usually lead to hyponatraemia.

Alkalosis rather than acidosis occurs.

Hypokalaemia rather than hyperkalaemia is seen in some patients.



[Q: 2258] OnExamination 2012 - Endocrinology

A chromophobe adenoma of the pituitary would be expected in which of the following?

- 1- Acromegaly
- 2- Cushing's disease
- 3- Non-functioning pituitary tumour
- 4- Prolactinoma
- 5- TSH secreting tumour

Answer & Comments

Answer: 3- Non-functioning pituitary tumour

A chromophobe adenoma refers to no uptake of dye within the tumourous specimen.

This occurs in the non-secretory/non-functioning pituitary tumours.



[Q: 2259] OnExamination 2012 - Endocrinology

A 55-year-old woman with a history of type 2 diabetes managed with BD mixed insulin comes to the clinic for review.

Her BP is within target at 130/70 mmHg, she has recently lost 4 kg and her BMI is now 28. Her most recent HbA1c is measured at 7.3%. The only abnormality of note on blood testing is triglycerides which are elevated at 2.5 mmol/l.

Which of the following correctly represents the relative increase in cardiovascular risk associated with the elevated triglycerides in this patient?

- 1- 10%
- 2- 30%
- 3- 70%
- 4- 90%
- 5- 120%

Answer & Comments

Answer: 2- 30%

The answer is option B, 30%.

Cardiovascular risk calculators apply a risk multiplier of 1.3 for triglycerides above 1.7 mmol/l.

Hypertriglyceridaemia, usually accompanied by low HDL, is the commonest lipid abnormality seen in patients with type 2 diabetes. This is associated with central adiposity and increased insulin resistance.

Whilst statins are effective in reducing LDL cholesterol in patients with type 2 diabetes, further measures are usually required in controlling hypertriglyceridaemia.



[Q: 2260] OnExamination 2012 - Endocrinology

A 49-year-old man with type 2 diabetes is managed with metformin 1 g twice daily and

has recently been started on exenatide because he is morbidly obese and still failing to achieve adequate blood glucose control.

On examination his BMI is 41.

Investigations show:

Haemoglobin 13.4 g/dl(13.5-18)

White cell count $5.2 \times 10^9/L$ (4-10)

Platelets $201 \times 10^9/L$ (150-400)

Sodium 140 mmol/l (134-143)

Potassium 5.0 mmol/l (3.5-5)

Creatinine 120 $\mu\text{mol/l}$ (60-120)

HbA1c 7.2%(<5.5)

He asks about home blood glucose monitoring.

Which of the following is most consistent with the recommendations in the consensus?

- 1- He should monitor morning fasting and post-prandial glucoses three times per week
- 2- He should monitor morning fasting and pre-prandial glucoses three times per week
- 3- He should monitor fasting glucoses every day
- 4- He should monitor fasting glucoses three times per week
- 5- He should not need to self monitor his glucoses

Answer & Comments

Answer: 5- He should not need to self monitor his glucoses

Generally, if patients are not using insulin, sulphonylureas or glinides (repaglinide or netaglinide), then the consensus does not recommend self-monitoring of blood glucose levels.

With respect to insulin titration however, self-monitored blood glucose results play a crucial part in appropriate dose adjustment.

The consensus recommends a target of between 3.9 and 7.2 mmol/l for fasting and pre-prandial glucose levels.

If fasting levels are in range yet the HbA1c is elevated, post-prandial monitoring is recommended, aiming for glucose levels of less than 10 mmol/l.



[Q: 2261] OnExamination 2012 - Endocrinology

A 52-year-old male with a history of dyslipidaemia and hypertension attends the surgery for a 75g oral glucose tolerance test (OGTT) as part of his cardiovascular risk assessment and screening for type 2 diabetes.

He is overweight with a BMI of 29 kg/m², his blood pressure is 135/85 mmHg on a combination of amlodipine and perindopril.

His venous plasma OGTT result is as follows.

0 minutes 6.3 mmol/L (3.0-6.0)

120 minutes 10.4 mmol/L (3.0-6.0)

Which of the following is the correct interpretation of these results?

- 1- Impaired fasting glucose (IFG)
- 2- Impaired fasting glucose and impaired glucose tolerance
- 3- Impaired glucose tolerance (IGT)
- 4- Normal glucose tolerance.
- 5- Type 2 diabetes

Answer & Comments

Answer: 2- Impaired fasting glucose and impaired glucose tolerance

The World Health Organization (WHO) recommend the use of the OGTT for the diagnosis of type 2 diabetes as it incorporates the fasting and two hour post glucose load which can identify different sub groups of diabetic patients and different categories of individuals at risk of type 2 diabetes.

The diagnostic criteria are:

Venous plasma glucose Fasting (mmol/l) 2 hour post glucose (mmol/l)

Diabetic > 7.0 > 11.1

IGT < 7.0 7.8-11.0

IFG 6.1-6.9 < 7.8

In the absence of marked hyperglycaemia and symptoms such as weight loss, polyuria or polydipsia these results should be confirmed by a repeat test on another day.

Reference:

<http://www.gpnotebook.co.uk/simplepage.cfm?ID=-1603600309&linkID=67387&cook=yes>



[Q: 2262] OnExamination 2012 - Endocrinology

A 53-year-old female presents with a four month history of weight gain, episodic sweats and shakiness which occur during episodes of fasting and are relieved by eating chocolate bars.

She informs you that she has a friend who is a nurse and has provided her with a glucose meter. During one of these episodes the glucose concentration was recorded at 2.8 mmol/l (3.0-6.0).

On examination she has a body mass index of 30.2 kg/m², a pulse of 82 bpm and a blood pressure of 144/86 mmHg. No other abnormalities are noted.

Which of the following is the most appropriate next investigation for this woman?

- 1- 72 hour fast
- 2- Fasting insulin and C peptide measurement
- 3- MRI pancreas
- 4- Oral glucose tolerance test
- 5- Sulphonylurea measurement

Answer & Comments

Answer: 1- 72 hour fast

This woman has features of spontaneous hypoglycaemia which is relieved by eating and precipitated by fasting and exercise.

The most relevant investigation to prove or disprove this would be a 72 hour fast which has a virtual 99% sensitivity. If proven then further investigation for an insulinoma or factitious hypoglycaemia is warranted.



[Q: 2263] OnExamination 2012 - Endocrinology

A 38-year-old man presented with intermittent severe headaches. He was prescribed spironolactone 50 mg and bendroflumethiazide 2.5 mg daily for hypertension.

On examination his pulse was 112 beats per minute, with regular rhythm, and blood pressure was 190/110 mmHg.

Investigations revealed:

Serum Sodium 132 mmol/L (137-144)

Serum Potassium 3.4 mmol/L (3.5-4.9)

Serum Urea 7.0 mmol/L (2.5-7.5)

Which one of the following is the most useful investigation in establishing the diagnosis?

- 1- A 24 hour urinary 5-hydroxyindoleacetic acid concentration
- 2- A 24 hour urinary catecholamine concentration
- 3- A 24 hour urinary free cortisol concentration
- 4- A radionuclide Hippuran renogram
- 5- The serum aldosterone: rennin ratio

Answer & Comments

Answer: 2- A 24 hour urinary catecholamine concentration

This question seems nebulous at first but on further investigation it is extremely complex.

The answer is unlikely to be carcinoid given the lack of symptoms of carcinoid syndrome. The flushing attacks of the carcinoid syndrome are accompanied by hypotension. Renal anatomy and function are studied with sequential images using radionuclides that are indexes of tubular function (¹³¹I Hippuran). The clinical history here is not suggestive of renal artery stenosis.

Given the patient's young age, and markedly raised BP on treatment we should consider an endocrine cause.

The electrolyte disturbance is mild and is of dubious relevance in this question.

Diuretic use may be causing the hyponatraemia and hypokalaemia, indeed the commonest cause of hypokalaemia in hypertension is diuretic therapy. However, spironolactone use could, theoretically, mask a more significant hypokalaemia.

There is no clinical history to suggest Cushing's and primary aldosteronism is not associated with a tachycardia. An aldosterone:rennin ratio would not be appropriate at this stage given that the patient is receiving spironolactone.

The history of episodic headaches is central to this question, together with the tachycardia. These paroxysmal headaches suggest the diagnosis of pheochromocytoma; often the symptoms are vague and rarely is the classical presentation encountered.

Patients with pheochromocytoma may develop a severe vascular headache (Bridgwater and Starling, 1982).

Thomas et al. (1966) reviewed the histories of 100 patients with proven pheochromocytoma seen at the Mayo Clinic and found that episodic headache was present in 80%. It was usually of rapid onset, bilateral, severe, throbbing, and associated with nausea in about half of the cases.



[Q: 2264] OnExamination 2012 -
Endocrinology

A 70-year-old male with a five year history of type 2 diabetes mellitus (T2DM) presents for annual review with a blood pressure of 188/88 mmHg.

Clinical examination was normal. An ECG reveals evidence of left ventricular hypertrophy (LVH). Urinary protein creatinine ratio (PCR) is positive.

Which one of the following drugs is the most appropriate treatment for this patient's hypertension?

- 1- Amlodipine
- 2- Atenolol
- 3- Bendroflumethiazide
- 4- Doxazosin
- 5- Ramipril

Answer & Comments

Answer: 5- Ramipril

Regarding the British Hypertensive Society guidelines and NICE guidelines on the treatment of blood pressure in T2DM, this elderly male with diabetes has isolated systolic hypertension associated with LVH (LVH being defined as a complication of hypertension) and proteinuria.

Evidence would support the use of an angiotensin converting enzyme inhibitor (ACEi) as first line treatment for patients with diabetes, in the absence of other compelling diagnoses.

Reference:

Hypertension: management of hypertension in adults in primary care NICE



[Q: 2265] OnExamination 2012 -
Endocrinology

A 17- year-old female presents with tingling and muscle cramps. There is no other past

medical history of note.

Investigations reveal:

Creatinine 68 $\mu\text{mol/L}$ (60-110)

Calcium 1.76 mmol/L (2.2-2.6)

Phosphate 1.4 mmol/L (0.8-1.4)

Albumin 38 g/L (37-49)

Which one of the following investigations is most likely to confirm the diagnosis?

- 1- Alkaline phosphatase concentration
- 2- Computerised tomography (CT) brain scanning
- 3- Parathyroid (PTH) concentration
- 4- Urine calcium concentration
- 5- Vitamin D concentration

Answer & Comments

Answer: 3- Parathyroid (PTH) concentration

This patient has low calcium which is due to hypoparathyroidism.

As PTH promotes the loss of phosphate in the urine, hypoparathyroidism is associated with a high or high-normal serum phosphate concentration.

Vitamin D deficiency is also a possibility although deficiency would have to be longstanding to cause this degree of hypocalcaemia.

Urine calcium concentrations are useful in familial hypercalciuric hypocalcaemia (as opposed to the more common familial hypocalciuric hypercalcaemia).

Hypoparathyroidism is less common than hyperparathyroidism and is associated with other autoimmune conditions such as Addison's disease, thyroid disease and type 1 diabetes mellitus. There are also a number of rarer associations such as DiGeorge syndrome.

Treatment is with alfacalcidol and monitoring is required to maintain the calcium concentration in the reference range.



[Q: 2266] OnExamination 2012 - Endocrinology

A 36-year-old male with insulin-dependent diabetes mellitus (IDDM) of three years duration presented with decreased libido and erectile dysfunction since diagnosis. No abnormalities were noted on genital examination.

Investigations revealed:

plasma testosterone 6.0 nmol/L (9 - 35)

plasma follicle stimulating hormone 1.0 u/L (1-8)

Which of the following investigations is the most appropriate next step?

- 1- Autonomic function testing
- 2- Doppler studies of penile artery
- 3- Nerve conduction studies
- 4- Serum ferritin
- 5- Serum prolactin

Answer & Comments

Answer: 4- Serum ferritin

This IDDM patient appears to have hypogonadotrophic hypogonadism (HH) as reflected by low testosterone and low follicle-stimulating hormone (FSH).

The combination is compatible with a diagnosis of haemochromatosis and measuring ferritin would be a reasonable investigation.

Haemochromatosis typically causes hypogonadotrophic hypogonadism as a consequence of the ferritin deposition within the pituitary rather than primary testicular dysfunction.

Autonomic nerve dysfunction is one of the commoner causes of impotence in a person with diabetes but in this case is not the cause of his HH.

For similar reasons, both nerve conduction studies and Doppler studies are irrelevant.

Prolactin would be a sensible measurement but probably if you were looking to confirm a diagnosis that incorporates the diabetes as well, ferritin would be the investigation of choice.



[Q: 2267] OnExamination 2012 - Endocrinology

Which of the following is a feature of Cushing's syndrome?

- 1- Calcium pyrophosphate arthropathy
- 2- Fibrous dysplasia
- 3- Osteoarthritis
- 4- Osteomalacia
- 5- Vertebral collapse

Answer & Comments

Answer: 5- Vertebral collapse

Vertebral collapse may be due to osteoporosis.

Osteoarthritis and gout would be unusual with elevated corticosteroid concentrations.

Osteomalacia is not a feature.



[Q: 2268] OnExamination 2012 - Endocrinology

A 62-year-old man with a history of type 2 diabetes mellitus takes 24 units BD of mixed insulin. His HbA1c is elevated at 8.3% yet he is having problems with hypoglycaemic episodes either late in the afternoon or during the early hours of the morning. A recent creatinine is 130 µmol/l.

On examination is BP is 148/82 mmHg, pulse is 70 and regular, respiratory and abdominal examination is unremarkable.

Which of the following is the most appropriate next step?

- 1- Advise him to eat a snack before going to bed
- 2- Decrease his BD mixtard dose by 20%
- 3- Increase his BD mixtard dose by 20%
- 4- Split his mixtard into three doses
- 5- Transition him to a basal bolus regime

Answer & Comments

Answer: 5- Transition him to a basal bolus regime

Whilst eating a snack going to bed will help avoid hypoglycaemia, it will also lead to weight gain which he should avoid.

Decreasing his mixtard dose will cause a rise in HbA1c, increasing it will worsen his hypoglycaemic episodes. Given that insulins with a better bolus profile are available, it is not appropriate to split his mixtard into three doses.



[Q: 2269] OnExamination 2012 - Endocrinology

Which of the following antibodies are typically found in auto-immune adrenalitis (Addison's disease)?

- 1- Anti-21 hydroxylase antibody
- 2- Anti-nuclear antibody
- 3- Anti-peroxidase antibody
- 4- Anti-rho antibody
- 5- Anti-tryptophan hydroxylase antibody

Answer & Comments

Answer: 1- Anti-21 hydroxylase antibody

21 Hydroxylase is the enzyme involved in the cholesterol steroid pathway and has been

found to be present in approximately 80% of cases.



[Q: 2270] OnExamination 2012 - Endocrinology

A 17-year-old woman comes to the endocrine clinic for review.

She has primary amenorrhoea. Other history of note includes having no sense of smell.

On examination her BP is 110/70 mmHg, her pulse is 65 and regular. She is 170 cm in height. There is an absence of secondary sexual hair and breast development.

Investigations show:

Haemoglobin 12.8 g/dl(11.5-16.0)

White cell count $5.9 \times 10^9/L$ (4-11)

Platelets $190 \times 10^9/L$ (150-400)

Sodium 143 mmol/l (135-146)

Potassium 3.7 mmol/l (3.5-5)

Creatinine 90 $\mu\text{mol/l}$ (79-118)

Which of the following is the most likely diagnosis?

- 1- Androgen insensitivity syndrome
- 2- Autoimmune ovarian failure
- 3- Kallman syndrome
- 4- Noonan's syndrome
- 5- Turner's syndrome

Answer & Comments

Answer: 3- Kallman syndrome

Androgen insensitivity syndrome (AIS) presentation is similar, but you would expect the sense of smell to be preserved. Often phenotypic females with AIS also have cryptorchidism where the testes present as bilateral direct inguinal hernias in infancy.

Autoimmune ovarian failure would present as secondary amenorrhoea, and development of

secondary sexual characteristics would be preserved.

Turner's is associated with short stature, webbing of the neck, hypertension and a number of other abnormalities.

Noonan's is phenotypically similar to Turner's in females, but also occurs in males.



[Q: 2271] OnExamination 2012 - Endocrinology

You are taking part in the clinical trials of a new treatment for symptomatic hypoglycaemia which is thought to have a glucagon-like action.

Which of the following features would be consistent with a glucagon-like effect?

- 1- Inhibition of catecholamine secretion
- 2- Stimulation of gastric emptying
- 3- Stimulation of glycogenesis
- 4- Stimulation of glycolysis
- 5- Stimulation of lipolysis

Answer & Comments

Answer: 5- Stimulation of lipolysis

Glucagon leads to stimulation rather than inhibition of catecholamine secretion. It delays gastric emptying and reduces pancreatic exocrine secretions.

With respect to glucose handling, glucagon stimulates glycogenolysis, at the same time inhibiting glycolysis and activating gluconeogenesis.



[Q: 2272] OnExamination 2012 - Endocrinology

A 22-year-old student nurse is admitted after a third episode of collapse whilst on attachment in the Emergency department of the hospital.

She has no past medical history of note and her only medication is the progesterone only pill. On further questioning she says she feels light-headed and hungry to the pit of her stomach before these collapses occur and tells you that none of these attacks have occurred outside the hospital.

On examination her BP is 110/70 mmHg, pulse is 78 and general physical examination is entirely normal.

Investigations show:

Haemoglobin 13.2 g/dl(11.5-16.0)

White cell count $4.4 \times 10^9/L$ (4-11)

Platelets $172 \times 10^9/L$ (150-400)

Sodium 137 mmol/l (135-146)

Potassium 4.0 mmol/l (3.5-5)

Creatinine 90 micromol/l (79-118)

Glucose (in recovery period) 8.2 mmol/l (>3.0)

Which of the following is the most appropriate next step?

- 1- Admit for a 72 hour fast
- 2- Arrange an exercise provocation test
- 3- Arrange an ultrasound abdomen
- 4- Give her glucagon to carry around in case an attack occurs
- 5- Glucose, insulin and C peptide assay at the time of an attack

Answer & Comments

Answer: 5- Glucose, insulin and C peptide assay at the time of an attack

Given all of this woman's attacks occur within the hospital, and the fact that she potentially has access to insulin, it raises the possibility of exogenous administration of insulin by the patient herself. As such the best way to differentiate between insulinoma and exogenous insulin administration is glucose, insulin and C peptide, as with self administration of insulin, C peptide is low, but in contrast with insulinoma it would be

elevated. The idea of a urine assay for sulphonylureas should also be gently introduced to her.

It is not appropriate to give her glucagon to carry around until the cause of her hypoglycaemia is properly established.

If an insulinoma is suspected, then exercise provocation is usually avoided because of the risk of serious hypoglycaemia, the majority of patients being diagnosed after a 72 hour fast.

An ultrasound of the abdomen would only be considered if an insulinoma was suspected.



[Q: 2273] OnExamination 2012 - Endocrinology

A 52-year-old South Asian woman comes to the clinic complaining of lower back, hip and thigh pain, accompanied by general fatigue and lethargy.

She has a history of hypertension for which she takes ramipril 10 mg daily, but nothing else of note. On further questioning you find out that she spends most of the day inside. On examination her BP is 142/84 mmHg, there is mild proximal muscle weakness, but no other significant findings.

Investigations show:

Haemoglobin 12.8 g/dl(11.5-16.5)

White cells $5.2 \times 10^9/L$ (4-11)

Platelet $188 \times 10^9/L$ (150-400)

Sodium 141 mmol/l (135-146)

Potassium 4.9 mmol/l (3.5-5)

Creatinine 133 $\mu\text{mol/l}$ (79-118)

Calcium 2.05 mmol/l (2.20-2.60)

HbA1c 7.3% (<5.5) (56 mmol/mol)

TSH 4.8 mU/l (0.5-5.0)

Which of the following is the most likely diagnosis?

1- Fibromyalgia

2- Hypothyroidism

3- Osteomalacia

4- Osteoporosis

5- Myositis

Answer & Comments

Answer: 3- Osteomalacia

Osteomalacia is related to low levels of vitamin D and occurs more commonly in patients of South Asian origin, particularly those who have a cultural tendency to spend more time inside.

Symptoms include bony pain, particularly around the hips and lower back, and proximal myopathy.

The low calcium seen on routine blood testing fits with this diagnosis, phosphate is likely to be low, with raised alkaline phosphatase.

Management in this case involves vitamin D supplementation, dietary review to encourage adequate dairy intake, and encouragement to spend more time in the sun.

A. Fibromyalgia is incorrect because the low calcium points us towards an alternative diagnosis, and her pain is confined to a limited region.

B. Hypothyroidism is incorrect because the thyroid-stimulating hormone (TSH) is at the upper end of the normal range.

C. Osteomalacia is correct given this woman's ethnic origin, her symptoms and her low calcium level.

D. Osteoporosis is incorrect because we are not given evidence of fracture, bone mineral density, and the low calcium and proximal myopathy are more in keeping with osteomalacia.

E. Myositis is incorrect because there is no evidence of generalised myopathy, and if this were the diagnosis we might expect a creatine kinase (CK) level in the investigations provided.



[Q: 2274] OnExamination 2012 -
Endocrinology

A 38-year-old patient comes to the clinic with hypertension he is finding difficult to control.

Despite taking ramipril 10 mg, atenolol 50 mg and amlodipine 10 mg, his BP is 155/97 mmHg. He has no other significant past medical history. His BMI is 22 and general examination is unremarkable.

Investigations show

Haemoglobin 13.5 g/dl(13.5-17.7)

White cells $7.9 \times 10^9/L$ (4-11)

Platelets $231 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 3.1 mmol/l (3.5-5)

Creatinine 95 $\mu\text{mol/l}$ (79-118)

Spot aldosterone:renin ratio 830

Which of the following is the most appropriate next step to optimise his management?

- 1- Add doxazosin
- 2- Add indapamide
- 3- Add moxonidine
- 4- Echocardiogram
- 5- MRI abdomen

Answer & Comments

Answer: 5- MRI abdomen

The spot aldosterone:renin ratio greater than 800 raises the strong possibility that this man is suffering from hyporeninaemic hyperaldosteronism. Quite marked hypokalaemia, even in the presence of ACE inhibition, is a further pointer to the diagnosis.

MRI abdomen is the investigation that is likely to confirm the possibility of an adrenal adenoma.

Whilst addition of further anti-hypertensives may drive his blood pressure closer to goal

they are unlikely to be effective and surgery is the most appropriate intervention.

B-blockers, however, can significantly raise the aldosterone:renin ratio, increasing the risk of false positives.



[Q: 2275] OnExamination 2012 -
Endocrinology

A 73-year-old woman presented with thirst and polyuria of six months duration.

She had suffered several episodes of lower back pain. She was on no medication.

On examination she looked well, had a dorsal kyphosis and a blood pressure of 170/95 mmHg.

Investigations revealed:

Erythrocyte sedimentation rate 15 mm/1st hour (0-30)

Serum Urea 11.9 mmol/L (2.5-7.5)

Serum Creatinine 175 $\mu\text{mol/L}$ (60-110)

Serum Albumin 40 g/L (37-49)

Serum total Calcium 2.98 mmol/L (2.2-2.6)

What is the most likely cause of this lady's hypercalcaemia?

- 1- Metastatic breast cancer
- 2- Myeloma
- 3- Osteoporosis
- 4- Primary hyperparathyroidism
- 5- Sarcoidosis

Answer & Comments

Answer: 4- Primary hyperparathyroidism

The prevalence of hyperparathyroidism is said to be four per 1000 in women over 60, and is two to three times more common in women than men.

The lower back pain may be loin pain due to renal colic caused by renal calculi or due to osteoporosis. The renal impairment may be

associated with renal calculi, perhaps due to calculi-induced hydronephrosis in extreme cases. Renal impairment in hyperparathyroidism is not uncommon. Chronic hypercalcaemia can compromise the renal concentrating ability leading to polydipsia and polyuria.

The kyphosis may be due to osteoporosis which is commonly seen in conjunction with hyperparathyroidism. Classically, hypertension has been associated with hyperparathyroidism.

Associated with myeloma one would expect a drop in albumin concentration together with a markedly elevated erythrocyte sedimentation rate (ESR).



[Q: 2276] OnExamination 2012 - Endocrinology

A 34-year-old man presents with a six month history of tiredness, weight gain and cold intolerance.

On examination he appeared hypothyroid and had a firm goitre.

Investigations reveal:

Free T₄ 6 pmol/l (10-22)

TSH 55 mU/l (0.4-5.0)

What is the most likely diagnosis in this patient?

- 1- De Quervain's thyroiditis
- 2- Hashimoto's thyroiditis
- 3- Iodine deficiency
- 4- Pendred's syndrome
- 5- Primary atrophic hypothyroidism

Answer & Comments

Answer: 2- Hashimoto's thyroiditis

Irrespective of gender, the most likely diagnosis in this hypothyroid man is Hashimoto's disease.

Iodine deficiency is extremely unlikely in the United Kingdom.

Elevated De Quervain's thyroiditis would be associated with acute presentation with a painful goitre, raised temperature and weight loss. Thyroid function tests may be transiently abnormal, often high, but hypothyroidism may ensue.

Pendred's syndrome is hypothyroidism due to dysmorphogenesis, goitre and sensorineural deafness.

Atrophic hypothyroidism would not be associated with goitre.



[Q: 2277] OnExamination 2012 - Endocrinology

A previously well 60-year-old lady is admitted with an acute anterior myocardial infarction. A random blood glucose concentration was found to be 12.1 mmol/L (<6.7).

What is the optimal management of her blood sugar?

- 1- Commence gliclazide
- 2- Commence intravenous insulin plus dextrose
- 3- Commence metformin
- 4- Commence subcutaneous insulin
- 5- No therapy other than continued dietary control

Answer & Comments

Answer: 2- Commence intravenous insulin plus dextrose

The DIGAMI study has demonstrated that there is a survival advantage in initially treating such patients with elevated glucose concentrations with sliding scale insulin for 24 hours post-infarct and then switching to three months subcutaneous insulin. (Almbrand B, Johannesson M, Sjostrand B, Malmberg K, Ryden L. Cost Effectiveness of Intense Insulin

Treatment after Acute Myocardial Infarction in Patients with Diabetes Mellitus. Results from the DIGAMI study Eur Heart J 2000; 21: 733-39).

However, DIGAMI 2 contested these results suggesting no survival benefits between insulin or oral hypoglycaemic agents (OHAs).

However, in the acute setting insulin sliding scale needs to be used.



[Q: 2278] OnExamination 2012 - Endocrinology

A 50-year-old man with a history of diabetes mellitus and hypertension attends an ophthalmic clinic for regular assessment.

On fundoscopy he is diagnosed to have preproliferative diabetic retinopathy.

Which of the following is characteristic of preproliferative diabetic retinopathy?

- 1- Hard exudates
- 2- Macular oedema
- 3- Microaneurysms
- 4- New vessels at the disc
- 5- Venous beading

Answer & Comments

Answer: 5- Venous beading

Microaneurysms and hard exudates are features of background diabetic retinopathy.

Macular oedema is associated with microaneurysms and hard exudates and is due to fluid leakage but is not necessarily a feature pre-proliferative or proliferative retinopathy although it may still require laser photocoagulation.

Venous beading, loops and soft exudates (cotton wool spots) are characteristic of the ischaemia associated with preproliferative diabetic retinopathy.

New vessels suggest proliferative retinopathy.



[Q: 2279] OnExamination 2012 - Endocrinology

A 20-year-old woman comes to the endocrine clinic with excessive hairiness and acne.

She tells you that she has a period only every few months and when she has one it tends to be very heavy.

On examination she has obvious facial acne. Her BP is 142/78 mmHg, pulse is 72 and regular and her BMI is 30. There is facial hair and hair around her upper chest and breasts.

Investigations show:

Haemoglobin 11.9 g/dl(11.5-16.0)

White cell count $6.0 \times 10^9/l$ (4-11)

Platelets $202 \times 10^9/l$ (150-400)

Sodium 137 mmol/l (135-146)

Potassium 3.9 mmol/l (3.5-5)

Creatinine 90 $\mu\text{mol/l}$ (79-118)

Total testosterone normal

Free androgen index elevated

LH / FSH ratio 2.2

Which of the following is the most likely diagnosis?

- 1- Cushing's syndrome
- 2- Germ cell tumour
- 3- Polycystic ovarian syndrome
- 4- Testicular feminisation
- 5- Turner's syndrome

Answer & Comments

Answer: 3- Polycystic ovarian syndrome

Cushing's is incorrect as more features including marked obesity, hypertension, and impaired glucose tolerance would be expected.

A germ cell tumour would be expected to result in higher androgen levels.

Testicular feminisation results in an absence of secondary sexual hair.

Turner's syndrome results in primary amenorrhoea.



[Q: 2280] OnExamination 2012 - Endocrinology

A 36-year-old man attends clinic with his wife after failing to conceive after 10 years of marriage.

Examination reveals that he is tall, thin and has bilateral gynaecomastia. Investigations show high levels of urinary gonadotrophins.

What is the most likely diagnosis?

- 1- Andropause
- 2- Gaucher's disease
- 3- Klinefelter's syndrome
- 4- Marfan syndrome
- 5- Noonan's syndrome

Answer & Comments

Answer: 3- Klinefelter's syndrome

Gaucher's and Marfan syndrome do not present with infertility.

Noonan's is associated with short stature.

Klinefelter's is a sex chromosome disorder affecting 1:400 - 1:600 male births typically with 47 XXY, XXXYY or XXYY.

Andropause is the term for the gradual decrease in serum testosterone concentration with age, but does not occur, usually, until after the age of 50.



[Q: 2281] OnExamination 2012 - Endocrinology

A 21-year-old woman who is known to suffer from an eating disorder presents to the clinic with increased lethargy, muscle weakness and fasciculations. She tells you that she has even less appetite than usual.

On examination her BP is 105/72 mmHg, pulse is 68 and regular. Her BMI is 16.5.

Investigations show:

Haemoglobin 11.2 g/dl (11.5-16.0)

White cell count $6.1 \times 10^9/L$ (4-11)

Platelets $178 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 3.8 mmol/l (3.5-5)

Creatinine 81 micromol/l (79-118)

Calcium 2.18 mmol/l (2.2-2.61)

Which of the following is the most likely diagnosis?

- 1- Hypocortisolaemia
- 2- Hypoglycaemia
- 3- Hypomagnesaemia
- 4- Hypophosphataemia
- 5- Hypothyroidism

Answer & Comments

Answer: 3- Hypomagnesaemia

Low magnesium (below 0.7 mmol/l) can be seen in protein malnutrition states which include anorexia and eating disorders.

Symptoms include

Lethargy

Fatigue

Muscle weakness including fasciculations

Changes in personality and

Lack of appetite.

Most patients respond to oral magnesium supplementation.

Given her relatively normal electrolyte status, low cortisol is very unlikely.

We also have no evidence of weight gain, hair loss, skin or menstrual cycle changes to support hypothyroidism.

Hypophosphataemia may occur in this population but is usually related to re-feeding syndrome.

Given glucose production by the liver, hypoglycaemia is extremely rare, even in severe eating disorders.



[Q: 2282] OnExamination 2012 - Endocrinology

A 25-year-old man presents to the endocrine clinic for review after investigations for a raised prolactin. He originally presented to his GP with tiredness.

On examination his BP is 110/70 mmHg, pulse is 70 and regular. There are no abnormal findings at all on general examination.

Investigations show:

Haemoglobin 13.8 g/dl (13.5-17.7)

White cell count $6.0 \times 10^9/L$ (4-11)

Platelets $178 \times 10^9/L$ (150-400)

Sodium 137 mmol/l (135-146)

Potassium 3.9 mmol/l (3.5-5)

Creatinine 95 $\mu\text{mol/l}$ (79-118)

TSH 1.5 IU/l (0.5-4.5)

Prolactin 820 mU/l (<400)

MRI pituitary normal

Which of the following correctly reflects what will most likely happen to his prolactin over the next six months?

- 1- It will fall by 50%
- 2- It will fall by 75%
- 3- It will increase by 50%
- 4- It will increase by 75%
- 5- It will stay the same

Answer & Comments

Answer: 5- It will stay the same

A reduction in prolactin levels occurs in around 1/3rd of people presenting with idiopathic hyperprolactinaemia.

A further increase in prolactin is seen in the remainder of those who present initially, but not over the six month time period.



[Q: 2283] OnExamination 2012 - Endocrinology

A 45-year-old man presents with a change in his facial appearance over the past few years, soft tissue swelling, and difficult to manage hypertension.

His GP is concerned that he may have acromegaly and tests an IGF-1 which is elevated, a pituitary MRI confirms an adenoma.

Which of the following describes the most likely defect within somatotrophs resulting in increased growth hormone release?

- 1- Elevation in ATP
- 2- Elevation in cyclic AMP
- 3- Elevation in GTP
- 4- Mutation in the beta sub-unit of the GTP binding protein
- 5- Mutation in the gamma sub-unit of the GTP binding protein

Answer & Comments

Answer: 2- Elevation in cyclic AMP

A significant percentage of growth hormone secreting tumours are thought to have a mutation in the alpha sub-unit of the stimulatory guanosine triphosphate (GTP) binding protein.

This leads to persistent elevation of cyclic adenosine monophosphate (AMP) and hence production of excess growth hormone.



[Q: 2284] OnExamination 2012 - Endocrinology

A 37-year-old woman is trying for a child with her new partner.

She is very concerned as she has had no menstrual periods for the past seven months, but serial pregnancy tests have proved negative.

If she has entered the menopause then which of the following blood tests would fit most with this picture?

- 1- Elevated FSH
- 2- Elevated oestradiol
- 3- Low LH
- 4- Low LHRH
- 5- Low testosterone

Answer & Comments

Answer: 1- Elevated FSH

Testosterone levels vary in women and are increased in women who are overweight because of peripheral conversion to androgens in fat, and in patients with polycystic ovarian syndrome.

Low luteinising hormone (LH) is not consistent with the menopause, nor is low luteinising hormone-releasing hormone (LHRH), as sex hormone releasing hormones would be elevated in an attempt to drive LH and follicle-stimulating hormone (FSH) release.

Elevated oestradiol is not associated with ovarian failure.



[Q: 2285] OnExamination 2012 - Endocrinology

A 28-year-old woman presents to the clinic complaining of increasingly heavy periods, where she bleeds for more days each month. These have changed over the course of the past few months. She does not take regular

contraception and does not have a regular partner.

On examination her BP is 145/80 mmHg, her pulse is 70 and regular, and her BMI is 26.

Investigations show:

Haemoglobin 10.2 g/dl (11.5-16.0)

White cell count $6.0 \times 10^9/L$ (4-11)

Platelets $198 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 4.1 mmol/l (3.5-5)

Creatinine 108 $\mu\text{mol/l}$ (79-118)

Glucose 5.4 mmol/l (<7.0)

Which of the following hormonal changes is most likely to be found in this patient?

- 1- Decreased TSH
- 2- Hyperinsulinaemia
- 3- Increased testosterone
- 4- Low normal prolactin
- 5- Markedly elevated prolactin

Answer & Comments

Answer: 4- Low normal prolactin

Markedly elevated prolactin is associated with amenorrhoea, as is decreased thyroid-stimulating hormone (TSH), associated with hyperthyroidism and decreased heaviness of menses.

Increased testosterone and hyperinsulinaemia may be associated with polycystic ovarian syndrome, resulting in decreasing frequency of periods which are heavier in nature.



[Q: 2286] OnExamination 2012 - Endocrinology

A 54-year-old man comes to the clinic for review of type 2 diabetes. He is noted to have a BMI of 33 and a particularly elevated waist/hip ratio. You suspect that he has elevated central adiposity.

Which of the following markers fits best with increased central adiposity?

- 1- Low alanine aminotransferase
- 2- Low plasma urate
- 3- Raised HDL cholesterol
- 4- Raised LDL cholesterol
- 5- Raised triglycerides

Answer & Comments

Answer: 5- Raised triglycerides

The answer is option E, raised triglycerides.

Raised triglycerides are indicative of disordered free fatty acid handling, a sign of inability of fat cells to store lipid; this is associated with peripheral insulin resistance and abnormal glucose levels.

Disordered free fatty acid handling is associated with increased central fat, increased cardiovascular risk, and hepatic steatosis. Weight loss is an important treatment option in this case.

In such cases you should consider looking for other features of the metabolic syndrome.



[Q: 2287] OnExamination 2012 - Endocrinology

A 62-year-old man comes to the surgery for review.

He has a history of peripheral vascular disease, characterised by intermittent claudication, particularly when he walks up a slight incline. He has a history of smoking 20 cigarettes per day.

Medication includes amlodipine 10 mg, valsartan 40 mg and atorvastatin 10 mg.

On examination his BP is 135/72 mmHg, his pulse is 82. His BMI is 32. There are trophic changes on examination of both legs consistent with chronic peripheral vascular disease.

Investigations show:

Haemoglobin 12.3 g/dl (13.5-17.7)

White cells $6.2 \times 10^9/L$ (4-11)

Platelet $234 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (135-146)

Potassium 4.2 mmol/l (3.5-5)

Creatinine 118 micromol/l (79-118)

HDL cholesterol 0.8 mmol/l (0.8-1.8)

LDL cholesterol 2.0 mmol/l (<4.0)

Triglycerides 2.8 mmol/l (0.7-2.1)

Glucose 6.2 mmol/l (<7.0)

Which of the following is the most appropriate way to impact on his cardiovascular risk?

- 1- Add in a fibrate or omega 3 fatty acids
- 2- Further reduce his blood pressure
- 3- Increase his dose of atorvastatin
- 4- Start metformin
- 5- Start pioglitazone

Answer & Comments

Answer: 1- Add in a fibrate or omega 3 fatty acids

The answer is option A, add in a fibrate or omega 3 fatty acids.

This patient's blood pressure is relatively close to target, and increasing his blood pressure medication is unlikely to impact much further on his overall cardiovascular risk profile.

Statins also result in only a modest reduction in triglycerides versus their impact on LDL cholesterol.

Other options (metformin or pioglitazone) centre on the fact that he has impaired fasting glucose, but in reality neither agent is licensed for the treatment of pre-diabetes.

As such the most appropriate option is to consider medication such as a fibrate or omega 3 fatty acids, target at triglyceride

reduction. Triglycerides above 1.7 are thought to be associated with around a 30% relative increase in cardiovascular disease events.



[Q: 2288] OnExamination 2012 - Endocrinology

A 42-year-old woman comes to the clinic complaining of weight loss of 3 kg over the course of the past six weeks, heat intolerance and palpitations. She is referred by her GP with abnormal thyroid blood tests; apparently her mother also suffered from an overactive thyroid gland.

On examination she has a BMI of 19 kg/m², her BP is 142/72 mmHg and her pulse is 95. She has a fine tremor. Her thyroid is diffusely enlarged.

Investigations show

Haemoglobin 13.0 g/dl(11.5-16.5)

White cell count 8.2 x 10⁹/L (4-11)

Platelets 170 x 10⁹/L (150-400)

Serum Sodium 141 mmol/l (135-146)

Serum Potassium 4.2 mmol/l (3.5-5)

Creatinine 110 µmol/l (79-118)

TSH <0.05 mU/l (0.5-5.0)

Anti-thyroid antibody Positive

Which of the following findings on examination or investigation would you also expect?

- 1- Decreased sex hormone-binding globulin (SHBG) levels
- 2- Decreased uptake on thyroid scan, with one 'hot' area
- 3- Globally decreased uptake on thyroid scan
- 4- Orange peel skin on both shins
- 5- Periods of bradycardia on 24 hour tape recording

Answer & Comments

Answer: 4- Orange peel skin on both shins

Graves' thyrotoxicosis is associated with pre-tibial myxoedema, commonly described as orange peel skin present on both shins. It is usually associated with

Tachycardia

Increased levels of SHBG

Globally increased uptake on thyroid scan.

Decreased uptake on the scan and one hot area would be a feature of a thyroxine producing thyroid adenoma.

Currently this patient has no features consistent with Graves' ophthalmopathy, but these may become apparent later in the time course of the disease.



[Q: 2289] OnExamination 2012 - Endocrinology

A 58-year-old woman with a history of Hashimoto's disease and hypothyroidism presents to the emergency department some 24 hours after taking 80 x 100 microgram tablets of thyroxine because she intended to kill herself.

On examination her BP is 135/84 mmHg, and she has a resting tachycardia of 122.

Investigations show

Haemoglobin 13.4 g/dl(11.5-16.5)

White cell count 5.2 x 10⁹/L (4-11)

Platelets 191 x 10⁹/L (150-400)

Sodium 141 mmol/l (135-146)

Potassium 4.0 mmol/l (3.5-5)

Creatinine 105 µmol/l (79-118)

ECG Confirms tachycardia, but no ischaemic changes seen

Which of the following is the most appropriate way to manage her overdose?

- 1- Activated charcoal
- 2- Carbimazole
- 3- Diazepam

4- Propranolol

5- Propylthiouracil

Answer & CommentsAnswer: 4- Propranolol

Overdoses of thyroxine are relatively rare, and a number of strategies have been described in their management.

In reality, patients may be partially protected from thyroid hormone excess by production of reverse T3. As such, the vast majority can be managed with regular propranolol to alleviate symptoms of tachycardia and anxiety.

In severe cases, plasmapheresis to remove protein bound thyroxine, and cholestyramine to reduce enterohepatic circulation of thyroxine have been advocated.



[Q: 2290] OnExamination 2012 - Endocrinology

A 38-year-old woman is about to be discharged after a thyroidectomy when she reports to the FY2 that she has a hoarse voice. You fear a recurrent laryngeal nerve injury.

Which of the following structures is most closely related to the recurrent laryngeal nerve?

- 1- Brachiocephalic vein
- 2- Carotid artery
- 3- Inferior thyroid artery
- 4- Jugular vein
- 5- Superior thyroid artery

Answer & CommentsAnswer: 3- Inferior thyroid artery

The superior thyroid artery runs closest to the superior laryngeal nerve.

The carotid artery, jugular vein and brachiocephalic vein do not have a close relationship to the recurrent laryngeal nerve.



[Q: 2291] OnExamination 2012 - Endocrinology

You review a 54-year-old man with respect to his diabetes control. He has had type 2 diabetes for some five years and currently takes metformin 1 g twice daily.

There is a history of hypertension for which he takes ramipril and amlodipine, and he has microalbuminuria.

On examination his BMI is 27 (lost 4 kg over the past six months but not by trying), and his BP is 143/78 mmHg.

Investigations show:

Haemoglobin 12.9 g/dl(13.5-18)

White cell count $5.3 \times 10^9/L$ (4-10)

Platelets $202 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (134-143)

Potassium 4.8 mmol/l (3.5-5)

Creatinine 124 $\mu\text{mol/l}$ (60-120)

HbA1c 9.1%(<5.5)

Total cholesterol 5.4 mmol/l (<4.5)

HDL cholesterol 0.7 mmol/l (>1.0)

According to the ADA/EASD consensus algorithm, which of the following would be the most appropriate addition to his glucose lowering therapy?

- 1- Start bedtime intermediate acting insulin
- 2- Start BD mixed insulin
- 3- Start glimepiride
- 4- Start pioglitazone
- 5- Start prandial insulin

Answer & CommentsAnswer: 1- Start bedtime intermediate acting insulin

This man's HbA1c is high at 9.1%, he has a low high density lipoprotein (HDL) cholesterol, is losing weight, and has a history of microalbuminuria.

The two established therapy options at this stage, as stated in the consensus, are either to add a sulfonylurea (SU) or insulin. Given his need for greatly improved metabolic control, insulin is the better option here.

The guidelines recommend starting with either morning or evening long-acting insulin, or with bedtime intermediate acting insulin.



[Q: 2292] OnExamination 2012 - Endocrinology

A 63-year-old patient with bipolar disorder and type 2 diabetes trips over a step and sustains an injury to her left hand. She is unable to dorsiflex her left hand, and an orthopaedic registrar diagnosis a ruptured extensor tendon.

She is receiving treatment for an infected diabetic foot ulcer.

Which of the following therapies may be implicated in this injury?

- 1- Aripiprazole
- 2- Exenatide
- 3- Fusidic acid
- 4- Levofloxacin
- 5- Naproxen

Answer & Comments

Answer: 4- Levofloxacin

The quinolones have recently been associated with tendon rupture. Rupture has been reported in the Achilles, shoulder and hand.

This may occur due to disruption of the extracellular matrix and depletion of collagen which is observed in animal models.

Aripiprazole is a second generation antipsychotic, and exenatide is a glucagon like-peptide 1 analogue used in the management of type 2 diabetes. Neither of these products has been associated with tendon rupture.



[Q: 2293] OnExamination 2012 - Endocrinology

A 60-year-old male with a 8 year history of type 2 diabetes is being treated with metformin 1g twice daily and gliclazide 160 mg twice daily. He is obese, has gained weight over the last year and his HbA1c has deteriorated from 59 to 64mmol/mol (20?42). He is being considered for treatment with either insulin or pioglitazone. The patient wants to know the side effects of pioglitazone.

Which of the following is regarded as a typical side effect of pioglitazone therapy?

For further information click on:

Pioglitazone [requires login]

- 1- Acanthosis nigricans
- 2- Fluid retention
- 3- Lactic acidosis
- 4- Myositis
- 5- Photosensitivity rash

Answer & Comments

Answer: 2- Fluid retention

Pioglitazone may cause fluid retention in up to 10% of patients. This effect may be exacerbated by concomitant use with other drugs that cause fluid retention (e.g. NSAIDs, calcium antagonists). Pioglitazone is contra-indicated in patients with cardiac failure. Weight gain with pioglitazone is caused by a combination of fat accumulation and fluid retention. Lactic acidosis is a recognised side-effect of metformin. Some sulphonylureas may cause a photosensitivity rash. Statins and fibrates are associated with myositis.



[Q: 2294] OnExamination 2012 - Endocrinology

A 52-year-old male with a five year history of type 2 diabetes is diagnosed with ischaemic heart disease and has recently commenced

simvastatin 40 mg daily, as his cholesterol was 6.2 mmol/l.

He re-attends complaining of various muscle aches and pains and you find that his liver function tests are markedly deranged, including elevated alkaline phosphatase. You stop the simvastatin and his symptoms subside but his cholesterol remains elevated at 6.3 mmol/l.

Which of the following is the most appropriate strategy to treat his hypercholesterolaemia?

- 1- Bezafibrate
- 2- Ezetimibe
- 3- No treatment required
- 4- Rosuvastatin 40 mg daily
- 5- Simvastatin 20 mg daily

Answer & Comments

Answer: 2- Ezetimibe

This patient has ischaemic heart disease and type 2 diabetes mellitus and so should be receiving a statin as his cholesterol is also elevated.

He has been intolerant of simvastatin with myalgia and raised liver function tests. The options are to consider an alternative statin or to choose a different lipid-lowering agent.

In young patients with risk factors no other lipid lowering therapy can compare with the evidence base for survival benefit from statins. Consideration should be given to using an alternative statin if possible.

Myalgia is a side effect of all statins but the incidence is probably less with rosuvastatin and pravastatin. Starting at a low dose and gradually titrating up can also minimise the risk of side effects: for example, start at 5 mg of rosuvastatin.

If starting another statin, cautious monitoring of LFTs should be performed. If there is a history of statin-related hepatitis or

rhabdomyolysis, statins should generally be avoided in the future if possible.

Consequently ezetimibe would be the most appropriate agent that would be expected to reduce cholesterol concentrations by 25%. It acts to prevent the absorption of cholesterol and is absorbed very little itself so consequently has few side effects.

Fibrates are particularly useful for hypertriglyceridaemia, but can also cause myalgia, particularly if used in combination with a statin.

Reference:

Armitage J. *The safety of statins in clinical practice. Lancet 2007; 370: 1781-90.*

Eckel RH. *Approach to the patient who is intolerant of statin therapy. J Clin Endocrinol Metab 95: 2015-2022, 2010*



[Q: 2295] OnExamination 2012 - Endocrinology

A 16-year-old female with Addison's disease is intolerant of her hydrocortisone treatment which she takes at a dose of 20 mg in the morning and 10 mg in the evening.

Which of the following doses of prednisolone would provide an equivalent daily dose to her hydrocortisone?

- 1- 5 mg
- 2- 7.5 mg
- 3- 10 mg
- 4- 12.5 mg
- 5- 15 mg

Answer & Comments

Answer: 2- 7.5 mg

The equivalent ratio of prednisolone to hydrocortisone is approximately 1:4.

For dexamethasone to hydrocortisone the ratio is roughly 1:24.

Glucocorticoid strengths



[Q: 2296] OnExamination 2012 - Endocrinology

A 40-year-old female with no prior history of thyroid disease presents with a five day history of an acutely painful, left-sided goitre. Clinically she appeared euthyroid, and was afebrile.

Investigations revealed the following:

Haemoglobin 13.0 g/dL (11.5-16.5)

White cell count $7.0 \times 10^9/L$ (4-11 $\times 10^9$)

Platelet count 200×10^9 (150-400 $\times 10^9$)

What is the most likely diagnosis?

- 1- De Quervain's thyroiditis
- 2- Haemorrhage into a cyst
- 3- Hashimoto's thyroiditis
- 4- Staphylococcal abscess
- 5- Thyroid carcinoma

Answer & Comments

Answer: 2- Haemorrhage into a cyst

The left side of this patient's goitre becomes acutely swollen with no other signs and FBC is normal which suggests acute haemorrhage into a cyst.

Thyroid cancer is usually painless.

De Quervain's thyroiditis is a diffusely tender goitre typically with systemic features such as weight loss, pyrexia and a raised erythrocyte sedimentation rate (ESR).



[Q: 2297] OnExamination 2012 - Endocrinology

Which of the following concerning diabetic retinopathy is correct?

- 1- Improved glycaemic control is more effective than hypertensive control in reducing progression of disease.
- 2- Is unusual in patients with type 2 diabetes

- 3- Normal visual acuity is seen in proliferative retinopathy.
- 4- Progression may be reduced with statin therapy
- 5- Soft exudates are a feature of background retinopathy.

Answer & Comments

Answer: 3- Normal visual acuity is seen in proliferative retinopathy.

Diabetic retinopathy occurs in both type 1 and 2 DM and may be a presenting feature in type 2 as the condition may have existed for many years prior to diagnosis.

Progression may be slowed with improved glycaemic and hypertensive control but the latter has been shown to be more effective at reducing progression (UKPDS).

There are no data at present to suggest that statin therapy reduces disease progression.

Soft exudates are a feature of pre-proliferative Rn and despite quite marked new vessel disease the visual acuity may be normal.



[Q: 2298] OnExamination 2012 - Endocrinology

A 30-year-old lady with longstanding type 1 diabetes presents with a three month history of pain and stiffness of the right shoulder.

Passive and active movements of the shoulder are equally restricted.

What is the most likely diagnosis?

- 1- Adhesive capsulitis
- 2- Calcific tendinitis
- 3- Osteoarthritis
- 4- Pyrophosphate arthropathy (pseudogout)
- 5- Rheumatoid arthritis

Answer & Comments

Answer: 1- Adhesive capsulitis

Adhesive capsulitis (frozen shoulder) is strongly associated with diabetes with as many as 40% of patients developing this problem at some stage.

The restricted active and passive movements confirm that this patient's problems are either capsular or articular in origin rather than periarticular tendon problems where active movements are generally more restricted than passive movements.

The shoulder joint is rarely affected by primary osteoarthritis.



[Q: 2299] OnExamination 2012 - Endocrinology

A 35-year-old female is found to have a solitary mass on the chest x ray.

Biopsy confirms this to be a carcinoid tumour of the lung.

Which of the following are likely to be associated with this lesion?

- 1- Carcinoid syndrome
- 2- Cushing's syndrome
- 3- Hyponatraemia
- 4- Pellagra
- 5- Pulmonary hypertension

Answer & Comments

Answer: 2- Cushing's syndrome

Carcinoid tumours of the foregut (such as lung), unlike tumours of the midgut, are not associated with carcinoid syndrome, but may secrete corticotropin-releasing hormone/adrenocorticotrophic hormone (CRF/ACTH) resulting in ectopic Cushing's syndrome.

Other associated conditions where foregut carcinoid tumours are found in the pancreas

are associated with Zollinger-Ellison syndrome and VIPoma.

A bronchial carcinoid tumour has rarely been reported in association with acromegaly (ectopic growth hormone-releasing hormone [GHRH]).

They may also be found in association with multiple endocrine neoplasia (MEN) type 1 where pancreatic neuroendocrine tumours predominate.



[Q: 2300] OnExamination 2012 - Endocrinology

Which of the following doses of prednisolone is equivalent in its glucocorticoid potency to 20mg of hydrocortisone?

- 1- 2 mg
- 2- 5 mg
- 3- 10 mg
- 4- 15 mg
- 5- 20 mg

Answer & Comments

Answer: 2- 5 mg

It is important to know the relative potencies of the glucocorticoids.

Dexamethasone for instance is roughly 30 times more potent than hydrocortisone.



[Q: 2301] OnExamination 2012 - Endocrinology

A 20-year-old male is referred with hypogonadotrophic hypogonadism. He also gives a history of an inability to smell.

Which of the following tests would assist in the diagnosis of his condition?

- 1- Enzyme linked immunosorbent assay (ELISA)
- 2- Fluorescent in situ hybridisation (FISH)
- 3- Northern blot

4- Southern blot

5- Western blot

Answer & Comments

Answer: 2- Fluorescent in situ hybridisation (FISH)

Kallman's syndrome may arise due to abnormalities of the KAL-1 or KAL-2 gene (encoding anosmin-1 and FGF-1).

Whilst the majority of cases are sporadic, perhaps up to 50% of cases are due to genetic inheritance.

Kallman's presents with hypothalamic gonadotrophin releasing hormone deficiency and deficient olfactory sense - hyposmia or anosmia.

FISH, using a specific chromosomal probe, is currently the best means of a genetic diagnosis of this condition.



[Q: 2302] OnExamination 2012 - Endocrinology

Oral therapy with which of the following may cause galactorrhoea?

- 1- Bromocriptine
- 2- Cabergoline
- 3- Cimetidine
- 4- Domperidone
- 5- Spironolactone

Answer & Comments

Answer: 4- Domperidone

Domperidone is a dopamine antagonist producing large rises in prolactin concentrations.

Spironolactone has no effect on prolactin and cimetidine produces hyperprolactinaemia only when given intravenously.

Both bromocriptine and cabergoline are dopamine agonists and reduce prolactin.



[Q: 2303] OnExamination 2012 - Endocrinology

A 48-year-old man returns from his job running a bar in Tenerife for a holiday to the United Kingdom.

He has been suffering increased bony aches and pains, particularly in his knees over the past few weeks and admits to problems in his relationship over the past year or two due to failure to 'perform in bed'.

On examination he looks tanned, his BP is 152/90 mmHg, pulse is 75 and regular and he has a BMI of 29. There are signs of chronic liver disease.

Investigations show:

Haemoglobin 16.7 g/dl(13.5-17.7)

White cell count $8.0 \times 10^9/L$ (4-11)

Platelets $298 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 4.0 mmol/l (3.5-5)

Creatinine 90 $\mu\text{mol/l}$ (79-118)

Alanine aminotransferase 90 U/l (5-40)

Fasting glucose 8.4 mmol/l (<7.0)

Ferritin 640 mcg/l (20-60)

Which of the following is the most likely unifying diagnosis?

- 1- Alcoholic liver disease
- 2- Haemochromatosis
- 3- Non-alcoholic steatohepatitis (NASH)
- 4- Type 2 diabetes
- 5- Wilson's disease

Answer & Comments

Answer: 2- Haemochromatosis

Alcoholic liver disease may result in many of the features seen, including elevation in

ferritin, but the constellation of features is more consistent with haemochromatosis.

NASH may also produce an elevation in ferritin and features of cirrhosis, but would be unlikely to produce pigmentation.

Wilson's presents at an earlier age and isolated type 2 diabetes would not ordinarily be expected to be associated with features of chronic liver disease.



[Q: 2304] OnExamination 2012 - Endocrinology

A 35-year-old man presents to the dermatology clinic with a strange rash which affects the dorsum of his hands and feet and the extensor surface of his arms. He has no past medical history of note.

On examination his BP is 122/72 mmHg, pulse is 70 and regular. He has a number of lesions, formed by rings of papules, about 1-5 cm in diameter. The centres of these lesions look depressed, with slightly increased pigmentation, but the overlying skin is normal.

Investigations show:

Haemoglobin 13.3 g/dl(13.5-17.7)

White cell count $5.6 \times 10^9/L$ (4-11)

Platelets $199 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (135-146)

Potassium 4.0 mmol/l (3.5-5)

Creatinine 92 $\mu\text{mol/l}$ (79-118)

ESR 12 mm/hr(<10)

Which of the following is the most likely diagnosis?

- 1- Erythema multiforme
- 2- Erythema nodosum
- 3- Granuloma annulare
- 4- Lichen planus
- 5- Psoriasis

Answer & Comments

Answer: 3- Granuloma annulare

The clinical scenario described is not typical of any of the other options given:

Erythema multiforme is described usually as multiple target lesions

Erythema nodosum as raised red papules on the shins

Lichen planus often associated with changes within the buccal mucosa, and

Psoriasis associated with scaling lesions.



[Q: 2305] OnExamination 2012 - Endocrinology

A 39-year-old woman presents with pain and tenderness over the anterior neck, agitation and palpitations. She has also had flu-like symptoms and generalised aches and pains over the past few weeks.

On examination her BP is 135/72 mmHg, her pulse is 90 and regular. She has a fine tremor and is tender over her thyroid.

Investigations show:

Haemoglobin 11.9 g/dl(11.5-16.0)

White cell count $9.8 \times 10^9/L$ (4-11)

Platelets $203 \times 10^9/L$ (150-400)

Sodium 137 mmol/l (135-146)

Potassium 3.9 mmol/l (3.5-5)

Creatinine 117 $\mu\text{mol/l}$ (79-118)

TSH <0.05 IU/l (0.5-4.5)

Thyroid radio-isotope scanuptake decreased

What is the most likely diagnosis?

- 1- Graves' disease
- 2- Struma ovarii
- 3- Sub-acute thyroiditis
- 4- Thyrotoxicosis factitia
- 5- Toxic multinodular goitre

Answer & Comments

Answer: 3- Sub-acute thyroiditis

Graves' disease and toxic multinodular goitre are associated with increased radio-isotope uptake, diffuse in the case of Graves' and within the multiple nodules in the case of toxic goitre.

Thyrotoxicosis factitia and struma ovarii are associated with reduced radio-isotope uptake, but those diagnoses do not fit with the clinical picture seen here.



[Q: 2306] OnExamination 2012 - Endocrinology

A 48-year-old man with a history of obesity and alcoholism comes to the endocrine clinic for assessment.

He has difficulties with hypertension for which he currently takes three agents, and diabetes which is currently managed with metformin monotherapy. On examination his BP is 160/94 mmHg. His pulse is 75 and regular.

Investigations show:

Haemoglobin 13.5 g/dl (13.5-17.7)

White cell count $8.2 \times 10^9/L$ (4-11)

Platelets $184 \times 10^9/L$ (150-400)

Sodium 137 mmol/l (135-146)

Potassium 4.8 mmol/l (3.5-5)

Creatinine 132 micromol/l (79-118)

Cortisol post low dose dexamethasone 30 nmol/l

Which of the following is the most likely diagnosis?

- 1- Conn's syndrome
- 2- Cortisol producing adrenal adenoma
- 3- Ectopic ACTH production
- 4- Pituitary adenoma
- 5- Pseudo Cushing's

Answer & Comments

Answer: 5- Pseudo Cushing's

The lower limit of detectability for cortisol is 28 nmol/l. As such a result of 30 after low dose dexamethasone suppression test is consistent with a euadrenal state.

Before the development of more effective assays, the upper limit of normal was said to be 140 nmol/l, although around 10% of patients with Cushing's have cortisol below 140.

This patient does not fit the Conn's phenotype, and the potassium of 4.8 is also high for a patient with aldosterone excess.

Given the cortisol is only just above the lower limit of detectability, all of the options for Cushing's are incorrect.



[Q: 2307] OnExamination 2012 - Endocrinology

A 16-year-old girl presents to the clinic with her mother. They are concerned as she has not yet started her periods. You take an extended history and examine her.

Which of the following would suggest delayed puberty?

- 1- Absent mood swings
- 2- Absent pubic hair by age 13
- 3- Breast development only occurring at the age of 13
- 4- Failure to begin periods by age 16
- 5- Shorter than expected height compared to her parents

Answer & Comments

Answer: 4- Failure to begin periods by age 16

Recognised signs of delayed puberty in girls include:

Absence of breast development by age 14 years

Pubic hair absent by age 14

More than five years between the start and completion of breast growth

Menarche has not occurred by age 16.

Recognised signs of delayed puberty in boys include:

No testicular enlargement by age 14 years

Pubic hair absent by age 15

More than five years between the start and completion of growth of the genitalia.



[Q: 2308] OnExamination 2012 - Endocrinology

A 33-year-old woman is currently treated with carbimazole and thyroxine in a block replace regimen for Graves' disease, and she is thinking about a decision with respect to radioiodine therapy.

Her thyroid function has been stable over the past few months and her most recent TSH is measured at 2.5 mU/l. She is concerned however that her eyes are more itchy and swollen and that she needs treatment from the ophthalmologist.

Which of the following would prompt urgent referral with respect to her thyroid eye disease?

- 1- Change in the intensity or quality of colour vision
- 2- Increased itchiness of both eyes
- 3- Intermittent diplopia
- 4- Increased light sensitivity
- 5- Orbital ache

Answer & Comments

Answer: 1- Change in the intensity or quality of colour vision

Thyroid eye disease occurs in between 25 and 50% of patients with Graves' disease.

Impaired perception of colour implies acute progressive neuropathy and as such is a consideration for urgent ophthalmological referral.

Other indications for urgent referral include

Sudden deterioration in visual acuity

Globe subluxation

Swelling of the optic disc

Corneal opacity and

An inability for the eyelids to sufficiently cover the cornea.

High dose corticosteroids are the mainstay of initial therapy for thyroid eye disease.

The role of radiotherapy remains controversial, with surgical decompression preferred by many ophthalmologists.

A. Is the correct answer, as it is an indication of acute progressive neuropathy.

B. Is incorrect because increased itchiness is a common feature of thyroid eye disease, a failure to respond to topical steroids may prompt referral.

C. Intermittent diplopia is incorrect because it is only progressive or worsening diplopia that should prompt referral.

D. Increased light sensitivity is incorrect because progressively worsening light sensitivity over one to two months prompts referral.

E. Orbital ache is incorrect because this is a common feature of thyroid eye disease, particularly in the mornings.



[Q: 2309] OnExamination 2012 - Endocrinology

A 29-year-old woman is admitted for investigation of recurrent collapses.

She says that she feels butterflies in her stomach and very faint prior to when she

collapses. On some occasions these events have been aborted by eating food. She also says that she has put on 6 kg in weight over the past few months.

On examination her BMI is 29 kg/m². Her BP is 125/75 mmHg, her pulse is 75. Physical examination is unremarkable.

Investigations show

Haemoglobin 12.4 g/dl(11.5-16.5)

White cell count 6.2 x 10⁹/L (4-11)

Platelets 280 x 10⁹/L (150-400)

Serum Sodium 143 mmol/l (135-146)

Serum Potassium 4.0 mmol/l (3.5-5)

Creatinine 90 µmol/l (79-118)

Fasting glucose 4.5 mmol/l (4.5-5.6)

Which of the following is the next most appropriate investigation?

- 1- 72 hour supervised fast
- 2- CT abdomen
- 3- Pancreatic USS
- 4- Proinsulin measurement
- 5- Urine sulphonylurea assay

Answer & Comments

Answer: 1- 72 hour supervised fast

This patient's history is suggestive of recurrent hypoglycaemia, but bloods taken in between attacks are entirely normal. Among the causes of recurrent hypoglycaemic episodes in seemingly healthy patients, discriminating between sulphonylurea-induced hypoglycaemia and insulinoma is extremely important due to the different management strategies. Inappropriately high serum levels of insulin and C-peptide during episodes are characteristic features of both conditions. In contrast, hypoglycaemia caused by exogenous insulin is associated with low serum C-peptide. The history of weight gain which this patient reports is supportive of increased appetite in response to hyperinsulinaemia. In

the exam you would expect the question to include a family or personal history of diabetes mellitus, or for the patient to have an occupation which allows them access to hypoglycaemics, to lead you to a diagnosis of inappropriate use of sulphonylureas.

The diagnosis of insulinoma can be difficult, as tumours can be small and may only secrete insulin episodically.

In this case the optimal investigation would be a prolonged fast, up to 72 hours, followed if necessary, by a period of supervised exercise. In the vast majority of cases this is enough to precipitate release of insulin from an insulinoma. During any period of hypoglycaemia, you should measure insulin, glucose, sulphonylureas, C-peptide, proinsulin and beta-hydroxybutyrate.

Determination of sulphonylureas in serum or urine is possible with liquid chromatography, and should be sent at the time of an episode to exclude this diagnosis. A negative sample at a time of normoglycaemia does not assist with the diagnosis, and therefore is not indicated as a first line investigation in this case where insulinoma should be suspected. Some laboratories will decline to process a sample if it was taken during a period of normoglycaemia. It should however be done if the patient suffers an episode of hypoglycaemia whilst in hospital.

No imaging technique has been shown to be sufficiently sensitive to localise insulinomas, and therefore is not the investigation of choice here.

Proinsulin is the precursor of insulin and C-peptide. Only 1-3% is secreted intact, but it has a longer half-life than insulin and can bind to the insulin receptor. Levels are elevated in insulinomas, which is most marked in the fasting state.

As an aside, in children and younger adults, the differential diagnosis of hypoglycaemia is

broader and includes a number of inherited metabolic defects.



[Q: 2310] OnExamination 2012 - Endocrinology

A 17-year-old boy has learning difficulties and is seen in the genetics clinic as his maternal uncles also had learning difficulties. Examination reveals that the patient has large ears and large testes.

What is the most likely genetic diagnosis?

- 1- 47 XYY
- 2- Acromegaly
- 3- Fragile X syndrome
- 4- Klinefelter's syndrome
- 5- Mosaic Down's syndrome

Answer & Comments

Answer: 3- Fragile X syndrome

In addition to moderate to severe mental retardation, other characteristics of individuals with fragile X syndrome may include:

- Large ears
- Macro-orchidism
- Prognathism
- Speech delays
- Prominent forehead
- Double-jointedness
- Autistic symptoms
- Occasional self-mutilation.

The face is typically long and narrow, with a high arched palate and large ears. Otitis media, strabismus, and dental problems may be present.

Other common characteristics include:

Hyperextensible joints

Hypotonia

Heart problems including mitral valve prolapse.

In males, abnormally large testes are a distinctive feature.

In young children:

Delayed motor development

Hyperactivity

Behavioural problems

Toe walking

Occasional seizures

can occur.



[Q: 2311] OnExamination 2012 - Endocrinology

A 25-year-old woman is admitted on the medical intake.

She is 10 weeks post partum and has been generally unwell for two weeks with malaise sweats and anxiety.

On examination she is haemodynamically stable, and clinically euthyroid.

TFTs show the following:

Free T₄ 33 pmol/L(9-23)

Free T₃ 8 nmol/L(3.5-6)

TSH <0.02 mU/L(0.5-5)

What is the appropriate management?

- 1- Carbimazole 40 mg/day
- 2- Lugol's iodine
- 3- Propranolol 20 mg tds
- 4- Propylthiouracil 50 mg/tds
- 5- Radioactive iodine therapy

Answer & Comments

Answer: 3- Propranolol 20 mg tds

The diagnosis here is likely to be post partum thyroiditis which tends to occur within the three months of delivery followed by a hypothyroid phase at three to six months, followed by spontaneous recovery in one third of cases. In the remaining two-thirds, a single-phase pattern or the reverse occurs.

Management is centred on symptomatic treatment using β -blockers for relief of tremor or anxiety, and observation for the development of persistent hypo- or hyperthyroidism.

Graves' disease is a less likely diagnosis based on the proximity to delivery and the absence of any other signs to suggest Graves' ophthalmopathy, goitre and bruit.

Hashitoxicosis is a possibility but is less likely than Graves'.



[Q: 2312] OnExamination 2012 - Endocrinology

A 26-year-old male body builder is referred to the clinic by his GP. He and his wife have been trying to conceive for three years. The GP found him to be azoospermic.

An MRI of the pituitary demonstrates no abnormality.

The results of his initial investigations are shown below:

TSH 3.7 pmol/l (0.5-5.0)

T₄ 11.1 pmol/l (12.5-25.0)

IGF- 116.1 nmol/l (9-36)

LH <1.0 IU/l (3.6-17.1)

FSH <1.0 IU/l (2.25-20)

Testosterone 16.0 nmol/l (9-34.7)

What is the likely diagnosis?

- 1- Anabolic steroid use
- 2- Androgen insensitivity syndrome
- 3- Kallman's syndrome
- 4- Non-functioning pituitary adenoma

5- Testicular teratoma

Answer & Comments

Answer: 1- Anabolic steroid use

The most likely diagnosis is steroid-induced hypogonadism. Body builders may be involved in the illicit use of anabolic and androgenic steroids. These results are consistent with ongoing use of androgens. The hypogonadism if persistent may be treated with human chorionic gonadotropin.

In the event of a non-functioning pituitary tumour the testosterone would be low together with the luteinising hormone (LH) and follicle-stimulating hormone (FSH) and an MRI of the pituitary would not miss this diagnosis. The growth hormone axis would also be likely to be suppressed, and a low IGF-1 would result.

In the event of androgen insensitivity the patient may appear phenotypically female.

One would expect a low testosterone in isolated gonadotrophin deficiency.

Kallman's syndrome results in hypogonadotrophic hypogonadism.

A teratoma is unlikely to cause hypogonadotrophic hypogonadism.



[Q: 2313] OnExamination 2012 - Endocrinology

Which of the following statements regarding individuals with porphobilinogen (PBG) deaminase deficiency is correct?

- 1- Excrete faecal PBG between acute attacks
- 2- Experience significant photosensitivity
- 3- Have a greater than 75% chance of remaining asymptomatic throughout their lives
- 4- Have markedly increased faecal protoporphyrin excretion during attacks

5- When manifesting clinical disease generally present within the first decade of life

Answer & Comments

Answer: 3- Have a greater than 75% chance of remaining asymptomatic throughout their lives

Porphobilinogen (PBG) deaminase deficiency is the basis of acute intermittent porphyria (AIP).

Photosensitivity is unusual in AIP and patients excrete urinary PBG between and during acute attacks.

Faecal porphyrin excretion is usually normal or slightly increased.

Clinical disease is manifested more frequently in females, and only rarely presents before puberty: 90% of affected individuals remain asymptomatic throughout their lives.



[Q: 2314] OnExamination 2012 - Endocrinology

A 45-year-old obese male with a two year history of type 2 diabetes has recently commenced metformin at a dose of 500 mg twice daily.

However, he re-attends clinic and reports numerous gastrointestinal side effects including bloating and flatulence. He is keen to stop metformin and commence an alternative agent.

Which of the following drugs is the most appropriate choice?

- 1- Acarbose
- 2- Exenatide
- 3- Insulin
- 4- Pioglitazone
- 5- Repaglinide

Answer & Comments

Answer: 4- Pioglitazone

Treatment options for type 2 diabetes are complex.

Metformin is indicated in patients who are overweight or obese, whose blood glucose is inadequately controlled with lifestyle interventions. It can also be first-line in patients who are not overweight. If blood glucose control remains inadequate another oral hypoglycaemia should be added, usually an sulphonylurea. Gradual increases in the dose of metformin reduces the risk of side effects, and modified release preparations reduce the risk further. The dose should be reviewed if the creatinine excess 130mmol/L or the eGFR is below 45, and stopped with a creatinine over 150mmol/L or eGFR below 30.

Sulphonylureas can be used as first-line if the patient is not overweight, metformin is contraindicated or not tolerated, or a rapid response to therapy is required. Patients should be warned of the risk of hypoglycaemia.

Thiazolidinediones are used in patients who have inadequate glycaemic control with a combination of metformin and sulphonylurea, in whom there are concerns regarding insulin therapy (e.g. where there is likely to be significant insulin resistance). They can be associated with significant oedema and weight gain, and should not be used in those with heart failure or those at high risk of fracture. This class of drugs interacts with PPAR γ receptors and can significantly reduce insulin resistance. They can be used in combination with sulphonylureas for patients who are intolerant of metformin.

Acarbose is only indicated in those patients unable to use other oral glucose-lowering medications.

Exenatide can be used just prior to insulin in patients with a BMI of over 35.

Repaglinide is an insulin secretagogue, which can be used if other classes of treatment fail.

Insulin is typically only started in patients who have failed an adequate trial of oral glucose-lowering treatments.



[Q: 2315] OnExamination 2012 - Endocrinology

A 26-year-old man presented with polydipsia and polyuria for the last two years.

Investigations reveal:

Serum Urea 8.4 mmol/L (2.5-7.5)

Serum Creatinine 108 mol/L (60-110)

Serum corrected Calcium 2.82 mmol/L (2.2-2.6)

Serum phosphate 0.73 mmol/L (0.8-1.4)

Plasma parathyroid hormone 6.8 pmol/L (0.9-5.4)

Which of the following is directly responsible for his increased intestinal calcium reabsorption?

- 1- 1,25 Dihydroxy vitamin D
- 2- 25 Hydroxy vitamin D
- 3- Calcitonin
- 4- Hypophosphataemia
- 5- Parathyroid hormone

Answer & Comments

Answer: 1- 1,25 Dihydroxy vitamin D

This patient has hypercalcaemia due to hyperparathyroidism.

However, the intestinal absorption of calcium is facilitated by 1,25 dihydroxy-vitamin D, which stimulates the microvillous membrane of the enterocyte to synthesise the calcium-binding carrier protein necessary for active calcium ion absorption .



[Q: 2316] OnExamination 2012 - Endocrinology

A 26-year-old man presented with polydipsia and polyuria for the last two years.

Investigations showed:

Serum Urea 8.4 mmol/L(2.5-7.5)

Serum Creatinine 108 µmol/L(60-110)

Serum corrected Calcium 2.82 mmol/L(2.2-2.6)

Serum phosphate 0.73 mmol/L(0.8-1.4)

Plasma parathyroid hormone 6.8 pmol/L(0.9-5.4)

Which of the following mechanisms is responsible for the hypophosphataemia observed?

- 1- Increased deposition of calcium phosphate crystals in soft tissues
- 2- Increased gastrointestinal secretion of phosphates
- 3- Increased renal tubular secretion of phosphates
- 4- Reduced gastrointestinal absorption of phosphates
- 5- Reduced renal tubular reabsorption of phosphates

Answer & Comments

Answer: 5- Reduced renal tubular reabsorption of phosphates

This patient has mild hypercalcaemia, elevated PTH and low phosphate indicating primary hyperparathyroidism.

The hypophosphataemia is due to the reduced renal reabsorption of phosphate.



[Q: 2317] OnExamination 2012 - Endocrinology

Which of the following is a metabolic effect of exenatide?

- 1- Accelerates gastric emptying

- 2- Improves insulin sensitivity
- 3- Inhibits insulin release
- 4- Promotes gluconeogenesis by the liver
- 5- Suppresses appetite

Answer & Comments

Answer: 5- Suppresses appetite

Exenatide mimics the effect of the gut hormone GLP-1 (glucagon-like peptide 1) and has favourable effects on the metabolism of individuals with diabetes mellitus.

Exenatide suppresses appetite, inhibits glucose production in the liver, slows gastric emptying and stimulates insulin release. It does not increase insulin sensitivity which is achieved by drugs such as metformin and the glitazones.

In summary exenatide has the following metabolic effects

Stimulates insulin release

Inhibits glucose production by the liver

Slows gastric emptying

Suppresses appetite.



[Q: 2318] OnExamination 2012 - Endocrinology

A 65-year-old male undergoes a CT headscan after falling from a ladder and knocking himself out.

The CT report reveals that he has a 1.3 cm macroadenoma which does not encroach upon the optic chiasm. On recovery he is perfectly well and examination is entirely normal, including full visual fields to confrontation.

Investigations reveal normal thyroid function, testosterone concentration and short Synacthen test results. His prolactin concentration is 550 mU/L (50-450).

What is the most appropriate treatment for this patient?

- 1- Advise trans-sphenoidal hypophysectomy
- 2- Arrange pituitary radiotherapy
- 3- Arrange serial imaging
- 4- No further investigation/treatment required
- 5- Treat with cabergoline

Answer & Comments

Answer: 3- Arrange serial imaging

This man has a co-incidentally detected pituitary macroadenoma.

The small elevation in prolactin probably reflects stalk compression and does not indicate that this is a prolactinoma. In macroprolactinomas, the prolactin concentration is greater than 2000 mU/L.

In this man's case, with no visual field defects and the tumour being distant from the chiasm, the most appropriate treatment would be observation with serial scanning to assess for any change in size that would then merit surgical intervention.

However, this man who is eupituitary may never encounter any growth in this co-incidentally detected non-functional pituitary tumour.



[Q: 2319] OnExamination 2012 - Endocrinology

A 17-year-old female attends clinic complaining of hirsutism and oligomenorrhoea.

Which of the following would be most suggestive of a diagnosis of polycystic ovarian syndrome (PCOs)?

- 1- Increased androstenedione concentration
- 2- Increased FSH concentration
- 3- Increased insulin concentration

- 4- Increased prolactin concentration
- 5- Increased sex hormone binding globulin (SHBG) concentration

Answer & Comments

Answer: 1- Increased androstenedione concentration

PCOs is associated with a raised luteinising hormone:follicle-stimulating hormone (LH:FSH) ratio, with insulin resistance and hyperandrogenism as evidenced by raised androstenedione and slightly raised testosterone.

Elevated prolactin concentrations although a feature of PCOs are not specific of the diagnosis and may suggest microprolactinoma.

Although insulin resistance is a feature of PCOs, a raised insulin concentration is rather irrelevant and no one would measure this in clinical practice. It is often elevated in association with testosterone secreting tumours.



[Q: 2320] OnExamination 2012 - Endocrinology

A 17-year-old girl complains of feeling tired and lethargic for the last six months. She also has generalised abdominal discomfort and constipation. She denies depression but her performance at school has deteriorated this year.

Examination shows a pale and thin young woman. Her blood pressure is 110/60 mmHg.

Hb 13.4 g/l (11.5-16.5)

WBC $4.8 \times 10^9/L$ (4-11)

Platelet $290 \times 10^9/L$ (150-400)

ESR 37mm/hr(0-20)

Na 131mM(135-144)

K 2.7mM(3.4-4.5)

Urea 3.0mM(3-7)

Creat 90mM(50 - 100)

Bicarbonate 35mM(20-28)

Alkaline phosphatase 90iu/l (50-110)

Bilirubin 12(0-17)

AST 30 iu/l (5-40)

Albumin 36g/l (33-44)

CXR normal

Which of the following is the most likely underlying diagnosis?

- 1- Addison's disease
- 2- Anorexia nervosa
- 3- Conn's syndrome
- 4- Cushing's syndrome
- 5- Pheochromocytoma

Answer & Comments

Answer: 2- Anorexia nervosa

This patient has anorexia nervosa with self-induced vomiting, which would explain the low Na, K and alkalosis.

Addison's disease causes hyponatraemia and hyperkalaemic acidosis, whilst Cushing's disease causes hypokalaemic alkalosis. The clinical presentation does not fit with the latter.

Conn's syndrome (adrenal adenoma) is associated with hypertension and hypokalaemia.



[Q: 2321] OnExamination 2012 - Endocrinology

In the treatment of osteoporosis, which of the following best describes the drug raloxifene?

- 1- A bisphosphonate
- 2- A calcium receptor modulator
- 3- A PTH receptor agonist
- 4- A selective oestrogen receptor modulator
- 5- An oestrogen

Answer & Comments

Answer: 4- A selective oestrogen receptor modulator

Raloxifene is the first of the so-called selective oestrogen receptor modulators.

There are fundamentally two types of oestrogen receptor, alpha and beta, distributed at locations such as breast, uterus, bone and in the vasculature.

Raloxifene acts as an oestrogen agonist at some sites, for example, bone to increase mineralisation, but acts as an antagonist at other sites, for example, uterus/breast (preventing endometrial/breast hyperplasia).



[Q: 2322] OnExamination 2012 - Endocrinology

A 48-year-old man presented to his general practitioner with a two year history of generalised headaches.

He had also noticed a recent increase in his shoe size. He denied any visual symptoms. He has no significant past medical history of note and is not on any regular medications.

On examination, he had coarse facial features with prognathism. His visual fields were full to confrontation.

Investigations showed:

Insulin-like growth factor - 143 nmol/L(5.6-23.3)

Plasma prolactin 868 mU/L(<360)

MRI scan suggests a pituitary adenoma measuring 8 mm without any extrasellar extension.

What is the most appropriate treatment for this man?

- 1- Bromocriptine
- 2- Cabergoline
- 3- Octreotide
- 4- Pegvisomant

5- Pituitary surgery

Answer & Comments

Answer: 5- Pituitary surgery

Surgery is the most appropriate primary management for acromegaly as demonstrated clinically and supported by the biochemistry in this case.



[Q: 2323] OnExamination 2012 - Endocrinology

A 75-year-old man is admitted with a blood sugar of 40 mmol/l and lobar pneumonia and dies despite treatment.

Post-mortem examination reports the presence of amyloid polypeptide on pancreatic histology.

Which of the following would be suggested by this?

- 1- That he has chronic pancreatitis as a cause of diabetes
- 2- That he has diabetes secondary to amyloidosis
- 3- That he has type 1 diabetes
- 4- That he has type 2 diabetes
- 5- This can be a non-specific finding

Answer & Comments

Answer: 4- That he has type 2 diabetes

The presence of amyloid polypeptide on pancreatic histology is highly suggestive of type 2 diabetes.

Although the primary defect in type 2 diabetes is insulin resistance, loss of insulin secretory function over time does occur in patients with type 2 diabetes and reduction in beta cell mass due to amyloid deposition may partly account for this.



[Q: 2324] OnExamination 2012 -

Endocrinology

You are asked to review a 72-year-old man with chronic lung disease on the respiratory ward. He was admitted a few days earlier with left lower lobe pneumonia but remains confused.

On examination his temperature is 37.2°C, BP is 148/72 mmHg, and pulse is 80 and regular. He does not look fluid overloaded and has some residual signs at his left base.

Investigations show:

Haemoglobin 13.1 g/dl (13.5-17.7)

White cell count $12.3 \times 10^9/L$ (4-11)

Platelets $208 \times 10^9/L$ (150-400)

Sodium 122 mmol/l (135-146)

Potassium 4.1 mmol/l (3.5-5)

Creatinine 120 $\mu\text{mol/l}$ (79-118)

The nurses have tried fluid restricting him but his sodium remains stubbornly low.

Which of the following is the management of choice?

- 1- Further fluid restriction
- 2- Intranasal vasopressin
- 3- IV 1.8% sodium chloride
- 4- Oral demeclocycline
- 5- Oral furosemide

Answer & Comments

Answer: 4- Oral demeclocycline

Given that fluid restriction has failed already and the patient is still confused, further fluid restriction seems inappropriate.

Vasopressin is a treatment for diabetes insipidus, and 1.8% saline can be used in an emergency situation as a treatment for syndrome of inappropriate secretion of antidiuretic hormone (SIADH).

Lithium induces nephrogenic DI but is not an appropriate therapy for SIADH.



[Q: 2325] OnExamination 2012 - Endocrinology

A 25-year-old woman comes to the GP surgery a few weeks after the birth of her first child. Unfortunately she suffered a postpartum haemorrhage and required a three unit blood transfusion.

Over the past few weeks she has been feeling increasingly tired but puts this down to post pregnancy blues. She tells you that she seems to be losing her hair.

On examination her BP is 100/60 mmHg, pulse is 62 and regular.

Investigations show:

Haemoglobin 10.5 g/dl (11.5-16.0)

White cell count $7.3 \times 10^9/L$ (4-11)

Platelets $207 \times 10^9/L$ (150-400)

Sodium 130 mmol/l (135-146)

Potassium 5.1 mmol/l (3.5-5)

Creatinine 122 $\mu\text{mol/l}$ (79-118)

TSH 0.3 IU/l (0.5-4.5)

Which of the following is the most likely diagnosis?

- 1- Addison's disease
- 2- Graves' disease
- 3- Hashimoto's thyroiditis
- 4- Post-partum thyroiditis
- 5- Sheehan's syndrome

Answer & Comments

Answer: 5- Sheehan's syndrome

We are given the low thyroid-stimulating hormone (TSH) as well as electrolyte disturbance, showing that this is panhypopituitarism leading to adrenal insufficiency, rather than Addison's.

Graves' is associated with thyrotoxicosis, and we have no evidence of that here apart from the low TSH, which is in fact consistent with

pituitary failure rather than elevated thyroxine leading to negative feedback on TSH production.

Hashimoto's and postpartum thyroiditis would not be associated with the electrolyte disturbance seen here.



[Q: 2326] OnExamination 2012 - Endocrinology

A 49-year-old man is referred to the endocrinology clinic for review because he has noticed changes in his facial appearance. He also suffers from hypertension and has problems with excessive sweating.

On examination his BP is 156/95 mmHg. You notice that he has prognathism and acne.

Which of the following initial screening tests is most reasonable for acromegaly?

- 1- Growth hormone
- 2- IGF-1
- 3- Insulin suppression test
- 4- MRI pituitary
- 5- Visual field testing

Answer & Comments

Answer: 2- IGF-1

Growth hormone is incorrect because release of growth hormone is pulsatile, as such according to the time of day when it is measured the chances of a false negative result may be increased.

Glucose tolerance test rather than insulin tolerance testing is used for diagnosis of acromegaly, with failure to suppress growth hormone levels indicating a positive result.

MRI pituitary and visual field testing are clearly not initial tests, but part of pre-operative work up.



[Q: 2327] OnExamination 2012 - Endocrinology

You are asked to see a 62-year-old woman on the surgical ward a few hours after she has undergone a thyroidectomy. The nurses are concerned because she tells them she feels unwell.

Which of the following symptoms would be most consistent with hypocalcaemia as a result of inadvertent parathyroidectomy?

- 1- Hyperventilation
- 2- Nausea
- 3- Paraesthesia
- 4- Polyuria
- 5- Thirst

Answer & Comments

Answer: 3- Paraesthesia

Symptoms of hypocalcaemia include

Paraesthesia (usually fingers, toes and around mouth)

Tetany

Carpopedal spasm (wrist flexion and fingers drawn together)

Muscle cramps.

With worsening hypocalcaemia,

Long QT

Bronchospasm

Laryngospasm and

Seizures

are all possible.

Nausea, polyuria and thirst are all possible symptoms associated with hypercalcaemia.

Whilst hyperventilation may result in a reduction in ionised calcium, and hence paraesthesia, it is not per se a cause of low calcium levels.



[Q: 2328] OnExamination 2012 -
Endocrinology

A 64-year-old man comes to the clinic for review of his type 2 diabetes. He is currently managed with metformin 1 g BD and sitagliptin 100 mg.

On examination his blood pressure is 156/90 mmHg, his pulse is 80 and his BMI is 30. Of note on routine investigations is a raised triglyceride level of 3.1 mmol/l (0.7-2.1).

Which of the following is associated with elevated triglycerides?

- 1- Decreased hepatic fat
- 2- Increased insulin resistance
- 3- Increased subcutaneous fat
- 4- Reduced cardiovascular risk
- 5- Reduced insulin requirements

Answer & Comments

Answer: 2- Increased insulin resistance

The answer is option B, increased insulin resistance.

Elevated triglycerides are associated with disordered energy handling by adipocytes. This is not only manifest by raised lipid levels, but also by an inability of cells to take up glucose properly, leading to increased insulin resistance. This leads to increased insulin requirements.

This increased insulin resistance is associated with a constellation of other cardiovascular risk factors including hypertension, hypercoagulability, and low HDL cholesterol.

Hepatic fat content is a determinant of postprandial triglyceride levels in type 2 diabetes, and increased hepatic fat is associated with elevated triglyceride levels.

A statement by the American Heart Association in 2011 showed that subcutaneous fat may serve as a protective factor with regard to the metabolic

consequences of obesity, and a relative paucity (ie, lipodystrophy) is associated with hypertriglyceridemia.



[Q: 2329] OnExamination 2012 -
Endocrinology

A 62-year-old man comes to the clinic for review of his diabetes.

Current medication includes metformin 1 g BD and 40 units BD mixed insulin. Other medication includes candesartan 16 mg and amlodipine 10 mg.

On examination his BP is 155/84 mmHg, his pulse is 70 and regular. His BMI is 31.

Investigations show:

Haemoglobin 12.0 g/dl(13.5-17.7)

White cells $7.8 \times 10^9/L$ (4-11)

Platelet $192 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (135-146)

Potassium 5.1 mmol/l (3.5-5)

Creatinine 127 micromol/l (79-118)

Alanine aminotransferase 110 U/l (5-40)

Alkaline phosphatase 94 U/l (39-117)

HDL cholesterol 0.7 mmol/l (0.8-1.8)

LDL cholesterol 2.4 mmol/l (<4.0)

Triglycerides 3.2 mmol/l (0.7-2.1)

Which of the following conditions is associated with this clinical picture?

- 1- Acute pancreatitis
- 2- Autoimmune hepatitis
- 3- Chronic pancreatitis
- 4- Non-alcoholic steatohepatitis (NASH)
- 5- Unpredictable hypoglycaemia

Answer & Comments

Answer: 4- Non-alcoholic steatohepatitis (NASH)

NASH - hypertriglyceridaemia and raised transaminases are suggestive of increased hepatic fat. Over time it is thought that around 10% of patients who have non-alcoholic steatosis progress to chronic inflammation and NASH.

A proportion of these may go on to develop cirrhosis and end stage liver disease, and a smaller proportion of these go on to get hepatocellular carcinoma.

Key to the management of NASH is weight loss, which is associated with a reduction in lipid overflow.

NB - candesartan can also cause elevated liver enzymes.



[Q: 2330] OnExamination 2012 - Endocrinology

A 51-year-old woman presents to the clinic complaining of thirst and lethargy. She has noticed her symptoms increasing over the past few months and is worried that she may be suffering from diabetes mellitus.

On examination her BP is 122/72 mmHg, her pulse is 72 and regular, her BMI is 21. General physical examination is unremarkable.

Investigations show

Haemoglobin 12.5 g/dl(11.5-16.5)

White cells $8.8 \times 10^9/L$ (4-11)

Platelets $193 \times 10^9/L$ (150-400)

Sodium 141 mmol/l (135-146)

Potassium 4.8 mmol/l (3.5-5)

Creatinine 88 $\mu\text{mol/l}$ (79-118)

Calcium 2.81 mmol/l (2.20-2.67)

Phosphate 0.7 mmol/l (0.8-1.5)

Glucose 5.1 mmol/l (<7.0)

Which of the following is the most likely diagnosis?

- 1- Familial hypercalcaemic hypocalciuria
- 2- Hypercalcaemia of malignancy

3- Primary hyperparathyroidism

4- Secondary hyperparathyroidism

5- Tertiary hyperparathyroidism

Answer & Comments

Answer: 3- Primary hyperparathyroidism

The most likely diagnosis is primary hyperparathyroidism.

She has only mildly elevated serum calcium, and given that her phosphate is low and there is no evidence of renal impairment, primary hyperparathyroidism is the most likely diagnosis.

Familial hypercalcaemic hypocalciuria may present with a similar blood picture, but is very rare. Parathyroid hormone (PTH) is likely to be normal or elevated.

Management of the condition depends on

The degree of calcium elevation

Symptoms

Bone mineral density.



[Q: 2331] OnExamination 2012 - Endocrinology

A 45-year-old woman comes to the clinic complaining of tiredness and requests a general check up.

She has found it difficult to maintain a stable weight over the past couple of years, and has only achieved this by quite severe dieting. On examination her BP is 145/72 mmHg, her pulse is 62, and her BMI is 27 kg/m².

Investigations show

Haemoglobin 13.1 g/dl(11.5-16.5)

White cell count $7.8 \times 10^9/L$ (4-11)

Platelets $203 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 4.2 mmol/l (3.5-5)

Creatinine 110 $\mu\text{mol/l}$ (79-118)

TSH 11.1 mU/l (0.5-5.0)

Free thyroxine 10.2 pmol/l (10-25)

LDL cholesterol 4.3 mmol/l (<4.0)

Triglycerides 3.1 mmol/l (0.5-1.7)

Which of the following is the most appropriate treatment?

- 1- Atorvastatin 10 mg
- 2- No therapy
- 3- Simvastatin 10 mg
- 4- Thyroxine 50 mcg
- 5- Thyroxine 100 mcg

Answer & Comments

Answer: 4- Thyroxine 50 mcg

This patient has subclinical hypothyroidism, and given that her TSH is more than 10, she has a risk of progression to clinical hypothyroidism of up to 20% per year. Her lipid abnormalities are also significant, and driven by the lack of T4; as such, low dose thyroxine is a better treatment than starting statin therapy.

Where the TSH is outside the normal range but less than 10, the risk of progression to clinical hypothyroidism is lower, and the lipid abnormalities are less marked.



[Q: 2332] OnExamination 2012 - Endocrinology

A 16-year-old female weighing 80 kg presents with a six month history of excessive weight gain and weakness.

On examination she had central obesity with abdominal striae, a blood pressure of 178/96 mmHg and proximal muscle weakness.

Urinalysis showed glucose ++.

What is the most appropriate initial investigation for this patient?

- 1- 1 mg overnight dexamethasone suppression test
- 2- 9 am plasma cortisol concentration
- 3- 24 hour urinary free cortisol concentration
- 4- ACTH concentration
- 5- A short Synacthen test

Answer & Comments

Answer: 3- 24 hour urinary free cortisol concentration

This patient is likely to have Cushing's syndrome.

It is a difficult choice between an overnight dexamethasone suppression test and the urine free cortisol estimation but on balance, the simplest test would be urine free cortisol assessment.

In the dexamethasone suppression test 25-30 micrograms/kg is used (maximum 2 mg), so the amount suggested in this question is too small.

9 am cortisol and adrenocorticotrophic hormone (ACTH) concentrations will not confirm the diagnosis.

A short Synacthen test is used to confirm hypoadrenalism.



[Q: 2333] OnExamination 2012 - Endocrinology

A 53-year-old female with surgically treated acromegaly is receiving treatment with octreotide therapy due to persistently elevated growth hormone concentrations following surgery.

What is the mechanism of action of octreotide?

- 1- Inhibition growth hormone receptor
- 2- Inhibition of dopamine D2 receptor
- 3- Inhibition of GHRH receptor
- 4- Inhibition of IGF-1 receptor

5- Stimulation of the somatostatin receptor

Answer & Comments

Answer: 5- Stimulation of the somatostatin receptor

Octreotide is a somatostatin analogue and directly inhibits growth hormone secretion through interaction with somatostatin receptors.

It is also used in the treatment of neuroendocrine tumours such as carcinoid tumours again through interaction with somatostatin receptors.



[Q: 2334] OnExamination 2012 - Endocrinology

A 72-year-old woman with a history of type 2 diabetes for the past eight years is currently managed with oral metformin and gliclazide. She had an inferior myocardial infarction some four years earlier.

On examination her BP is 142/83 mmHg, pulse is 67 and regular. Her chest is clear and there is no ankle swelling.

Which of the following findings on laboratory investigation or clinical examination would be most associated with increased cardiovascular risk?

- 1- HbA1c 7.4% (<5.5)
- 2- HDL cholesterol 2.3 mmol/l (1.0-2.3)
- 3- LDL cholesterol 2.4 mmol/l (<4.0)
- 4- Triglyceride 2.8 mmol/l (0.5-1.7)
- 5- Urate 0.4 mmol/l (0.18-0.42)

Answer & Comments

Answer: 4- Triglyceride 2.8 mmol/l (0.5-1.7)

The answer is triglyceride 2.8 mmol/l.

High triglycerides and low high-density lipoprotein (HDL) cholesterol are the commonest lipid abnormality seen in type 2

diabetes, and both are associated with increased cardiovascular risk.

In total, triglycerides above 1.7 are thought to be associated with a 30% increase in relative cardiovascular risk.

An HbA1c of 7.4% would not be considered to be a very excessive cardiovascular risk indicator in a 72-year-old patient with type 2 diabetes.

The ACCORD study suggested that targeting lower HbA1c in patients with long established diabetes may be associated with increased mortality, although this effect has not been seen in other studies.

Low-density lipoprotein (LDL) cholesterol of 2.4 is only just above target.



[Q: 2335] OnExamination 2012 - Endocrinology

A 17-year-old female with type 1 diabetes, who is known to be poorly compliant with treatment, is admitted with diabetic ketoacidosis.

The respiratory rate is 41 per minute and the blood pressure 85/66 mmHg. She is confused and lethargic. An arterial blood gas shows the pH to be 7.01, and the potassium is 4.9 mmol/l.

Which condition carries the highest risk of mortality to this patient?

- 1- Cerebral oedema
- 2- Cerebrovascular accident
- 3- Myocardial infarction
- 4- Seizure
- 5- Ventricular tachycardia

Answer & Comments

Answer: 1- Cerebral oedema

The risk of mortality in some reported series of diabetic ketoacidosis (DKA) is 5%.

The incidence of cerebral oedema in paediatric patients treated for DKA is approximately 1%. The risk of cerebral oedema is highest in paediatric and adolescent patients, and is rarer in adults.

The rate of fluid, sodium and insulin replacement seems not to be related to the development of cerebral oedema, and often its development may be idiosyncratic. Thus the warning signs of cerebral oedema - headache, lethargy, confusion, reduced conscious level, incontinence, papillary changes - must be considered in this patient group.

Ventricular tachycardia is a theoretical risk in the presence of hypokalaemia, which is not present at this stage.

Seizures may occur as a consequence of the underlying cerebral oedema.



[Q: 2336] OnExamination 2012 - Endocrinology

A 26-year-old woman was being treated in the outpatient clinic for autoimmune hypothyroidism.

She was taking 150 µg of thyroxine and 200 mg of amiodarone.

Investigations reveal:

Plasma prolactin 654 mU/L(<360)

Plasma Free T₄ 24 pmol/L(10-22)

Plasma Free T₃ 5.2 pmol/L(5-10)

Plasma thyroid-stimulating hormone 68 mU/L (0.4-5)

What is the most likely explanation for her high TSH levels?

- 1- Amiodarone effect
- 2- Hyperprolactinaemia
- 3- Poor compliance with medications
- 4- Thyroid hormone resistance
- 5- TSH producing pituitary adenoma

Answer & Comments

Answer: 3- Poor compliance with medications

This young woman has a slightly elevated thyroxine (T₄) and an elevated thyroid-stimulating hormone (TSH).

The most probable explanation is poor compliance. This also explains the slightly high prolactin concentration too; a consequence of reduced dopaminergic tone on the lactotrophs.

The typical scenario is that the patients take their medication in the days before the clinic.

The most likely explanation is that thyroid hormone isn't being absorbed or even taken, (the compliance argument). Given that amiodarone has no effect on thyroid hormone absorption, it can't be the answer here.



[Q: 2337] OnExamination 2012 - Endocrinology

A 16-year-old girl is diagnosed with Turner's syndrome.

Which of the following autoimmune conditions is most commonly associated with Turner's?

- 1- Addison's disease
- 2- Autoimmune hepatitis
- 3- Hashimoto's thyroiditis
- 4- Sjogren's syndrome
- 5- Vitamin B₁₂ deficiency

Answer & Comments

Answer: 3- Hashimoto's thyroiditis

Hypothyroidism is quite common occurring in up to 24% of patients with Turner's syndrome.

It is typically autoimmune in origin - Hashimoto's thyroiditis - though the exact explanation for its high prevalence is not known.



[Q: 2338] OnExamination 2012 -
Endocrinology

A 48-year-old female with a three year history of type 2 diabetes presents at annual review. Despite optimisation of her oral hypoglycaemic therapy she has gained approximately 5 kg in weight over the last year and her HbA1c has deteriorated.

She is also treated with ramipril, bendroflumethiazide, and amlodipine, but her blood pressure remains difficult to control with a recording of 172/102 mmHg.

On examination, she has developed abdominal striae, thin skin is noticeable with bruising and she also has a proximal weakness. A diagnosis of Cushing's syndrome is suspected.

What is the most appropriate investigation for this patient?

- 1- 9 am ACTH concentration
- 2- 9 am cortisol concentration
- 3- 24 hour urine free cortisol concentration
- 4- Adrenal CT
- 5- Chest x ray

Answer & Comments

Answer: 3- 24 hour urine free cortisol concentration

Appropriate screening tests for Cushing's syndrome include a 1 mg overnight dexamethasone suppression test (1 mg dexamethasone given at 11 pm and the cortisol measured at 9 am the following morning).

A cortisol concentration less than 50 nmol/l after this test would be regarded as normal.

Another equally good and easy to perform test is a 24 hour urine collection measuring free cortisol in the urine. An elevated cortisol (usually above 250 nmol/day) suggests Cushing's syndrome.

Random cortisol or 9 am cortisol provides no diagnostic information whatsoever.

Chest x ray and adrenal CT are useful in investigating the possible cause of Cushing's syndrome.



[Q: 2339] OnExamination 2012 -
Endocrinology

In the treatment of congenital adrenal hyperplasia (CAH) which of the following statements is correct?

- 1- Efficacy of treatment is best monitored by 17-OH progesterone and androstenedione levels
- 2- Hydrocortisone may be administered once daily
- 3- Hypotension, hyperkalaemia and hyperreninaemia suggest that the dose of mineralocorticoid should be reduced
- 4- Preferred treatment in children is prednisone
- 5- Renin activity levels are of no clinical use in treatment monitoring

Answer & Comments

Answer: 1- Efficacy of treatment is best monitored by 17-OH progesterone and androstenedione levels

The treatment of CAH is the lowest dose of glucocorticoid that suppresses (not totally) adrenal androgens, whilst maintaining normal growth and weight gain. Renin activity levels can be used to monitor adequacy of mineralocorticoid and sodium replacement.

Hydrocortisone has a relatively short half life and must therefore be administered twice daily whilst the preferred mode of glucocorticoid replacement in children is hydrocortisone as it minimises growth suppression.

Over-treatment with mineralocorticoids leads to hypertension, suppressed plasma rennin activity and possibly growth retardation.



[Q: 2340] OnExamination 2012 - Endocrinology

A 55-year-old female complaining of vague tiredness is found to have a serum corrected calcium concentration of 2.9 mmol/l.

Examination was unremarkable.

Which of the following results confirms the suspected diagnosis of primary hyperparathyroidism?

- 1- High normal 1,25-dihydroxyvitamin D concentration
- 2- High normal 24 hour urinary calcium concentration
- 3- High normal plasma parathyroid hormone (PTH) concentration
- 4- Low normal plasma phosphate concentration
- 5- Low normal serum 25-hydroxyvitamin D concentration

Answer & Comments

Answer: 3- High normal plasma parathyroid hormone (PTH) concentration

A high or even normal PTH concentration in the presence of hypercalcaemia would support the diagnosis of hyperparathyroidism.

A high urinary calcium concentration may be expected as would a low plasma phosphate but neither confirm the diagnosis.

Elevated 1,25 vitamin D suggests a diagnosis of hypervitaminosis D.



[Q: 2341] OnExamination 2012 - Endocrinology

Which of the following compounds has a vasodilating effect?

- 1- Antidiuretic hormone (ADH)

2- Calcitonin gene related peptide

3- Endothelin

4- Renin

5- Somatostatin

Answer & Comments

Answer: 2- Calcitonin gene related peptide

ADH acts on the vasopressor receptors to cause vasoconstriction.

Endothelin is also a vasoconstrictor as is renin.

Somatostatin is also recognised to produce vasoconstriction of the splanchnic system.



[Q: 2342] OnExamination 2012 - Endocrinology

A 41-year-old woman presented asking for treatment to prevent osteoporosis. She was one year post-menopausal, is aware of flushes at night and has a family history of osteoporosis.

Which one of the following therapies would be most appropriate?

- 1- Calcium and vitamin D supplements
- 2- Continuous oestrogen
- 3- Cyclical etidronate and calcium
- 4- Cyclical oestrogen and progestogen
- 5- Vitamin D supplements

Answer & Comments

Answer: 4- Cyclical oestrogen and progestogen

This patient with a family history of osteoporosis is one year post-menopausal and has symptoms.

Calcium and vitamin D supplements with a good diet would be unnecessary and are unproven in this age group.

There is no suggestion that she has had a hysterectomy and so an unopposed oestrogen would be contra-indicated.

Etidronate is licensed for the prevention of further osteoporotic fractures, prophylaxis against corticosteroid induced osteoporosis and use when hormone replacement therapy (HRT) is contra-indicated.

In this patient's case, and in the absence of any specific contra-indications - thromboembolic disease, breast cancer - combined HRT would be the treatment of choice despite the recent literature indicating increased risk of vascular disease. One would use HRT in the symptomatic (menopausal symptoms) but not in the asymptomatic where possibly bisphosphonates would be preferred.



[Q: 2343] OnExamination 2012 - Endocrinology

A 33-year-old female presents with tiredness and lethargy.

Five years previously she had undergone a frontal surgery for a craniopharyngioma following presentation with amenorrhoea and headache. Post-operatively she developed seizures and was treated with sodium valproate.

She was demonstrated to be hypopituitary and receives hydrocortisone, thyroxine, oestrogen replacement therapy and desmopressin.

Which of the following investigations would you select to confirm a growth hormone deficiency (GHD)?

- 1- Clonidine test
- 2- GHRH/arginine test
- 3- IGF-1 concentration
- 4- Insulin tolerance test
- 5- L-dopa test

Answer & Comments

Answer: 2- GHRH/arginine test

This patient is more than likely to be GH deficient which would explain the lethargy but this requires confirmation before initiating treatment.

Although an insulin tolerance test is the gold standard for the diagnosis of GHD, it is contraindicated due to the epilepsy.

Therefore GHRH/arginine is regarded as a suitable alternative.



[Q: 2344] OnExamination 2012 - Endocrinology

A 72-year-old male presents with a two month history of weight loss and weakness.

Examination reveals a BMI of 24.5 kg/m² and a blood pressure of 146/90 mmHg.

Examination of the lower limbs reveals a bilateral weakness of knee extension. He is unable to rise from the squatting position. There is absence of the knee reflex but the ankle reflexes are preserved and both plantars are flexor. There are no abnormalities on sensory examination.

Which of the following tests may be diagnostic?

- 1- Oral glucose tolerance test
- 2- Thyroid function test
- 3- Urine free cortisol concentration
- 4- Vitamin B₁₂ concentration
- 5- Vitamin D concentration

Answer & Comments

Answer: 1- Oral glucose tolerance test

This patient presents with weight loss, and reduced quadriceps strength, bilaterally with absent knee reflexes. This is a typical presentation of diabetic amyotrophy.

Osteomalacia, hyperthyroidism and Cushing's would be unlikely as the proximal myopathy involves quadriceps and hamstrings and knee reflexes would be preserved.

Subacute combined degeneration of the cord does not present with such features.



[Q: 2345] OnExamination 2012 - Endocrinology

During routine investigation of a healthy couple for primary subfertility semen analysis reveals azoospermia.

On examination of the male there are no abnormalities on general examination and testicular examination shows a normal testicular volume.

Investigations reveal:

LH 5.1 IU/L(2-10)

FSH 4.3 IU/L(2-10)

Testosterone 15.3 nmol/L(9-30)

Which of the following is the most likely cause of his azoospermia?

- 1- Androgen insensitivity
- 2- Genital tract obstruction
- 3- Idiopathic testicular failure
- 4- Kallman's syndrome
- 5- Sperm autoimmunity

Answer & Comments

Answer: 2- Genital tract obstruction

Azoospermia can occur because of reproductive tract obstruction or inadequate production of spermatozoa. It is diagnosed after centrifuged samples of complete semen specimens are analysed microscopically. History, physical examination and hormone analysis are needed to determine the cause. In less than 10% of cases a testicular biopsy is required to diagnose the cause of azoospermia.

Obstructive azoospermia may be congenital (absence of the vas deferens, idiopathic epididymal obstruction) or acquired (from infection, vasectomy, trauma). Couples in whom the man has congenital reproductive tract obstruction should have cystic fibrosis gene mutation analysis for both partners, as there is a high risk of the male being a CF carrier. Acquired obstruction of the genital tract can be treated using microsurgical reconstruction. Alternatively, sperm can be retrieved from the testes and subsequently used for assisted reproduction.

The cause of non-obstructive azoospermia needs to be identified prior to any treatment.

Androgen insensitivity syndrome results from the inability of cells to respond to androgens. In males, this can prevent masculinisation of the genitalia and development of secondary sexual characteristics. You would therefore expect some phenotypic abnormalities, as well as elevated LH levels.

LH is raised in cases of idiopathic testicular failure.

Kallman's syndrome is hypothalamic gonadotrophin releasing hormone (GnRH) deficiency associated with hyposmia or anosmia. Serum LH and FSH are low.

Antisperm antibodies can cause 'immune infertility'. Sperm are usually present in semen but are unable to penetrate the cervical mucus to gain access to the ovum.



[Q: 2346] OnExamination 2012 - Endocrinology

A 17-year-old male with type 1 diabetes presents for annual review.

He takes three times daily short acting insulin with evening dose long acting insulin. His glycaemic control is good as reflected by an HbA1c of 6.5% (3.8-6.4).

He seeks advice regarding his ability to pursue a future career.

Which one of the following occupations would he be able to pursue?

- 1- A chef in the army catering corps
- 2- A police officer
- 3- A steward on board a cruise liner
- 4- An airline steward
- 5- An oil rig engineer

Answer & Comments

Answer: 4- An airline steward

Careers opportunities are affected by insulin use in diabetes mellitus and it is important to know these restrictions in order that you can provide appropriate advice to your patient.

Any employment in the armed forces, fire service or police force is not permissible unless already a member of the armed forces.

Offshore work also is not an option.



[Q: 2347] OnExamination 2012 - Endocrinology

A 69-year-old woman with a long history of rheumatoid arthritis comes to the clinic for review.

She has been feeling particularly tired over the past few months and has suffered three bouts of pneumonia in the past year. Her rheumatoid is particularly active, and she has significant ongoing pain affecting her toes, fingers, wrists and elbows.

Current medication includes methotrexate with folic acid cover.

On examination her BP is 142/81 mmHg, pulse is 72 and regular and she is afebrile. There is evidence of active synovitis affecting a number of joints. You can also palpate her spleen on examination of the abdomen.

Investigations show:

Haemoglobin 10.1 g/dl (13.5-17.7)

White cell count $4.1 \times 10^9/L$ (4-11)

Neutrophils $0.5 \times 10^9/L$ (2-7.5)

Platelets $152 \times 10^9/L$ (150-400)

ESR 65 mm/hr (<10)

Sodium 139 mmol/l (135-146)

Potassium 3.8 mmol/l (3.5-5)

Creatinine 123 micromol/l (79-118)

Which of the following is the most likely diagnosis?

- 1- Felty's syndrome
- 2- Methotrexate toxicity
- 3- Myelodysplasia
- 4- Myelofibrosis
- 5- Non-Hodgkin's lymphoma

Answer & Comments

Answer: 1- Felty's syndrome

This patient has Felty's syndrome as characterised by very active rheumatoid disease on the background of splenomegaly and elevated erythrocyte sedimentation rate (ESR) and neutropenia.

Felty's syndrome is a complication of rheumatoid arthritis (RA), defined as the triad of RA, neutropenia and splenomegaly. It is rare, and is most commonly seen in those with severe disease of more than 10 years duration. The cause is unknown, but it is linked with the HLA-DR4 genotype. 95% of patients are positive for rheumatoid factor.

Felty's can be asymptomatic, or can present with recurrent infections. The neutropenia is often severe (<0.2), which can lead to serious (and sometimes fatal) infections. Extra-articular features of RA are often present. Hepatomegaly and lymphadenopathy may be present. The diagnosis is clinical. Rarely, splenic rupture, hyperviscosity and leukaemia can complicate the condition.

Treatment is with immunomodulators, usually methotrexate. Alternative options are

hydroxychloroquine, ciclosporin, leflunomide and cyclophosphamide. Rituximab has been trialled with some success, but entercept has been linked with a reduction in neutrophil count. Splenectomy is generally reserved for those not responding to medical treatment. Patients should be immunised against influenza and pneumococcus if the neutropenia persists for more than a couple of weeks.

Methotrexate toxicity is the major differential, but the splenomegaly and evidence of active inflammation makes Felty's the more likely diagnosis.

Whilst haematological malignancies are also possible differentials, they would not be top of the list ahead of Felty's. However, a bone marrow biopsy could be indicated if symptoms and signs fail to improve with intensification of immunomodulator therapy.



[Q: 2348] OnExamination 2012 - Endocrinology

A 62-year-old man with a long history of type 2 diabetes presents with a swollen left ankle and forefoot. He says that it has been like that for a little while, and he does not notice much pain in the joint apart from an occasional ache.

He has significant neuropathy with numbness to pain and fine touch to his mid shins.

On examination his BP is 152/82 mmHg, his pulse is 82 and regular. His left ankle and forefoot are slightly warm to the touch, erythematous and swollen with obvious bony deformity.

Investigations show:

Haemoglobin 10.4 g/dl(13.5-17.7)

White cell count $9.1 \times 10^9/L$ (4-11)

Platelets $158 \times 10^9/L$ (150-400)

ESR 15 mm/hr(<10)

Sodium 138 mmol/l (135-146)

Potassium 3.7 mmol/l (3.5-5)

Creatinine 140 micromol/l (79-118)

HbA1c 8.4%(<5.5)

Which of the following interventions is most likely to impact on the condition of his left ankle?

- 1- Aircast boot immobilisation
- 2- Alendronate
- 3- Improved blood pressure control
- 4- Improved glucose control
- 5- IV antibiotic therapy

Answer & Comments

Answer: 1- Aircast boot immobilisation

This patient is most likely to be suffering from a Charcot's ankle. As such the most effective treatment is a period of immobilisation in a specially made cast.

The normal ESR and white cell count are against an alternative inflammatory or infective diagnosis.

Whilst there is some evidence that bisphosphonates improve the prognosis of the condition, they are likely to be ineffective in the absence of immobilisation.

It is clear that improved blood pressure control and diabetes control will impact on progression of microvascular disease, but they will not impact on the gross Charcot's deformity that this patient already has.

Given infection is highly unlikely, IV antibiotics will not have any impact in this case.



[Q: 2349] OnExamination 2012 - Endocrinology

A 62-year-old woman comes to the renal clinic reporting increased tiredness. Her creatinine has been stable at around 240 $\mu\text{mol/l}$ for the past few years and she takes multiple agents to control her blood pressure.

On examination her BP is 135/72 mmHg, her pulse is 69 and regular, and her BMI is 26. General physical examination is unremarkable.

Investigations show:

Haemoglobin 11.0 g/dl(11.5-16.0)

White cell count $9.3 \times 10^9/L$ (4-11)

Platelets $203 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 5.2 mmol/l (3.5-5)

Creatinine 242 $\mu\text{mol/l}$ (79-118)

Prolactin 700mU/l (<400)

Which of the following is the most likely diagnosis?

- 1- Amlodipine associated hyperprolactinaemia
- 2- Macroprolactinoma
- 3- Microprolactinoma
- 4- Ramipril associated hyperprolactinaemia
- 5- Renal failure associated hyperprolactinaemia

Answer & Comments

Answer: 5- Renal failure associated hyperprolactinaemia

Amlodipine and ramipril are not thought to be associated with a significant elevation in prolactin levels.

Macroprolactinoma would be associated with levels of prolactin of 3,000-6,000 or higher.

Microprolactinoma is associated with levels of prolactin of 1,000-3,000mU/l.



[Q: 2350] OnExamination 2012 - Endocrinology

You are considering prescribing intranasal calcitonin for the treatment of osteoporosis in a 70-year-old woman who has failed to tolerate weekly and then monthly

bisphosphonate therapy. She does not want to inject a PTH analogue or denosumab.

Which of the following correctly describes one of the actions of calcitonin?

- 1- Increased bone turnover
- 2- Increased osteoblast activity
- 3- Increased osteoclast activity
- 4- Increased urinary hydroxyproline excretion
- 5- Increased urinary sodium excretion

Answer & Comments

Answer: 5- Increased urinary sodium excretion

Calcitonin is associated with a marked decrease in bone turnover, and consequently a decrease in urinary hydroxyproline excretion.

Rather than increasing osteoblast activity, its primary mode of action is to decrease osteoclast activity.

It leads to a reduction in tubular reabsorption of sodium, and hence increased sodium excretion.



[Q: 2351] OnExamination 2012 - Endocrinology

A 42-year-old woman presents with lethargy and bony aches and pains. She is a frequent shift worker and works up to three nights per week.

There is no significant past medical history. On examination her BP is 122/71 mmHg, pulse is 70 and regular. She looks pale but examination is otherwise normal.

Investigations show:

Haemoglobin 11.5 g/dl(11.5-16.0)

White cell count $4.9 \times 10^9/L$ (4-11)

Platelets $192 \times 10^9/L$ (150-400)

Sodium 136 mmol/l (135-146)

Potassium 4.2 mmol/l (3.5-5)

Creatinine 90 micromol/l (79-118)

Calcium 2.14 mmol/l (2.2-2.61)

Alkaline phosphatase 145 U/l (39-117)

Which of the following is the most appropriate treatment?

- 1- Calcium and vitamin D supplementation
- 2- Cinacalcet
- 3- Low phosphate diet
- 4- Recombinant PTH
- 5- Shift pattern change

Answer & Comments

Answer: 1- Calcium and vitamin D supplementation

It is likely that this patient has osteomalacia, characterised by bony aches and pains, a low calcium and a mildly elevated bony alkaline phosphatase.

It is unlikely she will be able to change her shift pattern to increase sun exposure, making calcium and vitamin D supplementation the treatment of choice.

Cinacalcet is a treatment for tertiary hyperparathyroidism, and low phosphate diet may have a role in the management of renal impairment.

Recombinant parathyroid hormone (PTH) is a treatment for severe osteoporosis if bisphosphonates are unsuitable or not tolerated.



[Q: 2352] OnExamination 2012 - Endocrinology

A 52-year-old taxi driver with type 2 diabetes comes for review.

He is currently managed with metformin 1 g twice daily but finds it very difficult to comply with diet and lifestyle recommendations because of the nature of his work.

There is a past history of myocardial infarction for which he takes ramipril 10 mg, atorvastatin 10 mg, aspirin 75 mg and furosemide 40 mg daily.

On examination he has a BMI of 31.

Investigations show:

Haemoglobin 12.5 g/dl(13.5-18)

White cell count $5.0 \times 10^9/L$ (4-10)

Platelets $205 \times 10^9/L$ (150-400)

Sodium 140 mmol/l (134-143)

Potassium 5.0 mmol/l (3.5-5)

Creatinine 130 mol/l (60-120)

HbA1c 8.4%(<5.5)

According to ADA/EASD consensus, which of the following therapies would be most appropriate to gain additional glycaemic control?

- 1- Exenatide
- 2- Gliclazide
- 3- Insulin
- 4- Pioglitazone
- 5- Vildagliptin

Answer & Comments

Answer: 2- Gliclazide

Gliptins are not recommended in the current consensus.

This is because of:

Limited long term evidence with respect to glycaemic control

Modest short term effects

Potential for effects on the immune system.

Pioglitazone carries a contraindication with respect to heart failure and is therefore not an option.

Exenatide is not endorsed in the guidelines yet as an established therapy.

This leaves insulin and gliclazide as the options; insulin would put his taxi driving licence at risk, so gliclazide is the best possible choice.

Whilst it may be associated with increased risk of hypoglycaemia it is at least one of the shorter acting sulphonylureas (SUs) available.



[Q: 2353] OnExamination 2012 - Endocrinology

A 53-year-old male presents with a three month history of polyuria with polydipsia.

Which of the following measurements would confirm a diagnosis of diabetes mellitus?

- 1- A fasting plasma glucose of 6.5 mmol/L
- 2- A fasting plasma glucose of 7.5 mmol/l
- 3- A plasma glucose of 10 mmol/l at the end of an oral glucose tolerance test
- 4- A random glucose of 10.5 mmol/l
- 5- A urine dipstick analysis showing +++ glucose

Answer & Comments

Answer: 2- A fasting plasma glucose of 7.5 mmol/l

Diabetes mellitus is diagnosed on the basis of symptoms plus a random glucose above 11.1 mmol/l or fasting plasma glucose above 7 mmol/l or the two hour oral glucose tolerance test.

Impaired glucose tolerance would be indicated by a post OGTT plasma glucose between 7.7 and 11.1 or a fasting plasma glucose between 6.1 and 7.



[Q: 2354] OnExamination 2012 - Endocrinology

A 40-year-old man was referred to the endocrine clinic for his resistant hypertension.

He was taking the following medications: atenolol 50 mg once daily, ramipril 10 mg

once daily, doxazosin 4 mg daily, amlodipine 10 mg daily and bendroflumethiazide 2.5 mg daily.

On examination his pulse was 64 beats per minute, his blood pressure was 162/96 mmHg, heart sounds were normal and there were no cushingoid features.

Investigations showed:

Serum urea 4.4 mmol/L(2.5-7.5)

Serum creatinine 88 µmol/L(60-110)

Serum potassium 3.6 mmol/L(3.5-4.9)

Which is the most important medication to be discontinued before testing his aldosterone/plasma renin activity ratio?

- 1- Amlodipine
- 2- Atenolol
- 3- Doxazosin
- 4- Hydralazine
- 5- Verapamil

Answer & Comments

Answer: 2- Atenolol

Screening for hyperaldosteronism should be considered for hypertensive patients with hypokalaemia (not due to treatment), those with marked diuretic-induced hypokalaemia (<3.0) and those with refractory hypertension (failure to respond to three or more agents).

Primary hyperaldosteronism was previously believed to account for less than 1% of hypertension, but recent studies have shown a much higher prevalence (up to 12%) and have demonstrated that most patients are normokalaemic. Primary hyperaldosteronism may therefore be the most common potentially curable cause of hypertension, and as such should always be considered.

The renin/aldosterone ratio, together with cortisol, can be used to diagnose primary hyperaldosteronism when you would expect

the aldosterone to be high, renin low and normal cortisol.

Patients ingesting large amounts of sodium, those with renal impairment, or those taking β -blockers can have false-positive results. Salt-restriction, ACE inhibitors and angiotensin-receptor blockers, spironolactone and other diuretics can lead to false-negative results. α -blockers (for example, doxazosin) and calcium channel blockers (for example, amlodipine) are the hypertensives of choice in patients undergoing renin/aldosterone ratio measurements.

The effect of drugs on renin and angiotensin is seen below:

Drug Renin Aldosterone Effect

Non-dihydropyridine CCB Minimal Minimal No effect

Dihydropyridine CCB Minimal Decreased/minimal No effect

α -blockers Nil Nil No effect

Hydralazine Minimal Minimal No effect

ACE inhibitors & ARBs Increased Decreased False negative

Diuretics Increased markedly Increased False negative

Minoxidil Increased Minimal False negative

B-blockers Decreased Minimal False positive

Methyldopa Decreased Minimal False positive

Aldosterone levels can fall with severe illness, so testing should be done following recovery.



[Q: 2355] OnExamination 2012 - Endocrinology

A 60-year-old lady with dyslipidaemia, hypertension and angina has recently been diagnosed with impaired glucose tolerance (IGT).

Clinically she is obese with a BMI of 32 kg/m², her blood pressure is 140/80 mmHg. She is aware that having impaired glucose tolerance is a risk factor for type 2 diabetes and would like to discuss strategies to attenuate this risk.

Which of the following has been shown best to reduce the incidence of type 2 diabetes in individuals with IGT?

- 1- Acarbose 100 mg tds
- 2- Gliclazide
- 3- Intensive lifestyle change
- 4- Metformin 850 mg bd
- 5- Pioglitazone 15 mg daily

Answer & Comments

Answer: 3- Intensive lifestyle change

Both the diabetes prevention programme (DPP) and Finnish diabetes prevention study showed a 58% reduction in incidence of type 2 diabetes after intervention which involved intensive dietary change, increased physical activity and weight loss.

This compares with a 31% reduction in incidence when metformin was used.

Acarbose has also been shown to reduce the incidence of diabetes in combination with lifestyle change when compared with placebo.

The ACT now study has suggested that pioglitazone reduces progression from prediabetes to Type 2 diabetes, although it is not licensed for this purpose.

It was not licensed in the United Kingdom for diabetes prevention.



[Q: 2356] OnExamination 2012 - Endocrinology

A 45-year-old male presents with sweats and change in appearance.

A diagnosis of acromegaly is confirmed with failure to suppress GH concentrations on an

oral glucose tolerance test. MRI reveals a 0.5 cm microadenoma of the pituitary.

Which of the following is the most appropriate therapeutic option for this patient?

- 1- Depot somatostatin analogue
- 2- Dopamine agonist therapy
- 3- Pituitary surgery
- 4- Short acting somatostatin analogue
- 5- Stereotactic pituitary irradiation

Answer & Comments

Answer: 3- Pituitary surgery

Surgery is the most appropriate primary therapy for acromegaly with a cure rate of above 80% expected for a tumours of this size.

Although somatostatin analogues are very effective at suppressing growth hormone (GH) concentrations to what would be regarded as a 'cure' range (GH less than 5 μ u/l on day profile) their expense limits use on the longer term basis.

However in patients unsuitable for surgery or in those not cured following surgery SMS would be employed.



[Q: 2357] OnExamination 2012 - Endocrinology

Which of the following is regarded as a physiological effect of thyroid hormones?

- 1- Decrease gluconeogenesis
- 2- Enhance insulin sensitivity
- 3- Reduce myocardial oxygen demand
- 4- Reduce nerve conduction
- 5- Reduce oxidation of fatty acids in tissues

Answer & Comments

Answer: 2- Enhance insulin sensitivity

Thyroid hormones enhance

Insulin-dependent entry of glucose into cells

Myocardial oxygen consumption

Nerve conduction

Gluconeogenesis and

Oxidation of fatty acids.



[Q: 2358] OnExamination 2012 - Endocrinology

A 45-year-old female attends clinic complaining of tiredness. She is hypothyroid and takes thyroxine 150 micrograms daily.

Which of the following is the most useful test for assessing the appropriateness of thyroid hormone replacement in primary hypothyroidism?

- 1- Free T3 and T4 concentrations
- 2- Skin biopsy
- 3- Thyroid binding globulin
- 4- Total T3 and T4
- 5- TSH

Answer & Comments

Answer: 5- TSH

Thyroid-stimulating hormone (TSH) has been recognised as an exquisitely sensitive indicator of thyroid status.

A normal TSH result suggests adequate thyroid hormone replacement and euthyroidism.

Similarly elevated TSH with normal thyroid hormone concentrations would suggest poor compliance and suppressed TSH with normal high thyroxine (T4) suggests over-replacement.



[Q: 2359] OnExamination 2012 -
Endocrinology

A 26-year-old man with a three year history of type 1 diabetes presents with fever, vomiting and is dehydrated.

Investigations revealed:

Sodium 148 mmol/L (137-144)

Potassium 3.3 mmol/L (3.5-4.9)

Urea 24 mmol/L (2.5-7.5)

Glucose 33 mmol/L (3.0-6.0)

Blood pH 7.18 (7.36-7.44)

What would be the typical total body water deficit associated with his diabetic ketoacidosis (DKA)?

- 1- 1 litre
- 2- 3 litres
- 3- 6 litres
- 4- 8 litres
- 5- 10 litres

Answer & Comments

Answer: 3- 6 litres

The typical fluid deficit associated with DKA is approximately 6 litres.

The initial half of this amount is derived from intracellular fluid and precedes signs of dehydration, while the other half is from extracellular fluid and is responsible for clinical signs of dehydration.

Appropriate fluid replacement requires 1 litre of normal saline over the first 1/2 hour, then 1 litre over the next hour, then 1 litre over the next two hours followed by 1 litre every 4 hours depending on the degree of dehydration.



[Q: 2360] OnExamination 2012 -
Endocrinology

A 57-year-old male with diabetes requests

sildenafil for erectile dysfunction.

Which of the following are contraindicated with sildenafil?

- 1- Carbamazepine
- 2- Carvedilol
- 3- Indomethacin
- 4- Nicorandil
- 5- Valsartan

Answer & Comments

Answer: 4- Nicorandil

Sildenafil is contraindicated if the patient is taking nitrates, or nitrate derivatives (nicorandil).

We are informed on the prescribing information that if the patient takes nitrates then they should be stopped for the period during which sildenafil is used.



[Q: 2361] OnExamination 2012 -
Endocrinology

A 37-year-old female with type 2 diabetes and obesity requests help with regard to weight loss. She has tried to lose weight with dietary manoeuvres but has succeeded in losing only 3 kg over the last year. She is currently receiving no treatment.

On examination her BMI is 33.5 kg/m² and her blood pressure is 142/84 mmHg. Her most recent HbA1c is 6.9% (3.8-6.4).

She asks whether there are any pharmacological therapies that may be appropriate for assisting with weight reduction.

Which of the following agents is appropriate for assisting with weight loss in this patient?

- 1- Dexfenfluramine
- 2- Insulin detemir
- 3- Metformin
- 4- Orlistat

5- Phentermine

Answer & Comments

Answer: 4- Orlistat

This patient has demonstrated a 3 kg weight loss over the past year but, like many, has become rather stuck.

The NICE criteria for orlistat previously stated it should be used in patients who have demonstrated dietary compliance with at least a 2.5 kg weight reduction prior to initiating orlistat. This is not now a requirement. Continued weight reduction is required if the patient is to remain on the drug (5% body weight at 12 weeks).

Orlistat functions through inhibiting the absorption of dietary fat from the gastrointestinal tract. Consequently, its side effects include flatulence and diarrhoea.

Dexfenfluramine is associated with systemic hypertension and strokes and is now withdrawn as an anti-obesity agent, as is phentermine (valvular fibrosis) in the successful but dangerous combination Phen-Fen.

Metformin is not an agent that would create weight loss, but merely improves insulin sensitivity and maintains weight (or gain weight as in sulphonylurea therapy). Similarly this patient's HbA1c is well controlled on diet alone.

Insulin detemir has been associated with less weight-gain or even slight weight-loss compared with other insulins. However, her HbA1c is at target (less than 7%) and therefore she does not require additional anti-glycaemic therapy at this time.



[Q: 2362] OnExamination 2012 - Endocrinology

A 55-year-old female presents with episodic sweats and tremors which are relieved by

glucose. She has gained approximately 6 kg in weight of late and drinks approximately 10 units of alcohol weekly.

Her investigations show normal full blood count, normal urea and electrolytes and a fasting plasma glucose concentration of 4 mmol/l (3.0-6.0).

What is the most appropriate investigation for this patient?

- 1- 72 hour fast
- 2- CT scan of pancreas
- 3- EEG
- 4- Insulin and C peptide concentration
- 5- Oral glucose tolerance test

Answer & Comments

Answer: 1- 72 hour fast

This patient describes symptoms suggestive of hypoglycaemia which are relieved by carbohydrate. The likely cause is an insulinoma which is producing the weight gain.

The standard method for achieving a diagnosis is during a 72 hour fast by demonstration of inappropriately high insulin and C peptide during spontaneous hypoglycaemia.

Measurement of C peptide is useful for excluding factitious hypoglycaemia from self injection of insulin. Insulin preparations contain no C peptide.



[Q: 2363] OnExamination 2012 - Endocrinology

A 32-year-old woman presents with a one year history of secondary amenorrhoea.

She had been prescribed temazepam and dihydrocodeine.

On examination she had galactorrhoea. Her serum prolactin was noted to be 6000 mU/l (<450 mU/l).

What is the most likely diagnosis?

- 1- Drug-induced hyperprolactinaemia
- 2- Hypothyroidism
- 3- Pituitary dependent Cushing's disease
- 4- Pituitary microadenoma
- 5- Stress

Answer & Comments

Answer: 4- Pituitary microadenoma

The patient has amenorrhoea, galactorrhoea and a grossly elevated prolactin concentration of 6000. The diagnosis is likely to be a prolactinoma, most likely due to a pituitary microadenoma (microprolactinoma).

The prescribed drugs would not cause hyperprolactinaemia.

Drugs that are responsible include:

Dopamine antagonists

Antipsychotics (haloperidol, sulpiride)

Metoclopramide

Domperidone

Selective serotonin reuptake inhibitors (SSRIs) to a lesser extent.

There is nothing in this patient's history to suggest either hypothyroidism or Cushing's.

Hypothyroidism may cause hyperprolactinaemia but is usually mild.

Stress would not produce such a picture.



[Q: 2364] OnExamination 2012 - Endocrinology

A diagnosis of diabetes mellitus is being considered in 32-year-old woman who is 16 weeks pregnant. Her body mass index (BMI) was 22 kg/m² (18 - 25).

A 75g oral glucose tolerance test (OGTT) revealed:

TimePlasma glucose concentration

0 hr 6.0 mmol/l (3.0-6.0)

2hr 12.5 mmol/l (<11.1)

Which of the following is the most appropriate step in the management of this patient?

- 1- Glipizide therapy
- 2- Insulin therapy
- 3- Low calorie diet and exercise
- 4- Metformin therapy
- 5- Repeat her oral glucose tolerance test in four weeks

Answer & Comments

Answer: 3- Low calorie diet and exercise

2.5% of pregnancies in England and Wales involve women with diabetes. Approximately 87% of these are due to gestational diabetes, 7.5% type 1 diabetes and 5% type 2 diabetes. There are a number of risks to both mother and fetus, including miscarriage, pre-eclampsia, preterm labour, stillbirth, congenital malformations, macrosomia, birth injury, perinatal mortality and neonatal hypoglycaemia.

Risk factors for gestational diabetes are BMI >30 kg/m², previous macrosomic baby (>4.5kg), previous gestational diabetes, first-degree relative with diabetes, ethnic origin (South Asian, Caribbean, Middle Eastern). Screening with fasting plasma glucose, random blood glucose, glucose challenge tests and urinalysis is recommended for any women with one of these risk factors. The 2-hour 75g oral glucose tolerance test is used to definitively diagnose gestational diabetes. This is performed at 16-18 weeks in women who have been affected in a previous pregnancy (with home BM monitoring prior to this, and a repeat test at 28 weeks if this is normal) and 24-28 weeks for women with any other risk factor.

If it is safely achievable, women with gestational diabetes should aim to keep

fasting blood glucose between 3.5-5.9mmol/litre and one hour postprandial blood glucose below 7.8mmol/litre during pregnancy. It is important to note HbA1c should not be routinely used to monitor glycaemic control in the second and third trimesters.

Most gestational diabetes will respond to changes in diet and exercise. Only 10-20% of women need oral hypoglycaemia agents or insulin therapy. Women should therefore be given dietary advice, and those with a pre-pregnancy BMI of >27 should be advised to restrict calorie intake and exercise for at least 30 minutes daily.

Hypoglycaemic therapy should be considered for women in whom diet and exercise fails to maintain blood glucose targets during a period of 1-2 weeks. If there is any evidence of fetal macrosomia therapy should be initiated immediately. Treatment should be tailored to the individual women, but in general may include oral hypoglycaemics (metformin and glibenclamide) and insulin. There is insufficient evidence regarding long-acting insulin analogues, and isophane insulin therefore remains the first choice for long-acting insulin during pregnancy. Insulin aspart and lispro are safe rapid-acting analogues.

Women with insulin-treated gestational diabetes should be advised of the risk of hypoglycaemia (which they may be unaware of) and provided with a concentrated glucose solution.

During labour and birth, capillary blood glucose should be monitored on an hourly basis in patients with diabetes and maintained between 4 and 7mmol/litre. This may require the use of a sliding scale.

In this patient diet and exercise has not yet been trialled, and there is no mention of foetal macrosomia. Metformin can then be started if glycaemic control is not achieved within 1-2 weeks. Waiting another four weeks to instigate therapy exposes both mother and

foetus to potential harm. Insulin can be used if glycaemic control is not achieved with metformin. Glipizide is not used in pregnancy.



[Q: 2365] OnExamination 2012 - Endocrinology

A 30-year-old female presents with mild galactorrhoea.

Biochemistry reveals an elevated prolactin of 1200 mU/L (50-450) and an oestradiol concentration of 100 pmol/L (130-450).

Which of the following is the likely cause?

- 1- Addison's disease
- 2- Hyperthyroidism
- 3- Non-functioning pituitary tumour (NFPT)
- 4- Post-cranial irradiation for acute lymphocytic leukaemia as a child
- 5- Sheehan's syndrome

Answer & Comments

Answer: 3- Non-functioning pituitary tumour (NFPT)

Addison's may be associated with hypogonadism but prolactin (PRL) concentrations are usually normal.

Severe hypothyroidism is associated with hyperPRL hypogonadism.

An NFPT may cause hyperprolactinaemia through stalk compression.

Sheehan's syndrome is associated with a low prolactin concentration.

Cranial irradiation may initially cause hyperprolactinaemia but a low PRL is typical after a year.



[Q: 2366] OnExamination 2012 - Endocrinology

A 26-year-old woman presents with episodes of dizziness mainly on standing.

Her biochemical profile shows hyperkalaemic acidosis.

Which underlying condition is she most likely to have?

- 1- Addison's disease
- 2- Bulimia nervosa
- 3- Conn's syndrome
- 4- Cushing's syndrome
- 5- Type 1 renal tubular acidosis

Answer & Comments

Answer: 1- Addison's disease

Her symptoms are suggestive of postural hypotension, which together with hyperkalaemic (and hyponatraemia) acidosis would strongly indicate the presence of Addison's disease.

Cushing's and Conn's syndromes are associated with hypertension and hypokalaemia.

Hypokalaemia is the most frequent complication of bulimia which may cause cardiac arrhythmias, fits and paraesthesia.

Renal tubular acidosis (RTA) is due to inability of the renal tubules to maintain acid-base balance causing a hyperchloraemia and a normal anion-gap.

In type 1 (distal) RTA there is hypokalaemic acidosis with low urinary ammonium production. Patients present with hyperventilation/acidosis and muscular weakness from hypokalaemia.

In type 4 RTA (hyporeninaemic hypoaldosteronism) there is hyperkalaemic acidosis caused by chronic renal insufficiency from diabetes or tubulointerstitial disease.



[Q: 2367] OnExamination 2012 - Endocrinology

A 26-year-old female presents with a six week

history of galactorrhoea. She has no other symptoms but takes medication for contraception, dyspepsia and migraine.

Examination reveals slight galactorrhoea with expression from both breasts but is otherwise normal.

Investigations show:

Prolactin 915 mU/L(< 450)

Which one of the following drugs may be responsible?

- 1- Codeine phosphate
- 2- Metoclopramide
- 3- Omeprazole
- 4- Oral contraceptive pill
- 5- Sumatriptan

Answer & Comments

Answer: 2- Metoclopramide

Metoclopramide acts as a dopamine antagonist. Dopamine inhibits the release of prolactin from the anterior pituitary gland.

Therefore, metoclopramide can predispose to hyperprolactinaemia and consequent galactorrhoea.



[Q: 2368] OnExamination 2012 - Endocrinology

A 19-year-old female is concerned following exposure to meningococcal meningitis. Her flatmate contracted meningococcal meningitis and she now wants preventative treatment.

She is generally well without any past medical history. She takes Logynon as a contraceptive agent and uses a salbutamol inhaler infrequently.

Which prophylactic antimicrobial treatment would you select?

- 1- Augmentin
- 2- Ciprofloxacin
- 3- Clarithromycin

4- Doxycycline

5- Rifampicin

Answer & Comments

Answer: 2- Ciprofloxacin

Rifampicin is a reasonable choice as prophylaxis against meningococcal infection but in this 19-year-old sexually active student may be expected to reduce the efficacy of the oral contraceptive through liver enzyme induction.

Therefore Ciproxin would be the most appropriate agent from the above list as it does not induce cytochrome p450.



[Q: 2369] OnExamination 2012 - Endocrinology

A 58-year-old man presents with a history of indigestion which has been steadily worsening over the past few months. He tells you that he has lost 4 kg in weight in the past half a year.

There is no past medical history of note apart from smoking of 10 cigarettes / day. On examination his BP is 152/90 mmHg, pulse is 75 and regular. His BMI is 22.

Investigations show:

Haemoglobin 10.9 g/dl(13.5-17.7)

White cell count $7.5 \times 10^9/L$ (4-11)

Platelets $280 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (135-146)

Potassium 3.9 mmol/l (3.5-5)

Creatinine 88 $\mu\text{mol/l}$ (79-118)

Which of the following is the most appropriate course of action?

1- Barium swallow

2- Magnesium trisilicate

3- Omeprazole

4- Ranitidine

5- Upper GI endoscopy

Answer & Comments

Answer: 5- Upper GI endoscopy

Barium swallow is not the usual first line investigation, with upper gastrointestinal (GI) endoscopy preferred for the majority of patients.

Magnesium trisilicate is an antacid used for short term relief of symptoms only.

Ranitidine is predominantly used now as an over the counter indigestion relief tablet.

Omeprazole is standard pharmacological therapy for gastro-oesophageal reflux disease, although not until an endoscopy has excluded a serious underlying diagnosis in this case.



[Q: 2370] OnExamination 2012 - Endocrinology

A 42-year-old publican who has a significant problem with excess alcohol consumption comes to the clinic for review.

He has had persistent diarrhoea which he says is difficult to flush away and intermittent upper abdominal pain.

On examination his BP is 125/72 mmHg, his pulse is 75 and his BMI is 21. He has signs of chronic liver disease.

Investigations show:

Haemoglobin 10.2 g/dl(13.5-17.7)

White cell count $8.3 \times 10^9/L$ (4-11)

Platelets $198 \times 10^9/L$ (150-400)

Sodium 137 mmol/l (135-146)

Potassium 3.9 mmol/l (3.5-5)

Creatinine 90 $\mu\text{mol/l}$ (79-118)

Calcium 2.1 mmol/l (2.2-2.61)

Alanine aminotransferase 92 U/l (5-40)

Albumin 25g/l (35-50)

You suspect malabsorption.

Which of the following is the most appropriate initial test as a pointer to the diagnosis?

- 1- Abdominal CT
- 2- Abdominal ultrasound
- 3- ERCP
- 4- Faecal elastase
- 5- Secretin stimulation test

Answer & Comments

Answer: 4- Faecal elastase

Abdominal ultrasound, CT and ERCP may all indicate structural changes consistent with chronic pancreatitis, but do not provide the link to function and thus the cause of the diarrhoea.

As such faecal elastase is the preferred answer.

The secretin stimulation test is also a test of exocrine function but is invasive and therefore not a preferred investigation.



[Q: 2371] OnExamination 2012 - Endocrinology

A 41-year-old woman presents with palpitations and weight loss to the endocrine clinic. She has lost over two stone over the last four months and is increasingly anxious.

On examination her BMI is 20, her BP is 135/72 mmHg, and her pulse is 90 and regular. She has a fine tremor. A TSH is measured at <0.05.

Which of the following would you expect to find on further questioning or clinical examination?

- 1- Constipation
- 2- Decreased libido
- 3- Dry skin
- 4- Menorrhagia
- 5- Weight gain

Answer & Comments

Answer: 2- Decreased libido

Constipation, dry skin, menorrhagia and weight gain are more commonly described as being associated with hypothyroidism.

More rarely patients may gain weight in hyperthyroidism however, when they succeed in eating more food than is required to compensate for their increased basal metabolic rate.



[Q: 2372] OnExamination 2012 - Endocrinology

A 45-year-old man is referred to the endocrine clinic by his GP.

He has been found on routine new patient screening to have an isolated elevated calcium of 2.9 mmol/l. There is no past medical history of note, and clinical examination is entirely normal.

On further questioning you understand that his father and uncle have been reported to have high calcium levels but had no other significant problems.

Investigations show:

Haemoglobin 13.7 g/dl (13.5-17.7)

White cell count $8.0 \times 10^9/L$ (4-11)

Platelets $202 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (135-146)

Potassium 3.8 mmol/l (3.5-5)

Creatinine 117 $\mu\text{mol/l}$ (79-118)

Calcium 2.89 mmol/l (2.20-2.62)

What is the diagnosis?

- 1- Familial isolated hyperparathyroidism (FIHP)
- 2- Hyperparathyroidism jaw tumour syndrome
- 3- MEN 1
- 4- MEN 2a
- 5- MEN 2b

Answer & Comments

Answer: 1- Familial isolated hyperparathyroidism (FIHP)

Hyperparathyroidism jaw tumour syndrome is a syndrome of hyperparathyroidism and fibro-osseous tumours of the jaw. It is described as having increased incidence in Romany families.

MEN 1 is associated with hyperparathyroidism in 80%, pancreatic tumours and pituitary adenomas.

MEN 2a is associated with parathyroid hyperplasia, medullary carcinoma of the thyroid, and pheochromocytoma.

Parathyroid hyperplasia is not a usual feature of MEN 2b.



[Q: 2373] OnExamination 2012 - Endocrinology

A 16-year-old boy with short stature, bony aches and pains, and learning difficulties comes to the clinic for review.

The most marked abnormality on examination is a short fifth digit on each hand.

Investigations reveal a calcium of 2.05 mmol/l (2.20-2.61), and a phosphate of 1.8 mmol/l (0.8-1.5).

Which of the following abnormalities is most likely to be present?

- 1- Alpha subunit G protein mutation
- 2- Beta subunit G protein mutation
- 3- Gamma subunit G protein mutation
- 4- Renal tubular disorder
- 5- Vitamin D receptor mutation

Answer & Comments

Answer: 1- Alpha subunit G protein mutation

Mutations in the other G protein subunits do not occur in pseudohypoparathyroidism, so B and C are incorrect.

Whilst a renal tubular disorder or vitamin D receptor mutation could in theory lead to hypocalcaemia, the short digit seen in this patient is characteristic of pseudohypoparathyroidism.



[Q: 2374] OnExamination 2012 - Endocrinology

A 25-year-old woman presents with sickness and lethargy some 10 weeks into her first pregnancy.

She was previously fit and well with no significant medical history. On examination her BMI is 22, her BP is 95/60 mmHg, pulse is 75. There are no abnormal findings on examination.

Investigations show:

Haemoglobin 10.4 g/dl(11.5-16.0)

White cell count $4.9 \times 10^9/l$ (4-11)

Platelets $177 \times 10^9/l$ (150-400)

Sodium 136 mmol/l (135-146)

Potassium 3.2 mmol/l (3.5-5)

Creatinine 90 micromol/l (79-118)

TSH 0.2(0.5-4.5)

Which of the following is the most likely diagnosis?

- 1- De Quervain's thyroiditis
- 2- Graves' disease
- 3- Hashimoto's disease
- 4- Hyperemesis gravidarum
- 5- Riedel's thyroiditis

Answer & Comments

Answer: 4- Hyperemesis gravidarum

We are told that this patient has significant problems with sickness, which may be driven by high levels of beta-human chorionic gonadotropin (HCG).

Beta-HCG has a degree of thyroid stimulating activity. In the circumstances it is likely that this has driven thyroid-stimulating hormone (TSH) down to below the lower limit of normal. No intervention is necessary, and there is no value in using anti-thyroid drugs in this situation.

De Quervain's thyroiditis follows symptoms of a viral illness and is usually associated with pain over the gland. It may be associated with transient hypo- or hyperthyroidism.

Graves' disease is associated with a goitre and thyrotoxicosis.

Hashimoto's is associated with hypothyroidism.

Riedel's is associated with a woody feel to the gland.



[Q: 2375] OnExamination 2012 - Endocrinology

A 16-year-old boy comes to the endocrine clinic with his father; he is tall and thin but is most concerned because his voice has not properly broken and he has not started to go through puberty.

Other past history of note is that he has complained to his GP on a number of occasions that he has no sense of smell, and that food tastes bland.

On examination he is 184 cm in height. His BMI is 21, his BP is 125/80 mmHg. He has very sparse sexual hair, small testes and an underdeveloped phallus.

Investigations show:

Haemoglobin 13.4 g/dl(11.5-16.5)

White cells $7.4 \times 10^9/L$ (4-11)

Platelet $205 \times 10^9/L$ (150-400)

Sodium 140 mmol/l (135-146)

Potassium 4.2 mmol/l (3.5-5)

Creatinine 92 $\mu\text{mol/l}$ (79-118)

Serum testosterone 4 nmol/l (9-42)

Which of the following is the most likely diagnosis?

1- Kallmann's syndrome

2- Klinefelter's syndrome

3- Noonan's syndrome

4- Pituitary apoplexy

5- Testicular feminisation

Answer & Comments

Answer: 1- Kallmann's syndrome

A number of genes including KAL-1 and FGFR-1 are involved in the formation of the olfactory bulb area of the brain, which as well as being responsible for sense of smell, is also involved in the production of gonadotropin-releasing hormone (GnRH).

Failure of this area of the brain to develop leads to an absent sense of smell and either not entering or partial puberty.

GnRH or gonadotrophin-based preparations can be used to restore fertility, or testosterone can be used to drive development of secondary sexual characteristics.

A. Kallmann's syndrome is the correct answer because anosmia, failure to enter puberty, and low testosterone are typical of the condition.

B. Klinefelter's syndrome is incorrect because the lack of sense of smell should point you towards Kallman's as the alternative diagnosis.

C. Noonan's syndrome is incorrect because it is associated with short stature, webbing of the neck, scoliosis, ligamentous laxity, and pectus excavatum.

D. Pituitary apoplexy is incorrect because it is associated with deficiency of multiple pituitary hormones.

E. Testicular feminisation is incorrect because it is associated with androgen insensitivity and subjects look externally female.



[Q: 2376] OnExamination 2012 - Endocrinology

A 43-year-old woman presents with a lump on the left side of her neck.

There is no evidence of hypo- or hyperthyroidism on symptom check and there is no history of recent weight change. The only medication of note is the progesterone only pill.

On examination her BP is 135/80 mmHg, her pulse is 68 and regular. Her BMI is 24, she has a left sided thyroid nodule approximately 0.8 cm in diameter. Her TSH is normal at 3.6 mU/L.

Which of the following is the most appropriate initial investigation?

- 1- CT scan neck
- 2- Fine needle aspiration
- 3- Free T3/T4
- 4- Radionucleotide scan
- 5- Ultrasound scan neck

Answer & Comments

Answer: 5- Ultrasound scan neck

Ultrasound is the initial investigation of choice for thyroid nodules; it can visualise cystic lesions 2 mm or more in diameter, and solid lesions 3 mm or more in diameter.

It is far more sensitive than palpation alone, with less than 10% of nodules detected by ultrasound being clinically palpable. Ultrasound is used to inform progression to fine needle aspiration.

Option A is not correct because CT scanning is usually only performed to examine for local spread of malignant disease or for degree of compression of other structures in the neck.

Option B is not correct because fine needle aspiration follows on from ultrasound scanning.

Option C is not correct because in view of a normal thyroid-stimulating hormone (TSH), tri-iodothyronine/thyroxine (T3/T4) are unlikely to be abnormal or contribute to the underlying diagnosis.

Option D is not correct because radionucleotide scanning is used for the investigation of thyroiditis or a toxic adenoma.

Option E is the correct initial investigation for thyroid nodules.



[Q: 2377] OnExamination 2012 - Endocrinology

A 48-year-old patient presents to the clinic with a gradual change in her facial appearance, swelling of her fingers so that her rings no longer fit, sweating, hypertension and worsening problems with sleep apnoea. You understand she has recently had surgery for bilateral carpal tunnel syndrome.

On examination she is hypertensive at 150/90 mmHg. She has coarsening of facial features with prognathism which is obvious when you look at old photos from her album; her hands and feet look enlarged.

Investigations show

Haemoglobin 14.1 g/dl (11.5-16.5)

White cell count $6.8 \times 10^9/L$ (4-11)

Platelets $183 \times 10^9/L$ (150-400)

Sodium 141 mmol/l (135-146)

Potassium 3.9 mmol/l (3.5-5)

Creatinine 102 $\mu\text{mol/l}$ (79-118)

TSH 3.1 mU/l (0.5-5.0)

Free thyroxine 13.2 pmol/l (10-25)

Glucose 4.6 mmol/l (4.5-5.6)

Which of the following is the investigation most likely to elucidate the underlying diagnosis?

- 1- Glucose tolerance test with growth hormone monitoring
- 2- Growth hormone releasing hormone
- 3- Insulin tolerance test with growth hormone monitoring
- 4- Prolactin
- 5- Random growth hormone level

Answer & Comments

Answer: 1- Glucose tolerance test with growth hormone monitoring

This patient's features are consistent with a diagnosis of acromegaly.

A glucose tolerance test with growth hormone measurement is useful with respect to screening as growth hormone is usually suppressed by hyperglycaemia to a level below 0.3 mcg/l.

Serum IGF1 is also particularly useful as it has a long half life and is elevated in conjunction with acromegaly.

MRI is useful for tumour localisation.

Prolactin may of course be elevated because of local pressure effect from a growth hormone producing adenoma.



[Q: 2378] OnExamination 2012 - Endocrinology

On routine screening of a 50-year-old woman who complained of tiredness, she is found to be hypercalcaemic.

She is being treated for manic depression, and cardiac failure.

Which of the following is most likely to be the cause of the raised calcium?

- 1- ACE inhibitor therapy
- 2- Furosemide therapy
- 3- Lithium therapy
- 4- Seroxat treatment

- 5- Vitamin D deficiency

Answer & Comments

Answer: 3- Lithium therapy

Lithium can produce diabetes insipidus and also raise calcium.

Neither Seroxat nor angiotensin-converting enzyme (ACE) inhibitors are related to hypercalcaemia.

Excess of vitamin D causes elevated calcium.

Furosemide lowers calcium but thiazides reduce excretion and so can exacerbate hypercalcaemia.



[Q: 2379] OnExamination 2012 - Endocrinology

A 58-year-old woman is admitted with a collapse and palpitations, having passed out in front of her husband whilst coming out of the bathroom. She has a history of severe diarrhoea over the past few days.

Medical history of note includes ketoconazole for a fungal infection, and bendroflumethiazide for hypertension.

On examination her BP is 100/60 mmHg, her pulse is 80. She looks dehydrated. Whilst you are watching her monitor she feels unwell again and you notice a run of torsades de pointes VT.

Which of the following electrolyte abnormalities is likely to be contributing to her risk of VT?

- 1- Hyperkalaemia
- 2- Hypernatraemia
- 3- Hyperuricaemia
- 4- Hypocalcaemia
- 5- Hypomagnesaemia

Answer & Comments

Answer: 5- Hypomagnesaemia

This woman is taking ketoconazole, which is known to lead to possible QT prolongation and increase the risk of torsades de pointes VT.

Additionally, she has been suffering from severe diarrhoea which will lead to GI magnesium loss, and is taking bendroflumethiazide which in itself contributes to low magnesium levels.

She should have her magnesium levels measured early, and be considered for IV magnesium supplementation if she is found to be hypomagnesaemic.

Of course it is also vitally important to stop her ketoconazole.



[Q: 2380] OnExamination 2012 - Endocrinology

A 32-year-old lady presented with episodes of polydipsia and polyuria for the last six months.

Investigations revealed:

Serum Urea 8.1 mmol/L(2.5-7.5)

Serum Creatinine 92 µmol/L(60-110)

Serum corrected Calcium 2.85 mmol/L(2.2-2.6)

Serum phosphate 0.75 mmol/L(0.8-1.4)

Plasma parathyroid hormone 6.2 pmol/L(0.9-5.4)

Which of the following is directly responsible for her increased reabsorption of calcium in the distal tubule of the kidney?

- 1- 1,25 Dihydroxy vitamin D
- 2- 25 Hydroxy vitamin D
- 3- Calcitonin
- 4- Hypophosphataemia
- 5- Parathyroid hormone

Answer & Comments

Answer: 5- Parathyroid hormone

This patient has hypercalcaemia due to hyperparathyroidism.

Parathyroid hormone has a number of direct effects, enhancing:

The release of calcium from bones by binding to osteoblasts which stimulates the formation of osteoclasts, and

Reabsorption of calcium in the distal tubules.



[Q: 2381] OnExamination 2012 - Endocrinology

A 44-year-old man presents with new onset bilateral gynaecomastia.

He has been diagnosed with Zollinger-Ellison syndrome in the last year.

He underwent normal puberty at age 14.

Which of the following drugs would be most likely to cause gynaecomastia?

- 1- Cimetidine
- 2- Famotidine
- 3- Lansoprazole
- 4- Rabeprazole sodium
- 5- Ranitidine

Answer & Comments

Answer: 1- Cimetidine

The answer to this question is cimetidine which is an H2 receptor antagonist. Blockade of androgen-responsive receptors in the target organ appears to be the most likely mechanism involved.

Research has shown that the other drugs listed above, which may also be used as part of the treatment of Zollinger-Ellison syndrome, have a much lower - almost insignificant - risk in the development of gynaecomastia.

Other drugs that can cause gynaecomastia include:

Spironolactone

Digoxin

Methyldopa

Gonadotrophins

Cyproterone acetate.

Zollinger-Ellison syndrome:

The association of peptic ulcer with a gastrin-secreting pancreatic adenoma; 50-60% are malignant.

It occurs in approximately 0.1% of patients with duodenal ulcer disease and is to be suspected in those with multiple peptic ulcers that are resistant to drugs.



[Q: 2382] OnExamination 2012 - Endocrinology

A 33-year-old female presents with a one year history of galactorrhoea and amenorrhoea. She informs you that she does not want to become pregnant.

On examination there is galactorrhoea to expression and visual fields are normal to confrontation.

Investigations confirm the diagnosis of a macroprolactinoma, with a prolactin concentration of 10,500 mu/l (50-500) and MRI of the pituitary revealing a 1.5 cm tumour with some suprasellar extension.

What is the most appropriate treatment for this woman?

- 1- Cabergoline therapy
- 2- Combined oral contraceptive
- 3- Pituitary surgery
- 4- Somatostatin analogue therapy
- 5- Stereotactic pituitary irradiation

Answer & Comments

Answer: 1- Cabergoline therapy

This young woman has a macroprolactinoma and these are exquisitely sensitive to dopamine agonist therapy and rapid tumour reduction with restoration of menses and cessation of galactorrhoea expected.

Pituitary surgery is rarely required in prolactinomas and is generally reserved for patients intolerant of or resistant to dopamine agonist therapy.

Even with large tumours that compress the chiasm, these can be treated with dopamine agonists with rapid reduction in size and relief of pressure.

The fact that she does not want to become pregnant is a bit of an irrelevance. One would still treat her with dopamine agonist therapy and suggest use of appropriate contraception which could include the OCP.



[Q: 2383] OnExamination 2012 - Endocrinology

A 26-year-old female with no previous history of diabetes presents with a first episode of diabetic ketoacidosis. There is no evidence of infection but she has recently commenced a new medication.

Which of the following drugs is implicated in precipitating diabetic ketoacidosis?

- 1- Olanzapine
- 2- Omeprazole
- 3- Progestogen only contraceptive pill
- 4- Sodium valproate
- 5- Venlafaxine

Answer & Comments

Answer: 1- Olanzapine

The atypical antipsychotics such as olanzapine have been implicated in precipitating diabetes as well as diabetic ketoacidosis.

Other drugs implicated include thiazide diuretics, beta sympathomimetics and steroids.



[Q: 2384] OnExamination 2012 - Endocrinology

A 17-year-old boy was brought to clinic as his parents were concerned regarding possible delayed puberty.

He was otherwise well, played sports regularly and academic performance was good. His height was 1.7 m and weight was 70 kg.

On examination he had small penis and testes, absent pubic hair, but no other abnormalities.

Investigations revealed:

Serum testosterone 4 nmol/l (9-35)

Plasma follicle stimulating hormone (FSH) 1 U/l (1-7)

Plasma luteinising hormone (LH) 1 U/l (1-10)

Plasma prolactin 300 mU/l (<450)

Plasma TSH 2 mU/l (0.5-5)

Which one of the following is the most likely cause?

- 1- Constitutional delay
- 2- Hypopituitarism
- 3- Hypothyroidism
- 4- Kallman's syndrome
- 5- Klinefelter's syndrome

Answer & Comments

Answer: 4- Kallman's syndrome

The low follicle-stimulating hormone (FSH) and luteinising hormone (LH), together with the low testosterone, suggests a hypogonadotrophic hypogonadism.

We know that there is no mental retardation, and we are told that physical examination is normal and sense of smell would usually not be tested.

Consequently a diagnosis of Kallman's is suggested.

We are not told of a family history of growth delay, thus this is unlikely to be constitutional delay.

The thyroid-stimulating hormone (TSH) is normal, making hypothyroidism unlikely and this together with the normal prolactin make hypopituitarism most unlikely.



[Q: 2385] OnExamination 2012 - Endocrinology

Which of the following is a characteristic feature of familial hypercholesterolaemia?

- 1- Autosomal dominant inheritance
- 2- Elevated chylomicrons
- 3- Hypertriglyceridaemia
- 4- Increased expression of LDL receptors
- 5- Palmar xanthomas

Answer & Comments

Answer: 1- Autosomal dominant inheritance

Familial hypercholesterolaemia is an autosomal dominant condition manifest by increased low density lipoprotein (LDL) concentrations (not chylomicrons) due to constitutional abnormalities and reduced numbers of the LDL receptor.

Hypertriglyceridaemia is not characteristic and high density lipoprotein (HDL) concentrations are usually decreased.

Tendon xanthomata are characteristic and the condition is associated with a premature cardiovascular mortality.



[Q: 2386] OnExamination 2012 - Endocrinology

An asymptomatic 56-year-old man with a family history of type 2 diabetes was found to have a fasting venous glucose of 6.5 mmol/l.

Which of the following relating to his further investigation is correct?

- 1- He has impaired glucose tolerance
- 2- He should be investigated further by another fasting venous sampling
- 3- He should be treated with oral hypoglycaemics in the first instance
- 4- He should undergo a 75 gm oral glucose tolerance test
- 5- This does not need further investigation

Answer & Comments

Answer: 4- He should undergo a 75 gm oral glucose tolerance test

According to the new revised criteria for the diagnosis of diabetes, venous plasma glucose (VPG) of 6.1 - 6.9 is categorised as impaired fasting glycaemia and requires further assessment with a 75 gram oral glucose tolerance test (OGT) which is still the gold standard.

A two hour value of equal to or over 11.1 mmol/l is diagnostic of diabetes.

Impaired glucose tolerance is a two hour VPG of 7.8 - 11.1 during an OGT.

Initial treatment of type 2 diabetes is patient education, diet and lifestyle changes.



[Q: 2387] OnExamination 2012 - Endocrinology

Causes of hypoadrenalism include which of the following?

- 1- Hughes' syndrome (antiphospholipid antibody)
- 2- McArdle's syndrome
- 3- MEN type 2a
- 4- Pendred's syndrome
- 5- von Hippel-Lindau

Answer & Comments

Answer: 1- Hughes' syndrome (antiphospholipid antibody)

The antiphospholipid syndrome is one of the more common causes of hypoadrenalism and may precipitate adrenal infarction and haemorrhage through adrenal vein thrombosis.



[Q: 2388] OnExamination 2012 - Endocrinology

A 36-year-old male presents with lethargy. He takes no medication and has generally been otherwise well. Examination reveals that he is obese with a BMI of 36.4 kg/m² and a blood pressure of 120/72 mmHg.

There are no abnormalities of the cardiovascular, respiratory or abdominal systems.

Investigations reveal:

Sodium 141 mmol/l (137-144)

Potassium 2.8 mmol/l (3.5-4.9)

Urea 5.6 mmol/l (2.5-7.5)

Creatinine 76 µmol/l (60-110)

What is the most likely diagnosis?

- 1- Apparent mineralocorticoid excess
- 2- Bartter's syndrome
- 3- Conn's syndrome
- 4- Cushing's syndrome
- 5- Hypokalaemic periodic paralysis

Answer & Comments

Answer: 2- Bartter's syndrome

Bartter's syndrome is a mixed bag of disorders but most frequently characterised by an autosomal recessive condition consisting of juxtaglomerular cell hyperplasia and secondary hyperaldosteronism.

A normal or low blood pressure is typical.

It may present in childhood with weakness and failure to thrive, but may present coincidentally in adulthood.



[Q: 2389] OnExamination 2012 - Endocrinology

A 60-year-old woman diagnosed with giant cell arteritis was commenced on high dose prednisolone therapy.

What is the most appropriate treatment for the prevention of steroid-induced osteoporosis?

- 1- Bisphosphonate therapy
- 2- Calcium and vitamin D
- 3- Hormone replacement therapy (HRT)
- 4- Raloxifene
- 5- Salmon calcitonin

Answer & Comments

Answer: 1- Bisphosphonate therapy

The most appropriate therapy advocated by the National Osteoporosis Society for the prevention of steroid-induced osteoporosis would be bisphosphonate therapy such as Didronel or alendronate.

These are the only class of drug shown to offer osteoprotection with steroid therapy.

Patients taking 7.5 mg or more of prednisolone daily for three months or longer should be offered osteoprotection.

HRT would not really be appropriate for this subject who is ten years past the menopause and likely to be free of all menopausal symptoms.



[Q: 2390] OnExamination 2012 - Endocrinology

Osteomalacia may be expected in which of the following?

- 1- Auto-immune adrenalitis

- 2- Mercury poisoning
- 3- Pernicious anaemia
- 4- Pseudo-hypoparathyroidism
- 5- Sarcoidosis

Answer & Comments

Answer: 2- Mercury poisoning

Osteomalacia may occur with vitamin D deficiency.

Mercury poisoning or any heavy metal poisoning causes an acquired Fanconi syndrome with proximal (type 2) renal tubular acidosis.



[Q: 2391] OnExamination 2012 - Endocrinology

A 21-year-old woman is taking vasopressin replacement after developing cranial diabetes insipidus after a road traffic accident. You are concerned that she may be using excess amounts of vasopressin.

Which of the following is a recognised effect of vasopressin?

- 1- Decreased factor VIII production
- 2- GI smooth muscle relaxation
- 3- Increased coronary artery blood flow
- 4- Increased platelet aggregation
- 5- Uterine smooth muscle relaxation

Answer & Comments

Answer: 4- Increased platelet aggregation

Antidiuretic hormone (ADH) actually leads to increased factor VIII production, and as such may be of utility in treating some patients with haemophilia A.

It leads to uterine and GI smooth muscle contraction and indirectly leads to a reduction in coronary artery blood flow.



[Q: 2392] OnExamination 2012 -
Endocrinology

A 32-year-old man is referred to the clinic with hypertension.

He is currently taking amlodipine, ramipril and bendroflumethiazide but his blood pressure in the clinic is 160/90 mmHg. Clinical examination is unremarkable and a range of investigations are arranged.

Investigations show:

Haemoglobin 11.4 g/dl(13.5-17.7)

White cell count $6.3 \times 10^9/l$ (4-11)

Platelets $193 \times 10^9/l$ (150-400)

Sodium 139 mmol/l (135-146)

Potassium 3.6 mmol/l (3.5-5)

Creatinine 140 micromol/l (79-118)

Ultrasound: Right kidney 6.9 cm, left kidney 10.5 cm.

Which of the following most accurately reflects the likely findings on renin/aldosterone testing?

- 1- Levels are not likely to be linked to any pathology seen here
- 2- Renin and aldosterone will be low
- 3- Renin will be high and aldosterone will be high
- 4- Renin will be high and aldosterone will be low
- 5- Renin will be low and aldosterone will be high

Answer & Comments

Answer: 3- Renin will be high and aldosterone will be high

This man's hypertension is significant, bearing in mind he has elevated blood pressure even after three anti-hypertensive medications.

The differential size on renal ultrasound scan raises the possibility of renal artery stenosis,

which would result in elevated renin and aldosterone levels.

Even in essential hypertension, renin and aldosterone may be elevated. As such the stems suggesting that both will be low, or that the levels are not linked to any pathology here must be incorrect.

Hyporeninaemic hyperaldosteronism is consistent with adrenal hyperplasia or a Conn's adenoma.

Hyperreninaemic hypoaldosteronism is linked to aldosterone deficiency which may be genetic in origin and would not result in hypertension.

It is also important to note that ideally antihypertensives should be stopped prior to measuring renin and aldosterone, if possible safely. In this case the gentleman is still severely hypertensive and therefore the renin and aldosterone are likely to still be raised. The effect of antihypertensives on renin and aldosterone levels (and the renin:aldosterone ratio) is shown below:

Medication Renin Aldosterone Overall Effect

Non-dihydropyridine CCB

(nifedipine, verapamil) Minimal Minimal No effect

Dihydropyridine CCB

(amlodipine) Minimal Decreased

(minimal) No effect

α -blockers Nil Nil No effect

Hydralazine Minimal Minimal No effect

ACE inhibitors Increased Decreased False negative

Diuretics Increased markedly Increased False negative

Minoxidil Increased Minimal False negative

Angiotensin receptor

blockers Increased Decreased False negative
 B-blockers Decreased Minimal False positive
 Methyl dopa Decreased Minimal False positive



[Q: 2393] OnExamination 2012 - Endocrinology

You are reviewing new potential targets for the treatment of type 2 diabetes.

When thinking about targets, which of the following is true?

- 1- GIP has a more potent effect on insulin release than GLP-1
- 2- Glucokinase activators should not cause hypoglycaemia
- 3- Metformin non-response is not usually genetic
- 4- PPAR gamma agonists increase bone mineral density
- 5- TCF7L2 mutations may be associated with a reduced incretin response

Answer & Comments

Answer: 5- TCF7L2 mutations may be associated with a reduced incretin response

Infusion of glucagon-like peptide 1 (GLP-1) leads to a more potent incretin effect than gastric inhibitory polypeptide (GIP), as such it is GLP-1 based therapies that have been the first incretin agents to be developed.

Glucokinase activators may lead to both enhanced insulin release and glycogen storage in the liver, as such they are known to cause hypoglycaemia. No glucokinase activators have yet made it to the clinic.

Mutations in organic cation transporters are known to be associated with differences in metformin response, and peroxisome proliferator activated receptor (PPAR) gamma agonists have been shown to reduce bone mineral density.



[Q: 2394] OnExamination 2012 - Endocrinology

A 26-year-old woman presents with concern about her weight gain and excessive hairiness. She has hair around her nipples and extending up from her groin, and is concerned that it is significantly affecting her self confidence.

She also finds it difficult to control her weight, having increased to over 16 stone in the past two to three years, and has periods only once every three to four months.

On examination she has a BP of 145/85 mmHg, a pulse of 75 and a BMI of 31 kg/m². She has midline hair spreading up to her navel, and around her areolae. She is obese, but otherwise there are no other abnormal findings.

Investigations show

Hb 13.0 g/dl (13.5-18)

WCC 6.0 x 10⁹/L (4-10)

PLT 193 x 10⁹/L (150-400)

Na 140 mmol/l (134-143)

K 4.4 mmol/l (3.5-5)

Gluc 6.1 g/dl (7.0-11.0)

Which of the following investigations would be most useful in supporting an underlying diagnosis of PCOS?

- 1- 17-OH progesterone
- 2- Abdominal ultrasound scan
- 3- LH:FSH ratio
- 4- Oral glucose tolerance test
- 5- Serum testosterone

Answer & Comments

Answer: 2- Abdominal ultrasound scan

Historically, a biochemical diagnosis of polycystic ovary syndrome (PCOS) was considered on the basis of a mild elevation of testosterone, and raised LH:FSH ratio.

It is recognised however that LH:FSH ratio is not always predictive of the presence of polycystic ovaries, so for this reason abdominal ultrasound scan is the investigation of choice.

Weight loss is the management of choice, and metformin has been used both to enhance weight loss and induce ovulation.



[Q: 2395] OnExamination 2012 - Endocrinology

You are visited by a 67-year-old woman who has a history of type 2 diabetes for the past six years, which was initially controlled with lifestyle and exercise, and then metformin 1 g twice daily. Her most recent HbA1c prior to clinic was 8.9%.

On examination she has a blood pressure of 145/89 mmHg, and a BMI of 29. You discuss options with her and come to the decision that insulin initiation would be the best option for her.

According to the ADA/EASD consensus, which of the following is the appropriate starting dose for intermediate acting insulin?

- 1- 0.1 U/kg
- 2- 0.2 U/kg
- 3- 0.7 U/kg
- 4- 1.0 U/kg
- 5- 1.5 U/kg

Answer & Comments

Answer: 2- 0.2 U/kg

0.2 U/kg or a flat dose of 10 U is the recommended starting dose for intermediate acting insulin.

A titration schedule based on fasting glucose levels is then recommended, with an increase of 2 U of insulin every three days until fasting glucose is in the target range of 3.9-7.2 mmol/l.

If the fasting plasma glucose is more than 10 mmol/l, then a more aggressive uptitration schedule of 4 U every three days can be considered.



[Q: 2396] OnExamination 2012 - Endocrinology

A 29-year-old female with Turner syndrome is referred by the GP concerned about her blood pressure which he has found to be persistently elevated at between 140-160/90 mmHg.

On examination she is noted to have a blood pressure of 148/92 mmHg, with no radio-femoral delay and no murmur audible.

Which of the following is the most likely cause of her hypertension?

- 1- Coarctation of the aorta
- 2- Essential hypertension
- 3- Primary hyperaldosteronism
- 4- Renal artery stenosis
- 5- Single horseshoe kidney

Answer & Comments

Answer: 2- Essential hypertension

Hypertension is quite common in Turner syndrome (10%) and is typically idiopathic - essential.

In a small proportion causes can include coarctation of the aorta and renal dysfunction due to horseshoe kidney.

In this case, essential hypertension is the most likely cause, and in the absence of specific features of coarctation this would again be the most appropriate option.



[Q: 2397] OnExamination 2012 - Endocrinology

A 18-year-old girl presents with anxiety and palpitations.

Her mother had been treated for an overactive thyroid gland having received radioiodine and was now on thyroxine replacement therapy.

On examination she had a pulse of 104 bpm with a fine tremor and lid lag. There was no goitre palpable.

Investigations revealed:

Serum Free T₄ 33 pmol/L (10-22)

Plasma thyroid stimulating hormone (TSH) <0.05 (0.4-5)

Serum antithyroid peroxidase (anti TPO) titre 40 U/L (<50)

What is the most likely cause of her symptoms?

- 1- Factitious thyrotoxicosis
- 2- Familial hyperthyroglobulinaemia
- 3- Graves' disease
- 4- Hashitoxicosis
- 5- Riedel's thyroiditis

Answer & Comments

Answer: 3- Graves' disease

Although the lead-in might make you think that this patient could gain access to thyroxine and so a diagnosis of factitious hyperthyroidism is possible, in practice this is extremely unlikely.

A strong family history of thyrotoxicosis is typical for Graves' disease and the absence of a goitre with the absence of TPO antibodies (found in 80% of Graves' cases) again is compatible with a diagnosis of Graves'.



[Q: 2398] OnExamination 2012 - Endocrinology

A 17-year-old female is referred following a visit to the dentist where marked erosion of her teeth was noted. She was entirely asymptomatic and her only medication was the oral contraceptive pill.

On examination her blood pressure was 110/70 mmHg and her body mass index was 21.5 kg/m² (18-25).

Investigations reveal:

Sodium 135 mmol/L(137-144)

Potassium 2.1 mmol/L(3.5-4.9)

Bicarbonate 42 mmol/L(20-28)

Urea 2.6 mmol/L(2.5-7.5)

Corrected Calcium 2.08 mmol/L(2.2-2.6)

Alkaline phosphatase 201 U/L(45-105)

What is the most likely diagnosis?

- 1- Bulimia nervosa
- 2- Conn's syndrome
- 3- Laxative abuse
- 4- Pregnancy
- 5- Primary hypoparathyroidism

Answer & Comments

Answer: 1- Bulimia nervosa

This patient has tooth erosion associated with hypokalaemic metabolic alkalosis and hypocalcaemia. This suggests a diagnosis of bulimia which may cause a mild hypocalcaemia.

Hypoparathyroidism is a possible answer but the alkaline phosphatase would be expected to be normal/low with this condition.

Again tooth erosion and the like is typical of primary hypoparathyroidism.

Conn's is unlikely in this age group, is not associated with tooth erosion and hypertension would be expected.

Laxative abuse would be associated with hypokalaemia but the hypocalcaemia with raised alkaline phosphatase would not be expected.

Early pregnancy would not fit this picture.



[Q: 2399] OnExamination 2012 - Endocrinology

Which of the following has a known association with phenylketonuria?

- 1- Musty odour.
- 2- Normal development.
- 3- Presentation in the second year of life with absence seizures.
- 4- Response of some patients to piridoxine.
- 5- The association of red hair and brown eyes.

Answer & Comments

Answer: 1- Musty odour.

Phenylketonuria is a quarter as common as congenital hypothyroidism, with an incidence of 1:10,000 live births.

It is due either to phenylalanine hydroxylase deficiency or problems with synthesis or recycling of the bipterin co-factor.

The presentation is with infantile spasms or developmental delay between 6 and 12 months of age. Patients may be musty smelling, fair haired and blue eyed and may develop eczema.

Treatment is with restriction of dietary phenylalanine, while ensuring sufficient for physical and neurological growth.

Co-factor defects are treated with a diet low in phenylalanine and high in neurotransmitter precursors.



[Q: 2400] OnExamination 2012 - Endocrinology

Which of the following is not associated with hyponatraemia and hyperkalaemia?

- 1- Acute hypoadrenalism
- 2- Carbenoxolone therapy
- 3- Co-amilofruse therapy
- 4- Congestive cardiac failure.

5- Type IV renal tubular acidosis

Answer & Comments

Answer: 2- Carbenoxolone therapy

Carbenoxolone therapy may be associated with hypokalaemia and salt retention due to pseudohypoaldosteronism through inhibition of the enzyme 11 beta hydroxysteroid dehydrogenase.

Type IV renal tubular acidosis is associated with hyporeninaemic hypoaldosteronism and both hyponatraemia and hyperkalaemia can occur.

Hypoadrenalism is associated with hyperkalaemia and hyponatraemia as is cardiac failure, hepatic and renal failure.

Co-amilofruse the combination of amiloride and furosemide may also produce this biochemical picture.



[Q: 2401] OnExamination 2012 - Endocrinology

Which of the following is a cause of the syndrome of inappropriate ADH secretion?

- 1- Bumetanide
- 2- Carbenoxolone
- 3- Dexamethasone
- 4- Fluoxetine
- 5- Lithium

Answer & Comments

Answer: 4- Fluoxetine

Selective serotonin reuptake inhibitors (SSRIs) are a recognised cause of syndrome of inappropriate antidiuretic hormone (SIADH).

Bumetanide would cause excess renal Na losses.

Carbenoxolone would cause apparent mineralocorticoid excess with hypokalaemia and salt retention as would dexamethasone.

Lithium causes diabetes insipidus.



[Q: 2402] OnExamination 2012 - Endocrinology

You are investigating a range of new agents for the treatment of inflammatory disorders, and are hoping to achieve steroid-like anti-inflammatory efficacy, without some of the known adverse effects.

Which of the following is the most important effect of corticosteroid therapy leading to increased risk of bone fracture?

- 1- Increased bone mineralisation
- 2- Increased osteoblast activity
- 3- Increased osteoblast apoptosis
- 4- Increased osteoclast activity
- 5- Increased osteoclast apoptosis

Answer & Comments

Answer: 3- Increased osteoblast apoptosis

Corticosteroids do not increase bone mineralisation, if anything they impact negatively on bone mineralisation.

They reduce osteoblast activity rather than increasing it.

Whilst corticosteroids do increase osteoclast activity, it is thought to be their effect on osteoblast activity which has a greater impact on bone mineral density.



[Q: 2403] OnExamination 2012 - Endocrinology

A 23-year-old woman presents to the hospital with a third attack of anxiety, abdominal pain and hypertension in the last six months.

On examination in the Emergency department her BP is 150/80 mmHg, pulse is 95 and

regular. She has generalised abdominal pain but her abdomen is soft and she has active bowel sounds.

Investigations show:

Haemoglobin 11.9 g/dl(11.5-16.0)

White cell count $10.9 \times 10^9/L$ (4-11)

Platelets $181 \times 10^9/L$ (150-400)

Sodium 131 mmol/l (135-146)

Potassium 3.9 mmol/l (3.5-5)

Creatinine 88 $\mu\text{mol/l}$ (79-118)

Which of the following is the most likely cause of her hyponatraemia?

- 1- Addison's disease
- 2- Dehydration
- 3- Glomerulonephritis
- 4- Psychogenic polydipsia
- 5- Syndrome of inappropriate ADH

Answer & Comments

Answer: 5- Syndrome of inappropriate ADH

SIADH is associated with acute intermittent porphyria, the most likely diagnosis here. Hyponatraemia may contribute to a worsening of confusion and agitation and even convulsions where the sodium falls precipitously low.

Addison's seems unlikely in the absence of any elevation in potassium and no signs of hypovolaemia.

Similarly both dehydration and psychogenic polydipsia are not appropriate answers because the BP is not low and there are no signs of dehydration, and we have no history of polyuria.

Given that we are not presented with the results of urine testing, glomerulonephritis is not a correct option.



[Q: 2404] OnExamination 2012 - Endocrinology

A 51-year-old man presents with abdominal pain, stiffness and muscle spasms.

You understand that a few days earlier he injured himself when he stabbed a fork through his foot. He cleaned and dressed it himself, but refused to attend the Emergency Department for a check up.

On examination he is pyrexial 37.8°C, his pulse is 95 and his BP is 105/70 mmHg. He has obvious jaw and neck stiffness on examination and his abdominal muscles are held rigid. His left foot is erythematous with signs of local infection.

Investigations show:

Haemoglobin 12.9 g/dl(13.5-17.7)

White cell count 13.6 x 10(9)/l (4-11)

Platelets 180 x 10(9)/l (150-400)

Sodium 137 mmol/l (135-146)

Potassium 3.8 mmol/l (3.5-5)

Creatinine 120 µmol/l (79-118)

Which of the following is the most appropriate next intervention?

- 1- Human tetanus immunoglobulin IV
- 2- Immediate debridement of the wound
- 3- Local application of tetanus toxoid
- 4- Metronidazole IV
- 5- Penicillin IV

Answer & Comments

Answer: 1- Human tetanus immunoglobulin IV

Debridement is incorrect because it should be delayed until a few hours after immunoglobulin has been administered.

Systemic antibiotics are largely disappointing. Whilst penicillin has been the traditional first choice, evidence suggests that where there is sensitivity to metronidazole, this is a better option.

Local application of human tetanus immunoglobulin has no value.



[Q: 2405] OnExamination 2012 - Endocrinology

A 62-year-old man with a 40 year history of type 1 diabetes comes to the renal clinic for review.

He has been referred by his GP because of a deteriorating GFR which has now fallen to 42 ml/min. His BP is actually well controlled at 115/72 mmHg on three oral agents and a recent HbA1c was measured at 7.2% (55 mmol/mol). He has 2+ proteinuria on dipstick testing.

Which of the following most accurately represents the average time his GFR will take to fall below 30 ml/min?

- 1- 1 year
- 2- 3 years
- 3- 5 years
- 4- 7 years
- 5- 9 years

Answer & Comments

Answer: 2- 3 years

Given that the progression of glomerular filtration rate (GFR) in patients with well controlled glucose and BP is established at 4 ml/min/year, all the other options apart from B must be incorrect.

More elevated glucose and BP would be associated with more rapid progression of GFR.



[Q: 2406] OnExamination 2012 - Endocrinology

A 23-year-old man is referred to the clinical pharmacology clinic with resistant hypertension. He is taking maximal ramipril

and amlodipine, yet his blood pressure is raised at 160/95 mmHg.

Further questioning reveals that his father and uncle both suffer from hypertension and have suffered haemorrhagic strokes in the past few years.

General clinical examination is unremarkable.

Investigations show:

Haemoglobin 13.9 g/dl(13.5-17.7)

White cell count $7.0 \times 10^9/L$ (4-11)

Platelets $180 \times 10^9/L$ (150-400)

Sodium 137 mmol/l (135-146)

Potassium 3.2 mmol/l (3.5-5)

Creatinine 110 $\mu\text{mol/l}$ (79-118)

Renal ultrasound scan bilateral normal sized kidneys

He is given a trial of hydrocortisone and his blood pressure falls over a few weeks to 140/82 mmHg.

Which of the following is the most likely diagnosis?

- 1- Adrenal adenoma
- 2- Bilateral adrenal hyperplasia
- 3- Essential hypertension
- 4- Familial glucocorticoid remediable aldosteronism
- 5- Renal artery stenosis

Answer & Comments

Answer: 4- Familial glucocorticoid remediable aldosteronism

An adrenal adenoma or bilateral adrenal hyperplasia should not be responsive to corticosteroid therapy, ruling these out as possible scenarios.

Equally, essential hypertension is highly unlikely given hypokalaemia in the presence of maximal angiotensin-converting enzyme (ACE) inhibitor dose.

Finally, normal kidney size with no differential, and no bruits on clinical examination, whilst not ruling out renal artery stenosis, certainly diminishes the chances of this being the potential problem.



[Q: 2407] OnExamination 2012 - Endocrinology

A 62-year-old man with a history of type 2 diabetes comes to the nephrology clinic for review; he complains of increasing bony aches over the past few months.

His diabetes is managed with gliclazide, and he also takes ramipril, amlodipine, indapamide, atorvastatin and aspirin.

On examination his BP is 155/88 mmHg, his pulse is 82 and regular, his BMI is 29.

Investigations show:

Haemoglobin 10.4 g/dl(11.5-16.5)

White cells $8.4 \times 10^9/L$ (4-11)

Platelet $183 \times 10^9/L$ (150-400)

Sodium 141 mmol/l (135-146)

Potassium 5.3 mmol/l (3.5-5)

Creatinine 187 $\mu\text{mol/l}$ (79-118)

Calcium 2.15 mmol/l (2.20-2.60)

Phosphate 1.9 mmol/l (0.8-1.5)

PTH 14.2 pmol/l (1-6.1)

PTH was 8.5 1 year earlier.

Which of the following is the most likely diagnosis?

- 1- Osteomalacia
- 2- Osteoporosis
- 3- Primary hyperparathyroidism
- 4- Secondary hyperparathyroidism
- 5- Tertiary hyperparathyroidism

Answer & Comments

Answer: 4- Secondary hyperparathyroidism

Phosphate retention and a lack of hydroxylated vitamin D drives increased levels of parathyroid hormone (PTH) as the body strives to retain calcium.

Patients with renal disease however are not treated for hyperparathyroidism until the PTH level breaches twice the upper limit of the normal range.

This is because of the risk of precipitating adynamic bone disease.

Usual first line therapy is weekly 1-alpha-calcidol.

A. Whilst decreased levels of hydroxylated vitamin D drive an increase in PTH, low vitamin D levels are not the primary pathology, so this answer is incorrect.

B. Osteoporosis is incorrect because the bloods we are provided with are consistent with metabolic bone disease.

C. Primary hyperparathyroidism is incorrect because the hyperparathyroidism is driven by chronic renal impairment.

D. Secondary hyperparathyroidism is the correct answer; the raised creatinine, borderline low calcium, raised phosphate are consistent with the condition.

E. Tertiary hyperparathyroidism is incorrect because of the relatively short duration of his bone and joint pains, and as yet uncorrected calcium and phosphate.



[Q: 2408] OnExamination 2012 - Endocrinology

A 33-year-old male with type 1 diabetes presents with a two day history of pain, swelling and redness in his left middle finger. This began after he pricked his finger in the garden whilst pruning a bush.

His diabetic control has been quite reasonable with a HbA1c of 7.1% (3.8-6.4) on basal bolus insulin consisting of Lispro tds and Humulin I in the evenings.

On examination he has a painful, red and swollen middle finger with the redness extending to the metacarpophalangeal joint. He is diagnosed with cellulitis.

What is the most appropriate treatment for this patient?

- 1- Admit to hospital for IV antibiotics
- 2- Oral flucloxacillin only
- 3- Oral metronidazole only
- 4- Oral penicillin V only
- 5- Oral penicillin V and flucloxacillin

Answer & Comments

Answer: 5- Oral penicillin V and flucloxacillin

The patient has digital cellulitis and the most likely organisms responsible are Strep. pyogenes or Staph. aureus.

The most appropriate treatment is penicillin V and flucloxacillin which should result in a rapid improvement.

If there is a deterioration then admission for IV antibiotics may be required but this should be unnecessary with appropriate antibiotic selection.



[Q: 2409] OnExamination 2012 - Endocrinology

A 38-year-old male presents with concerns relating to obesity.

What is the average daily energy used by a male of this age?

- 1- 1500 kcal
- 2- 2000 kcal
- 3- 2500 kcal
- 4- 3000 kcal
- 5- 3500 kcal

Answer & Comments

Answer: 3- 2500 kcal

The average daily energy consumption of a male is 2500 kcal and 2000 kcal for a female.

These values are important when determining the dietary calorie restriction.



[Q: 2410] OnExamination 2012 - Endocrinology

A 32-year-old female presents with a two month history of agitation, menstrual irregularity and weight loss.

Examination reveals a tremor and a palpable goitre with a bruit.

Which of the following would most likely be present in this patient?

- 1- Anti-thyroglobulin antibody
- 2- Thyroid microsomal antibodies
- 3- Thyroid peroxidase antibodies
- 4- TSH receptor inhibiting antibodies
- 5- TSH receptor stimulating antibodies

Answer & Comments

Answer: 5- TSH receptor stimulating antibodies

This patient is most likely to have Graves' disease as revealed by the thyroid bruit.

Thyroid-stimulating hormone (TSH) receptor stimulating antibody is specific for Graves' disease and is present in the vast majority of cases.



[Q: 2411] OnExamination 2012 - Endocrinology

A 64-year-old female is diagnosed with osteoporosis and is receiving treatment with raloxifene.

What is raloxifene?

- 1- A bisphosphonate
- 2- A selective androgen receptor modulator (SARM)

3- A selective oestrogen receptor modulator (SERM)

4- A synthetic oestrogen

5- An androgenic steroid

Answer & Comments

Answer: 3- A selective oestrogen receptor modulator (SERM)

Raloxifene, like tamoxifen is a SERM, with oestrogen-like activity at sites like bone but anti-oestrogen-like effects on breast/endometrium.



[Q: 2412] OnExamination 2012 - Endocrinology

A 37-year-old female presents with galactorrhoea.

She has a history of dyspepsia for which she receives omeprazole.

Examination reveals a BMI of 23.5 kg/m² and a small amount of galactorrhoea to expression.

Investigations show:

Prolactin 850 mU/L (50-500)

Oestradiol 88 pmol/L (130-500)

LH 3.2 mU/L (3.5-8)

FSH 2.8 mU/L (3-8)

What disorder should be considered?

- 1- Addison's disease
- 2- Drug-induced hyperprolactinaemia
- 3- Hyperthyroidism
- 4- Hypothyroidism
- 5- MEN type 1

Answer & Comments

Answer: 5- MEN type 1

The presence of hyperprolactinaemia with hypogonadotrophic hypogonadism suggests a diagnosis of a microprolactinoma and in combination with the recurrent dyspepsia a

diagnosis of multiple endocrine neoplasia (MEN) type 1 should be considered.

All the findings cannot be explained by omeprazole for which there are some case reports only of hyperprolactinaemia.

Addison's disease does not cause hyperprolactinaemia and neither hypothyroidism nor hyperthyroidism would fit this clinical scenario.



[Q: 2413] OnExamination 2012 - Endocrinology

A 23-year old woman with a history of type 1 diabetes, hypothyroidism and coeliac disease comes to the clinic complaining of increased tiredness and lethargy over the course of the past few months.

She is generally compliant with her insulin, thyroid medication and coeliac diet.

On examination her BP is 115/72 mmHg, pulse is 62 and regular, her BMI is 21. Apart from looking pale, her general physical examination is unremarkable.

Investigations show:

Haemoglobin 10.4 g/dl(11.5-16.0)

MCV 105 fL(80-96)

White cell count $5.1 \times 10^9/L$ (4-11)

Platelets $158 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 3.7 mmol/l (3.5-5)

Creatinine 110 micromol/l (79-118)

HbA1c 7.4%(<5.5)

Which of the following is the most likely diagnosis?

- 1- Addison's disease
- 2- Pernicious anaemia
- 3- Poor compliance with coeliac diet
- 4- Poor compliance with thyroid hormone replacement
- 5- Thyroid hormone resistance

Answer & Comments

Answer: 2- Pernicious anaemia

Given this patient is already suffering from three autoimmune conditions it is quite possible for her to acquire a fourth.

The picture of tiredness and lethargy, with a raised mean corpuscular volume (MCV) anaemia against a background of well controlled diabetes fits well with this. Her relatively good HbA1c gives us no reason to suspect poor compliance either with her insulin, coeliac diet or her thyroid medication.

Her electrolytes which are in the normal range make Addison's unlikely.

If she were poorly compliant with coeliac diet or thyroid hormone replacement, we would expect poor compliance with diabetes therapies and we have no evidence of that.

Thyroid hormone resistance would be associated with weight gain and symptoms of hypothyroidism.



[Q: 2414] OnExamination 2012 - Endocrinology

A 17-year-old woman presents with symptoms of severe lethargy and depression. According to her mother she eats minimal amounts and she suspects that her daughter is vomiting to reduce her calorie intake.

On examination her BMI is 16.5. She looks emaciated and there are scars on her knuckles consistent with induced vomiting. She has fine hairs covering her arms and legs.

Which of the following would you most expect to find on laboratory screening?

- 1- Decreased cortisol
- 2- Decreased potassium
- 3- Decreased TSH
- 4- Elevated sodium
- 5- Elevated TSH

Answer & Comments

Answer: 2- Decreased potassium

Cortisol levels if anything are increased, consistent with a stress response.

Thyroid-stimulating hormone (TSH) levels are not affected by anorexia and elevated sodium would only be expected in circumstances of severe dehydration.



[Q: 2415] OnExamination 2012 - Endocrinology

A 45-year-old man presents with joint pains and a flu-like illness a few weeks after returning from a walking holiday in the Austrian alps. He feels absolutely wretched and is unable to work because of fatigue.

On examination he is pyrexial 37.6°C, his pulse is 75 and his BP is 125/70 mmHg. He has arthralgia with limitation of movement affecting both knees and elbows. There is a circular rash on his left lower leg, he tells you he does not know how he got it.

Investigations show:

Haemoglobin 12.8 g/dl(13.5-17.7)

White cell count $10.9 \times 10^9/L$ (4-11)

Platelets $125 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 3.9 mmol/l (3.5-5)

Creatinine 110 $\mu\text{mol/l}$ (79-118)

ESR 65 mm/hr(<10)

ALT 180 U/l (5-40)

Which of the following is the most likely diagnosis?

- 1- CMV infection
- 2- Hepatitis B
- 3- Lyme disease
- 4- Reactive arthritis
- 5- Rheumatoid arthritis

Answer & Comments

Answer: 3- Lyme disease

The raised alanine aminotransferase (ALT) may be indicative of a hepatic picture, but there is no pharyngitis to suggest a link to cytomegalovirus (CMV), nor is there any history of possible blood-borne transfer of hepatitis B.

Reactive arthritis follows either gastrointestinal or sexually transmitted infection, and the acute picture, coupled with features suggestive of infection, would not fit exactly with a diagnosis of rheumatoid.



[Q: 2416] OnExamination 2012 - Endocrinology

A 42-year-old man presents with severe hypertension and headaches. An adrenal tumour is identified on ultrasound scan and you are suspicious that this is a pheochromocytoma.

On further questioning it transpires his father died at an early age, and that his sister presented in a similar way with hypertension and was found to have an underlying tumour. You suspect MEN-2.

Which of the manifestations of MEN-2 has the most malignant potential?

- 1- C cell hyperplasia
- 2- Mucosal neuromas
- 3- Parathyroid hyperplasia
- 4- Pheochromocytoma
- 5- Renal disease

Answer & Comments

Answer: 1- C cell hyperplasia

Renal disease in multiple endocrine neoplasia type 2 (MEN-2) is characterised by stone, rather than tumour formation.

Mucosal neuromas and pheochromocytomas are generally not malignant, and parathyroid

hyperplasia, rather than adenoma formation tends to occur.



[Q: 2417] OnExamination 2012 - Endocrinology

A 64-year-old woman is taking long term amiodarone therapy for the management of paroxysmal atrial fibrillation.

She reports that over the past few months she has had mental slowing, weight gain and hair loss.

On examination her BP is 139/80 mmHg, her pulse is 48, and her BMI is 30. She has obviously thinning, dry hair. You measure her TSH which is elevated at 12 IU/l (0.5-4.5).

Which of the following is the most likely pathophysiological explanation for her hypothyroidism?

- 1- Desethylamiodarone driven inhibition of T3
- 2- Inhibition of type 1 5-deiodinase activity in peripheral tissues
- 3- Inhibition of type 2 5-deiodinase activity in the pituitary
- 4- Inhibition of T3 uptake into peripheral tissues
- 5- Iodine driven inhibition of thyroid hormone synthesis

Answer & Comments

Answer: 5- Iodine driven inhibition of thyroid hormone synthesis

Options A and B are known to precipitate an increase in thyroid hormone levels. A rise of between 20% and 40% is seen in patients between one and four months after starting amiodarone therapy.

As this may not necessarily constitute the development of thyrotoxicosis, treatment is not usually indicated without clinical symptoms of hyperthyroidism.

Inhibition of the entry of tri-iodothyronine (T3) into peripheral tissues also leads to a rise in thyroid hormones during the first few months after treatment.

Inhibition of type 2 5-deiodinase activity leads to a rise in thyroid-stimulating hormone (TSH) during the first one to two months after starting amiodarone, but levels usually return to normal about three to four months after starting therapy, and no intervention is required.



[Q: 2418] OnExamination 2012 - Endocrinology

Whilst hospitalised after a hip replacement, a patient with acute intermittent porphyria has a tonic clonic seizure. The seizure was thought to have been due to alcohol withdrawal. The patient required large amounts of analgesia. Six days post-operatively she suffers a porphyric attack.

Which of the following drugs on her prescription is likely to have been responsible?

- 1- Aspirin
- 2- Augmentin
- 3- Oramorph
- 4- Paracetamol
- 5- Sodium valproate

Answer & Comments

Answer: 5- Sodium valproate

AIP is an autosomal dominant disease resulting from defects in production or activity of the enzyme porphobilinogen (PBG) deaminase. Attacks may be precipitated by fasting, and by many drugs, such as phenobarbitone, alcohol, sulphonylureas and oestrogens. Amoxicillin and opiates are thought to be safe in porphyria.

More reading



[Q: 2419] OnExamination 2012 - Endocrinology

A 35-year-old woman with a five year history of treated hypothyroidism presented following an episode of vomiting and collapse. There was a short history of weight loss.

On examination she had a temperature of 37.7°C, a blood pressure of 80/40 mmHg and vitiligo.

Which one of the following, given intravenously, would be the most appropriate initial management?

- 1- 10% dextrose infusion
- 2- Cefotaxime
- 3- Fludrocortisone
- 4- Hydrocortisone
- 5- Tri-iodothyronine

Answer & Comments

Answer: 4- Hydrocortisone

This patient is likely to have Addison's disease based upon her history, autoimmune disease, and presentation.

She requires treatment with intravenous hydrocortisone which can be a lifesaving manoeuvre in acute hypoadrenalism.



[Q: 2420] OnExamination 2012 - Endocrinology

A 20-year-old man with asthma was found to be hypertensive.

Investigations revealed:

Serum Sodium 144 mmol/L (137-144)

Serum potassium 2.4 mmol/L (3.5-4.9)

Serum bicarbonate 30 mmol/L (20-28).

Which one of the following is the most likely diagnosis?

- 1- Bartter's syndrome
- 2- Coarctation of the aorta

- 3- Congenital adrenal hyperplasia
- 4- Conn's syndrome
- 5- Inhaled salbutamol therapy

Answer & Comments

Answer: 4- Conn's syndrome

This is a tough question as a number of answers are possible.

This young asthmatic has a hypokalaemic hypertension and it is assumed that his hypertension is sustained.

This would therefore suggest a secondary cause which may be either hyperaldosteronism or pseudohyperaldosteronism.

A rare CAH (11-beta hydroxysteroid dehydrogenase [11-BHSD] deficiency) may be responsible for hypokalaemic hypertension and the presentation is variable ranging from birth to adulthood but typically birth.

Bartter's syndrome is not associated with hypertension.

Conn's syndrome is usually found in middle aged patients and would be unusual in a patient of this age but even so is probably the best answer here.

Liquorice ingestion could fit this picture but would again be somewhat unusual in this patient.

Salbutamol may cause hypokalaemia particularly when given via nebuliser or particularly intravenously but should not produce hypertension.



[Q: 2421] OnExamination 2012 - Endocrinology

Which of the following is true of IGF-1 concentrations?

- 1- Concentrations are elevated in diabetes mellitus

- 2- Concentrations are elevated in hepatic cirrhosis
- 3- Concentrations are reduced in pregnancy
- 4- Concentrations are reduced in starvation
- 5- Concentrations are usually elevated in adult growth hormone deficiency (GHD)

Answer & Comments

Answer: 4- Concentrations are reduced in starvation

IGF-1 concentrations are often increased in pregnancy.

Reduced IGF-1 is typically found in adult GHD.

Reduced synthesis can be due to cirrhosis of the liver, diabetes mellitus or starvation.



[Q: 2422] OnExamination 2012 - Endocrinology

Which of the following is correct regarding the peroxisome proliferator activated receptor gamma (PPAR gamma)?

- 1- Is a G-protein coupled receptor
- 2- Is a member of the cytokine receptor superfamily
- 3- Is activated by free fatty acid as the endogenous ligand
- 4- Is antagonised by low density lipoprotein (LDL).
- 5- Is antagonised by thiazolidinediones

Answer & Comments

Answer: 3- Is activated by free fatty acid as the endogenous ligand

PPAR gamma is an intracellular receptor that is activated by free fatty acids (which are the natural endogenous ligands) and the thiazolidinediones such as pioglitazone.

On ligand binding it associates with the retinoid X receptor and couples with DNA

producing downstream gene activation with protein synthesis that controls adipocyte differentiation and function and is also related to cellular anti-inflammatory effects.

Two licensed medications existed in the thiazolidinedione class, rosiglitazone and pioglitazone, but rosiglitazone has been suspended from the European market due to concerns about its benefit:risk ratio.



[Q: 2423] OnExamination 2012 - Endocrinology

Which of the following techniques would be most useful in the differential diagnosis between ectopic Cushing's syndrome and pituitary dependent Cushing's disease?

- 1- ACTH concentrations
- 2- CRF test
- 3- High dose dexamethasone suppression test
- 4- Inferior petrosal sinus sampling
- 5- Urine free cortisol

Answer & Comments

Answer: 4- Inferior petrosal sinus sampling

Inferior petrosal sinus sampling with an elevated central adrenocorticotrophic hormone (ACTH) concentration compared with the peripheral value is the most valuable test in the differential diagnosis of either Cushing's disease or ectopic Cushing's syndrome.

The other tests are far less useful in comparison.



[Q: 2424] OnExamination 2012 - Endocrinology

A 33-year-old woman with a history of Graves' disease is referred for thyroidectomy as she has young children, plans further additions to her family and therefore does not want radioiodine therapy.

You are counselling her as to the risks of surgery.

Which of the following is the most likely post-operative complication?

- 1- Bleeding
- 2- Infection
- 3- Recurrent laryngeal nerve palsy
- 4- Superior laryngeal nerve palsy
- 5- Transient hypoparathyroidism

Answer & Comments

Answer: 5- Transient hypoparathyroidism

Infection is seen in 1-2% of patients undergoing thyroidectomy.

Bleeding is less common, seen in around 0.5% or less of patients undergoing the operation. Bleeding risks have fallen significantly due to improvements in surgical technique.

Permanent recurrent laryngeal nerve palsy occurs in 1% of patients; superior laryngeal nerve palsy affects more patients (3-4% in case series).



[Q: 2425] OnExamination 2012 - Endocrinology

A 45-year-old woman comes to the clinic for review.

She takes long term risperidone for schizophrenia. There is also a history of hypertension for which she takes bendroflumethiazide, ramipril and amlodipine. She also uses ranitidine for gastro-oesophageal reflux disease.

On examination her BP is 155/92 mmHg, her pulse is 68 and regular. Her BMI is 33. Unfortunately a fasting plasma glucose is elevated, measured at 9.2 mmol/l.

Which of the following agents is most likely to have contributed to her presentation with diabetes?

- 1- Amlodipine

- 2- Bendroflumethiazide

- 3- Ramipril

- 4- Ranitidine

- 5- Risperidone

Answer & Comments

Answer: 5- Risperidone

Both typical antipsychotics and antihypertensives, (thiazides and beta blockers), have been shown in meta-analyses to be associated with impaired glucose tolerance and increased risk of type 2 diabetes.

The risk is relatively larger for risperidone than thiazides however, so it is risperidone which is the correct answer here.

One epidemiology study suggested a relative risk for development of diabetes of 1.6, versus controls not taking risperidone.

Amlodipine, ramipril and ranitidine are not thought to be associated with increased risk of impaired glucose tolerance or type 2 diabetes.

Bendroflumethiazide and atenolol were shown in a meta-analysis of blood pressure lowering to be associated with impaired glucose tolerance, although on an individual patient basis, this risk is less than that for risperidone.



[Q: 2426] OnExamination 2012 - Endocrinology

A 70-year-old woman is referred by her GP with a breast lump.

She was asymptomatic but her investigations reveal:

Corrected Calcium 2.72 mmol/L(2.2-2.6)

Phosphate 0.80 mmol/L(0.8-1.4)

Alkaline phosphatase 110 U/L(45-105)

PTH concentration 5.1 pmol/L(0.9-5.4)

What is the most likely diagnosis?

- 1- Bony metastases
- 2- Chronic vitamin D excess
- 3- Ectopic PTH related peptide (PTHrp) secretion
- 4- Multiple myeloma
- 5- Primary hyperparathyroidism

Answer & Comments

Answer: 5- Primary hyperparathyroidism

This patient has hypercalcaemia with a borderline low phosphate concentration but an inappropriately normal parathyroid hormone (PTH) concentration.

In primary hyperparathyroidism the PTH may be normal or high because the feedback loop in which calcium drives down PTH production is lost.

This suggests hyperparathyroidism, which is a relatively common disorder amongst elderly females.

The story of the breast lump in this case is endeavouring to mislead the candidate.

Vitamin D excess would be expected to cause an elevated phosphate.



[Q: 2427] OnExamination 2012 - Endocrinology

A 47-year-old female of Asian origin presents with a long history of deteriorating weakness and fatigue. Of late, she has difficulty ascending stairs at home and needs to crawl up them.

She has a six year history of type 2 diabetes mellitus and is treated with metformin and gliclazide. Initial x rays reveal healing clavicular fractures, and a superior pubic rami fracture.

Her investigations show:

Calcium 2.2 mmol/l (2.2-2.5)

Phosphate 0.7 mmol/l (0.8-1.5)

Alkaline phosphatase 212 U/L(50-110)

AST 30 U/L(5-40)

Urea 12 mmol/l (3-8)

Creatinine 67 mol/l (50-100)

HbA1c 11.0%(4-6%)

What is the likely diagnosis?

- 1- Advanced diabetic renal disease
- 2- Diabetic amyotrophy
- 3- Hypoparathyroidism
- 4- Osteoporosis
- 5- Vitamin D deficiency

Answer & Comments

Answer: 5- Vitamin D deficiency

This patient has vitamin D deficiency.

It classically presents in the female Asian population whose clothing offers little exposure to sunlight. The phosphate and calcium are usually low normal, and the alkaline phosphatase is high.

Bone deformity or rickets may develop in children. Fractures can occur due to bone demineralisation with osteoporosis on DEXA.

Proximal myopathy is often a presenting feature of osteomalacia as is probably the case with this patient.



[Q: 2428] OnExamination 2012 - Endocrinology

A 21-year-old male is referred to the endocrine clinic with poorly developed secondary sexual characteristics. The only relevant finding on history is that he has a very poor sense of smell.

On examination he has no axillary or pubertal hair, a 3 cm penis and testicular volumes of approximately 5 ml bilaterally. Smell test reveals that he is unable to distinguish acetone and coffee.

Investigations reveal:

Testosterone 4 nmol/l (10-30)

Prolactin 380 mU/l (<450)

FSH 2.1 IU/l (1-7)

LH 1.5 IU/l (1-10)

What is the most likely diagnosis?

- 1- 5-alpha reductase deficiency
- 2- Craniopharyngioma
- 3- Kallman's syndrome
- 4- Klinefelter's syndrome
- 5- Microdeletion of the Y chromosome

Answer & Comments

Answer: 3- Kallman's syndrome

This patient has evidence of hypogonadotrophic hypogonadism with a low testosterone and a low follicle-stimulating hormone (FSH) and luteinising hormone (LH). In this case, there is isolated gonadotrophic deficiency as evidenced by a normal prolactin. This is seen in Kallman's syndrome, which is often associated with anosmia.

In Klinefelter's syndrome an elevated LH/FSH would be expected, as this is due to testicular failure as would be the case in 5-alpha reductase deficiency.

Craniopharyngioma is a possibility as it does cause hypogonadotrophic hypogonadism but abnormalities in sense of smell would not be expected.



[Q: 2429] OnExamination 2012 - Endocrinology

Which of the following hormones acts through cyclic AMP as the second messenger?

- 1- Insulin
- 2- Oestradiol
- 3- PTH
- 4- TRH

5- Triiodothyronine

Answer & Comments

Answer: 3- PTH

Unlike steroids (progesterone, testosterone, oestradiol and cortisol) other ionic hormones such as:

Adrenaline

Growth hormone-releasing hormone (GHRH)

Glucagon

Luteinising hormone (LH)

Follicle stimulating hormone (FSH)

Parathyroid hormone (PTH)

Thyroid-stimulating hormone (TSH)

are unable to pass the plasma membrane acting upon cell surface receptors and then through cyclic adenosine monophosphate (cAMP) as the second messenger.

Insulin acts through mitogen-activated protein (MAP) kinase pathway, as does growth hormone (GH) and prolactin.

Thyroid releasing hormone (TRH)

Gonadotrophin-releasing hormone (GnRH)

Antidiuretic hormone (ADH)

act through calcium/phosphoinositide.

Nitric oxide and atrial natriuretic peptide (ANP) act through cyclic guanosine monophosphate (cGMP).

Triiodothyronine (T3) acts by binding to intracellular receptors.



[Q: 2430] OnExamination 2012 - Endocrinology

A 60-year-old woman with a two year history of diet-controlled type 2 diabetes was admitted with an acute myocardial infarction (MI). She received thrombolysis together with

an insulin infusion and has done well. Discharge medication includes ramipril and furosemide for mild biventricular failure post infarct.

Investigations revealed a fasting glucose of 12 mmol/l (3.0-6.0) together with a cholesterol of 6.6 mmol/l (<5.2). Her HbA1c was 7.6%.

Which of the following is the most appropriate treatment for her subsequent glycaemic control?

- 1- Continue diet alone
- 2- Gliclazide modified release
- 3- Metformin
- 4- Pioglitazone
- 5- Subcutaneous insulin

Answer & Comments

Answer: 5- Subcutaneous insulin

Following DIGAMI 1 study it was assumed that three months of insulin was appropriate post-MI.

However, DIGAMI 2, which specifically looked at mortality, found no differences between control with oral hypoglycaemic agents (OHAs), insulin or routine metabolic management.

Her mild cardiac failure would count against use of pioglitazone.

In the BNF, metformin is listed as contraindicated within six weeks of MI. Therefore, in this patient we should aim for tighter glycaemic control and probably subcutaneous insulin would be most appropriate here in the first instance, with an early review of glycaemic control at six weeks.

The option then would be to switch to metformin.



[Q: 2431] OnExamination 2012 - Endocrinology

A 51-year-old man is found to have bilateral

breast enlargement.

He says that this is normal for him and that he has not noted any change in years. He shaves infrequently and has scant pubic hair.

Which of the following is most likely to be present?

- 1- 47, XXY karyotype
- 2- History of antidepressant drug therapy
- 3- Increased risk for breast carcinoma
- 4- Increased testosterone levels
- 5- Seminoma of the testis

Answer & Comments

Answer: 1- 47, XXY karyotype

Gynaecomastia is common with Klinefelter's syndrome.

Male breast cancer is rare and is more often associated with advanced age.

There is an association between gynaecomastia and some functioning testicular tumours such as Leydig cell tumours (or rarely, Sertoli cell tumours).

Gynaecomastia is related to conditions of high oestrogens, and one of the most common causes for this is cirrhosis of the liver in chronic alcoholics.



[Q: 2432] OnExamination 2012 - Endocrinology

A previously fit 47-year-old male presents with lower back pain from a vertebral collapse due to osteoporosis.

Which of the following investigations would be the most appropriate for this man?

- 1- Oestrogen concentration
- 2- Prolactin concentration
- 3- Prostate-specific antigen concentration
- 4- Testosterone concentration
- 5- Thyroid function tests

Answer & Comments

Answer: 4- Testosterone concentration

Osteoporosis in a young male would be unusual.

Any symptoms or features of hypogonadism or hypercalcaemia should be elicited.

Hyperprolactinaemia causes hypogonadism so a testosterone concentration would be far more relevant.

Hyperthyroidism would need to be present for a considerable length of time before producing osteoporosis.

Hypogonadism often goes unnoticed.

Prostate malignancy does not cause osteoporosis.



[Q: 2433] OnExamination 2012 - Endocrinology

In randomised clinical studies which of the following is correct regarding post-menopausal hormone replacement therapy (HRT)?

- 1- Causes regression of coronary plaques.
- 2- Increases plasma LDL concentrations.
- 3- Increases plasma triglycerides
- 4- Reduces cardiovascular mortality.
- 5- Reduces the incidence of stroke

Answer & Comments

Answer: 3- Increases plasma triglycerides

In randomised controlled trials (RCTs), HRT has not been shown to reduce cardiovascular (CV) mortality or the incidence of stroke (heart [o]estrogen replacement study - HERS), nor does it cause regression of coronary plaques ([o]estrogen replacement and angiography study - ERA).

In fact HRT has been shown to have an increased CV morbidity in the WHI study.

It does not produce a raised low density lipoprotein (LDL) but may increase high density lipoprotein (HDL) concentrations. Similarly it frequently produces a rise in triglyceride concentrations.



[Q: 2434] OnExamination 2012 - Endocrinology

Adult growth hormone deficiency (GHD) is confirmed by which of the following?

- 1- A low IGF-1 concentration
- 2- A low IGF binding protein-3 (IGFBP3) concentration
- 3- A peak growth hormone concentration of 6 mU/l (2 microg/l) with insulin-induced hypoglycaemia
- 4- An undetectable random growth hormone concentration.
- 5- Suppression of GH below 2 mU/l (1.3 microg/l) with an oral glucose tolerance test

Answer & Comments

Answer: 3- A peak growth hormone concentration of 6 mU/l (2 microg/l) with insulin-induced hypoglycaemia

The diagnosis of adult GHD depends on a peak GH response of less than 9 mU/l to insulin-induced hypoglycaemia.



[Q: 2435] OnExamination 2012 - Endocrinology

A 54-year-old woman comes to visit her daughter who is a student in London. She currently lives in central Africa and has had problems with lethargy and tiredness for some time.

On examination in the clinic her BP is 145/89 mmHg, pulse is 62 and regular. She has a large diffuse goitre on examination of her neck.

Investigations show:

Haemoglobin 12.0 g/dl(11.5-16.0)

White cell count $7.1 \times 10^9/L$ (4-11)

Platelets $207 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 4.1 mmol/l (3.5-5)

Creatinine 112 $\mu\text{mol/l}$ (79-118)

TSH 12 IU/l (0.5-4.5)

Which of the following is the most likely diagnosis?

- 1- Graves' disease
- 2- Hashimoto's thyroiditis
- 3- Iodine deficiency
- 4- Non-toxic multinodular goitre
- 5- Toxic multinodular goitre

Answer & Comments

Answer: 3- Iodine deficiency

Graves' disease is associated with thyrotoxicosis.

Hashimoto's would have been an alternative diagnosis, but the history of inhabiting central Africa is the pointer to iodine deficiency.

Toxic multinodular goitre is associated with thyrotoxicosis, and the fact she is hypothyroid rules out non-toxic multinodular goitre.



[Q: 2436] OnExamination 2012 - Endocrinology

A 51-year-old man with hypertension, morbid obesity and type 2 diabetes is diagnosed with pituitary-dependent Cushing's.

He is managed with three antihypertensives, metformin and gliclazide, yet his pre-operative BP is elevated at 175/100 mmHg, his BMI is 32 and his fasting glucose is 11.2 mmol/l.

Which of the following is most appropriate to improve his metabolic parameters prior to surgery?

- 1- Insulin

2- Metyrapone

3- Mitotane

4- Octreotide

5- Somatotrophin

Answer & Comments

Answer: 2- Metyrapone

Insulin may be an option to improve glycaemic control pre-surgery but it is likely to result in further weight gain and may therefore exacerbate hypertension.

Mitotane has a more delayed onset of action and as such it is less appropriate for pre-surgical use.

Cushing's has no response to octreotide in the majority of patients and somatotrophin, growth hormone, has no value.



[Q: 2437] OnExamination 2012 - Endocrinology

A 32-year-old woman with a history of type 1 diabetes for many years comes to the clinic with rapidly worsening lethargy and nausea.

She takes a basal bolus insulin regime and her most recent HbA1c demonstrated good control.

On examination she looks tanned, her BP is 95/60 mmHg. Her BMI is 19.

Investigations show:

Haemoglobin 11.0 g/dl (11.5-16.5)

White cell count $6.9 \times 10^9/L$ (4-11)

Platelets $162 \times 10^9/L$ (150-400)

Sodium 128 mmol/l (135-146)

Potassium 4.5 mmol/l (3.5-5)

Creatinine 145 $\mu\text{mol/l}$ (79-118)

Urea 8.2 mmol/l (2.5-6.7)

Glucose 5.9 mmol/l (<7.0)

Morning cortisol 100 nmol/l (>140)

Which of the following is true of her underlying condition?

- 1- 75% of patients have circulating anti-adrenal antibodies
- 2- Fludrocortisone replacement is guided by serum electrolytes and postural blood pressure
- 3- It is likely to be related to pituitary failure
- 4- Pernicious anaemia occurs less commonly in patients with this diagnosis
- 5- Two-thirds of hydrocortisone replacement should be taken in the evening

Answer & Comments

Answer: 2- Fludrocortisone replacement is guided by serum electrolytes and postural blood pressure

Replacement of hydrocortisone is skewed so that 2/3rds of the dose is given in the morning with 1/3rd given in the evening.

Given that increased skin colouration is related to high circulating levels of adrenocorticotrophic hormone (ACTH), autoimmune adrenal failure is the most likely cause. Autoimmune adrenal failure is a primary T cell disease, although 50% of patients have circulating anti-adrenal antibodies.

Other autoimmune conditions such as pernicious anaemia and thyroid disease occur more commonly in association with Addison's.



[Q: 2438] OnExamination 2012 - Endocrinology

A 46-year-old man presents passing 4-5 litres of urine per day after commencing a new drug.

Tests show:

Serum Sodium 142 mmol/l (137-144)

Plasma osmolality 295 mosmol/l (275-290)

Urine osmolality 280 mosmol/l (350-1000)

What drug was prescribed?

- 1- Carbamazepine
- 2- Chlorpropamide
- 3- Fluoxetine
- 4- Furosemide
- 5- Lithium

Answer & Comments

Answer: 5- Lithium

The patient appears to have a drug-induced diabetes insipidus based upon the high urine output, low urine osmolality and the high plasma osmolality.

The most likely cause is lithium.

Chlorpropamide causes a SIADH as does carbamazepine and fluoxetine.

Furosemide is another possibility but if it had dried the patient out the plasma sodium would be expected to be higher.

It is most likely that the patient has started lithium for a psychiatric disorder.

A 46-year-old man would be unlikely to be receiving high doses of furosemide.



[Q: 2439] OnExamination 2012 - Endocrinology

A 62-year-old female with a six year history of type 2 diabetes attends for annual review.

Her HbA1c is 10% (3.8-6.4).

Into what average plasma glucose concentration does her HbA1c translate?

- 1- 7.5 mmol/l
- 2- 10 mmol/l
- 3- 12.5 mmol/l
- 4- 15.5 mmol/l
- 5- 19 mmol/l

Answer & Comments

Answer: 4- 15.5 mmol/l

The HbA1c is an important reflection of control over a three month period (life expectancy of the erythrocyte).

There is a good relationship between the rise in glucose and its ability to glycosylate the Hb molecule (there is a difference between average plasma glucose and blood glucose).

Thus a HbA1c of 7% would translate into an average plasma (higher than value of blood glucose) glucose of 9.5 mmol/l and a HbA1c of 10% into 15.5 mmol/l.

This is the reason why so much emphasis is placed on controlling HbA1c rather than the specific glucose measurements, as these vary so much throughout the day.

This is a difficult question and it is very unlikely that you would be asked to translate average blood glucose into an exact HbA1c figure without being provided with a conversion calculator; however, the learning point here is that you realise that the numerical values are not the same.



[Q: 2440] OnExamination 2012 - Endocrinology

Which of the following is true of radioactive iodine (¹³¹I) therapy?

- 1- Causes hypothyroidism in 90% of treated patients within three months
- 2- Causes a deterioration in ophthalmopathy in patients with Graves' disease
- 3- Is associated with a subsequently increased risk of infertility
- 4- Is associated with an increased risk of thyroid lymphoma
- 5- Is the preferred treatment in amiodarone induced thyrotoxicosis

Answer & Comments

Answer: 2- Causes a deterioration in ophthalmopathy in patients with Graves' disease

RAI is associated with the induction of hypothyroidism in the majority of subjects by three months (70%) with 10% failing at the first dose at about 18 months.

It may precipitate deterioration in ophthalmopathy in patients with Graves'.

There is no evidence of either increased risk of infertility or lymphoma after RAI with evidence suggesting that it is quite safe.

Withdrawing amiodarone is the preferred treatment in amiodarone induced thyrotoxicosis and often the iodine uptake would be low in these patients making ¹³¹I therapy unhelpful.



[Q: 2441] OnExamination 2012 - Endocrinology

A 50-year-old man presents with a diagnosis of acromegaly but has normal visual fields.

Which of the following is the most appropriate treatment for this patient?

- 1- Bromocriptine
- 2- Cabergoline
- 3- Radiotherapy
- 4- Somatostatin analogue therapy
- 5- Trans-sphenoidal hypophysectomy

Answer & Comments

Answer: 5- Trans-sphenoidal hypophysectomy

The most appropriate treatment for acromegaly in this middle aged man which may prove curative is surgery.

Somatostatin therapy, although frequently effective in reducing growth hormone (GH), would not be advocated in a young patient who would require lifelong therapy.



[Q: 2442] OnExamination 2012 - Endocrinology

Which of the following may be responsible for a hypokalaemic hypertension?

- 1- Bartter's syndrome
- 2- Diabetic nephropathy
- 3- Liddle's syndrome
- 4- Non-classical congenital adrenal hyperplasia
- 5- Type IV renal tubular acidosis (RTA)

Answer & Comments

Answer: 3- Liddle's syndrome

Liddle's syndrome is typically associated with hypokalaemic hypertension and low renin and aldosterone concentrations - the so-called pseudo-hyperaldosteronism.

Bartter's syndrome is associated with hypokalaemia, though hypertension is not a feature.

In type IV RTA, there is a hyporeninaemic hypoaldosteronism, which may also be produced with diabetic nephropathy, hence hyperkalaemia is more typical.



[Q: 2443] OnExamination 2012 - Endocrinology

Which of the following is true concerning testosterone?

- 1- Acts via cell surface receptors
- 2- Acts via G protein second messengers
- 3- In the circulation is mostly bound to albumin
- 4- Is a steroid hormone
- 5- Is manufactured through the breakdown of oestradiol

Answer & Comments

Answer: 4- Is a steroid hormone

Testosterone is a steroid hormone receptor and can be converted to oestradiol.

It binds to intracellular receptors and is mostly bound to sex-hormone binding globulin.



[Q: 2444] OnExamination 2012 - Endocrinology

A patient is receiving treatment with recombinant human growth hormone (GH).

Which of the following is a recognised side effect of GH therapy?

- 1- Benign intra-cranial hypertension (BIH)
- 2- Melanoma
- 3- Osteoporosis
- 4- Prolongation of the QT interval
- 5- Prostatic hypertrophy

Answer & Comments

Answer: 1- Benign intra-cranial hypertension (BIH)

GH is rarely associated with BIH, the mechanism probably is related to fluid retention.

The commonest side effect of GH therapy is fluid retention, though other side effects include gynaecomastia, hypertension and atrial fibrillation.

Benign prostatic hyperplasia (BPH) has not been reported.



[Q: 2445] OnExamination 2012 - Endocrinology

A 22-year-old woman presented with hirsutism and oligomenorrhea for the last five years.

She is an accountancy trainee and does not want to conceive at least for the next couple of years. She is very anxious about her irregular menses and is especially worried as

her mother was diagnosed with uterine cancer recently.

Examination is essentially normal apart from coarse dark hair being noticed under her chin and over her lower back.

Investigations during the follicular phase:

Serum androstenedione 10.1 nmol/l (0.6-8.8)

Serum dehydroepiandrosterone sulphate 11.6 µmol/l (2-10)

Serum 17-hydroxyprogesterone 5.6 nmol/l (1-10)

Serum oestradiol 220 pmol/l (200-400)

Serum testosterone 3.6 nmol/l (0.5-3)

Serum sex hormone binding protein 32 nmol/l (40-137)

Plasma luteinising hormone 3.3 U/l (2.5-10)

Plasma follicle-stimulating hormone 3.6 U/l (2.5-10)

What is the most appropriate treatment?

- 1- Combined OCP
- 2- Finasteride
- 3- Metformin
- 4- Progesterone only pill
- 5- Spironolactone

Answer & Comments

Answer: 1- Combined OCP

This young woman has typical features of polycystic ovary syndrome (PCOS), with supportive biochemistry elevated androstenedione, normal oestradiol and 17OHP.

She wants treatment of her hirsutism, does not want to fall pregnant and the most appropriate therapy would be the combined oral contraceptive pill (OCP) such as Dianette.



[Q: 2446] OnExamination 2012 - Endocrinology

A 39-year-old male presents with gynaecomastia.

Which of the following is the most likely cause of his gynaecomastia?

- 1- Congenital adrenal hyperplasia (CAH)
- 2- Hypopituitarism
- 3- Hypothyroidism
- 4- Prolactinoma
- 5- Seminoma

Answer & Comments

Answer: 5- Seminoma

Gynaecomastia is due to a perturbation in the testosterone to oestradiol ratio.

Neither hyperprolactinaemia nor hypopituitarism disturb this ratio and are rarely associated with gynaecomastia.

Unlike hyperthyroidism, hypothyroidism is not a cause.

CAH is not a cause.

However, gynaecomastia may be a presenting symptom of a seminoma and may arise due to human chorionic gonadotropin (HCG) secretion.



[Q: 2447] OnExamination 2012 - Endocrinology

A 31-year-old man presents to the clinic with decreased libido and problems maintaining his erection.

At first he consulted his GP and was told that his problems were most likely to be psychological.

Clinical examination is unremarkable with a BP of 122/80 mmHg and a pulse of 65 and regular. His prolactin level is elevated at 2900 mU/l.

Which of the following is the most likely cause?

- 1- Drug induced hyperprolactinaemia
- 2- Hypothyroidism
- 3- Incidental finding
- 4- Macroprolactinoma
- 5- Microprolactinoma

Answer & Comments

Answer: 5- Microprolactinoma

Drug induced hyperprolactinaemia tends to be associated with levels less than 1000, as does hypothyroidism.

Given his symptoms and the degree of elevation, the prolactin level could not be considered incidental.

Macroprolactinomas tend to be associated with prolactin levels above 3000.



[Q: 2448] OnExamination 2012 - Endocrinology

A 49-year-old city worker attends the clinic for review because of gynaecomastia and erectile dysfunction.

He has mild hypertension for which he takes amlodipine 5 mg daily, but no other past medical history of note. He admits to working long hours and spends a great deal of time entertaining clients.

On examination his BP is 145/82 mmHg, his pulse is 70 and regular and his BMI is 31. He has obvious bilateral gynaecomastia.

Investigations show:

Haemoglobin 10.5 g/dl(13.5-17.7)

White cell count $6.8 \times 10^9/L$ (4-11)

Platelets $197 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (135-146)

Potassium 4.0 mmol/l (3.5-5)

Creatinine 117 $\mu\text{mol/l}$ (79-118)

Alkaline phosphatase 130 U/l (39-117)

Alanine aminotransferase 160 U/l (5-40)

Which of the following is the most likely diagnosis?

- 1- Chronic alcoholism
- 2- Cushing's syndrome
- 3- Haemochromatosis
- 4- Klinefelter's syndrome
- 5- Simple obesity

Answer & Comments

Answer: 1- Chronic alcoholism

Given the history we are provided with, and the fact this patient only has mild obesity and controlled hypertension, Cushing's is unlikely.

Haemochromatosis could be considered if when challenged, this patient denied excess alcohol consumption.

Klinefelter's would not fit well with this phenotype and earlier presentation would be expected.

Simple obesity should not be associated with other medical conditions.



[Q: 2449] OnExamination 2012 - Endocrinology

A 28-year-old woman with a history of hypothyroidism comes to the clinic for review. She is happy to tell you that she is ten weeks pregnant with her first child.

She normally takes 100 mcg of thyroxine daily, and her TSH has been stable at 1.2 for the past two to three years.

Which of the following represents the correct advice with respect to managing her thyroxine dose in pregnancy?

- 1- She should reduce the dose to 75 mcg for fear of inducing foetal hyperthyroidism
- 2- She will probably be able to remain on 100 mcg for the duration of the pregnancy

- 3- She will probably need to increase the dose to 150 mcg during the pregnancy
- 4- She will probably need to increase the dose to 150 mcg immediately post-partum to cope with feeding the child
- 5- She will probably need to increase the dose to 200 mcg during the pregnancy

Answer & Comments

Answer: 2- She will probably be able to remain on 100 mcg for the duration of the pregnancy

Hypothyroidism is the commonest pre-existing endocrine disorders in pregnancy, with an incidence of 9 in 1000 pregnancies. It is most commonly caused by Hashimoto's thyroiditis.

Hypothyroidism has significant consequences for both the mother and foetus. Women can develop congestive cardiac failure, megacolon, adrenal crisis, psychosis, myxoedema coma and hyponatraemia.

For the foetus, there is a small increase in the stillbirth rate and there is a need to therefore monitor the pregnancy more closely. Untreated maternal hypothyroidism can lead to pre-eclampsia, low birth weight, placental abruption and miscarriage. Foetal thyroid development begins at 10-12 weeks gestation, with T4 secretion beginning at 18-20 weeks. T4 is critical for neural development, and is especially important during the second trimester. Maternal thyroid hormone is needed for neuronal development until 12-13 weeks, and recent research has shown children of mothers with hypothyroidism may have a lower IQ than those born to women with normal thyroid function.

Prognosis for mother and foetus is however excellent with appropriate treatment.

Thyroid function tests should be measured every 8-12 weeks if stable, and 4-6 weeks if medication is changed. Thyroxine treatment should be altered according to the free T4

levels as thyroid-stimulating hormone (TSH) may remain elevated even with appropriate treatment (especially in the third trimester). If the patient is stable with regard to thyroxine dose pre-pregnancy then they are likely to remain stable without any dose adjustment during the pregnancy.

Reducing the dose of thyroxine is inappropriate as it runs the risk of inducing maternal hypothyroidism, and the complications associated with this.

Increasing the dose without monitoring the TSH runs the risk of inducing maternal thyrotoxicosis which is potentially damaging to the viability of the pregnancy.

There is no evidence that increasing the dose of thyroxine in the immediate post-partum period is required.



[Q: 2450] OnExamination 2012 - Endocrinology

A 42-year-old alcoholic presents to the clinic with symptoms of lethargy and muscle pains. He also reports intermittent tingling and loss of sensation in his hands and feet. He admits to drinking six to eight pints of lager per day.

On examination his BP is 116/72 mmHg, his pulse is 65 and regular. There are signs of chronic liver disease.

Investigations show:

Haemoglobin 10.8 g/dl(13.5-17.7)

White cell count $5.2 \times 10^9/L$ (4-11)

Platelets $180 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 3.6 mmol/l (3.5-5)

Creatinine 100 $\mu\text{mol/l}$ (79-118)

Urea 5.2 mmol/l (2.5-6.7)

Glucose 5.8 mmol/l (<7.0)

Calcium 2.02 mmol/l (2.20-2.61)

Phosphate 1.6 mmol/l (0.8-1.5)

Alkaline phosphatase 82 U/l (39-117)

Which of the following is the most likely diagnosis?

- 1- Hyperparathyroidism
- 2- Hypoparathyroidism
- 3- Hypothyroidism
- 4- Osteomalacia
- 5- Pseudopseudohypoparathyroidism

Answer & Comments

Answer: 2- Hypoparathyroidism

The biochemical abnormalities automatically preclude pseudopseudohypoparathyroidism, as both the calcium and phosphate are abnormal.

Pseudohypoparathyroidism may fit with this picture, but only if the PTH is elevated.

In osteomalacia it would be expected to see a raised alkaline phosphatase.

Hypothyroidism is not associated with abnormalities in calcium metabolism.



[Q: 2451] OnExamination 2012 - Endocrinology

A 38-year-old man with type 2 diabetes comes to the clinic for review. He was diagnosed three years ago after changing his general practitioner, and has been treated for the past few years with metformin 1 g twice daily.

On examination he is morbidly obese with a BMI of 41.

Investigations show:

Haemoglobin 13.0 g/dl (13.5-18)

White cell count $5.0 \times 10^9/L$ (4-10)

Platelets $149 \times 10^9/L$ (150-400)

Sodium 140 mmol/l (134-143)

Potassium 5.0 mmol/l (3.5-5)

Creatinine 110 $\mu\text{mol/l}$ (60-120)

HbA1c 8.1% (<5.5)

According to the ADA/EASD consensus, which of the following is the most appropriate additional therapy for him?

- 1- Exenatide
- 2- Gliclazide
- 3- Pioglitazone
- 4- Sitagliptin
- 5- Vildagliptin

Answer & Comments

Answer: 1- Exenatide

The preferred pathway for glucose management according to the consensus is to add either sulphonylurea (SU) or insulin to metformin therapy.

However, where weight is of particular concern, exenatide may be considered as an alternative.

This patient's age and weight make weight a particular consideration and as such, exenatide would be the preferred option.

Concerns about limited data and potential impact on immune function are mentioned as potential reasons not to choose dipeptidyl peptidase IV (DPPIV) inhibition and pioglitazone is likely to lead to weight gain.



[Q: 2452] OnExamination 2012 - Endocrinology

A 56-year-old man presented to the Emergency department with an episode of collapse at home. He had been feeling increasingly tired with polyuria for the last two months and also reported a loss of libido.

He had undergone a transsphenoidal surgery two years ago, followed by external beam radiation for a non-functional pituitary adenoma. He took ramipril 10 mg every day for hypertension.

On examination, his pulse was 102 beats per minute and regular, and blood pressure measured 104/66 mmHg in the lying position, dropping to 80/40 mmHg on standing. Heart sounds were normal. There was no galactorrhoea to expression and testicular volume was normal.

Investigations showed:

12 lead ECG Normal

Fasting plasma glucose 4.9 mmol/L (3.0-6.0)

Serum Sodium 129 mmol/L (137-144)

Serum Potassium 4.8 mmol/L (3.5-4.9)

Serum Urea 7.2 mmol/L (2.5-7.5)

Serum creatinine 88 mol/L (60-110)

Serum testosterone 4.5 nmol/L (9-35)

Plasma luteinising hormone 0.3 U/L (1-10)

Plasma thyroid-stimulating hormone 0.1 mU/L (0.4-5)

Plasma Free T₄ 7 pmol/L (10-22)

Insulin-like growth factor 15.2 nmol/L (5.6-23.3)

Which is the most appropriate immediate treatment for this man?

- 1- Desmopressin
- 2- Growth hormone
- 3- Hydrocortisone
- 4- Testosterone
- 5- Thyroxine

Answer & Comments

Answer: 3- Hydrocortisone

This patient is likely to have secondary hypoadrenalism following his pituitary surgery or his radiotherapy.

Hypopituitarism may develop indolently after radiotherapy and patients should be monitored closely for this potential complication.

He requires hydrocortisone replacement therapy at a physiological dose - 10 mg/5 mg/5 mg, mimicking the diurnal cortisol profile.

This diagnosis should not be missed as the consequences may be catastrophic. Hydrocortisone replacement is an urgent measure which may be life-saving, testosterone and thyroxine replacement should then be considered.



[Q: 2453] OnExamination 2012 - Endocrinology

Which one of the following statements applies to an infant with undiagnosed congenital hypothyroidism?

- 1- Gastrointestinal disturbances, especially diarrhoea may develop
- 2- Haemolytic jaundice occurs
- 3- Tachyarrhythmias may occur.
- 4- They may be asymptomatic
- 5- They may later have early acceleration of bone age and short stature at maturity

Answer & Comments

Answer: 4- They may be asymptomatic

Lack of symptoms may be a feature.

Prolonged conjugated hyperbilirubinaemia is seen with this condition.

Bone age and growth will be delayed.

Constipation rather than diarrhoea is observed.

Bradycardia may occur but tachyarrhythmias are not associated.



[Q: 2454] OnExamination 2012 - Endocrinology

An overweight, 60-year-old female with an eight year history of type 2 diabetes mellitus presents with deteriorating glycaemic control.

She takes gliclazide 160 mg twice daily.
Investigations reveal:

Sodium and potassium Normal

Serum Urea 10 mmol/l (2.5-7.5)

Serum Creatinine 160 µmol/l (60-110)

Serum alanine transaminase 31 U/l (5-35)

Serum aspartate transferase 30 U/l (1-31)

HbA1C 8.8% (3.8-6.4)

Which of the following would be the most appropriate additional therapy for improved glycaemic control?

- 1- Acarbose
- 2- Guar gum
- 3- Metformin
- 4- Pioglitazone
- 5- Repaglinide

Answer & Comments

Answer: 4- Pioglitazone

This woman with diabetes has poor glycaemic control with renal impairment.

With creatinine concentrations above 150 µmol/l, metformin is not recommended due to the small risk of lactic acidosis. Therefore, the most appropriate treatment would be pioglitazone, as liver function tests are normal and there is no suggestion of heart failure. It should be noted however, that given her renal impairment she should be closely monitored for fluid retention, and if this occurs, insulin is the other realistic option for her.

Acarbose is poorly tolerated and is now rarely prescribed.

Guar gum has little place in the treatment of diabetes.

Repaglinide the non-sulphonylurea insulin secretagogue would have little benefit in conjunction with a traditional SU such as gliclazide.



[Q: 2455] OnExamination 2012 - Endocrinology

With which of the following is hyperprolactinaemia associated?

- 1- Cabergoline therapy
- 2- Depression
- 3- Fluoxetine therapy
- 4- Hyperthyroidism
- 5- Sheehan's syndrome

Answer & Comments

Answer: 3- Fluoxetine therapy

Hyperprolactinaemia may manifest as a milky discharge from the breasts.

The causes include:

Prolactinoma

Hypothyroidism (far increased thyrotropin-releasing hormone [TRH])

Non-functional tumour with stalk compression and

Drugs, in particular dopamine antagonists such as chlorpromazine, haloperidol and domperidone.

Pregnancy is a particularly common cause of hyperprolactinaemia.

Other drugs that are occasionally reported include selective serotonin reuptake inhibitors (SSRIs).

Polycystic ovary syndrome (PCOs) is often associated with idiopathic hyperprolactinaemia.



[Q: 2456] OnExamination 2012 - Endocrinology

Primary hyperparathyroidism may occur in association with which of the following conditions?

- 1- Autoimmune polyendocrine syndrome

- 2- Chronic renal failure (CRF)
- 3- Gastrinoma
- 4- Sjogren's syndrome
- 5- Vitamin D deficiency

Answer & Comments

Answer: 3- Gastrinoma

The association of primary hyperparathyroidism and a gastrinoma would suggest a diagnosis of multiple endocrine neoplasia type 1.

CRF causes secondary or tertiary hyperparathyroidism, with vitamin D deficiency causing secondary hyperparathyroidism.

There is no association with Sjogren's.



[Q: 2457] OnExamination 2012 - Endocrinology

Which of the following is typically found in Pendred's syndrome?

- 1- Cataract
- 2- Mental retardation
- 3- Sensorineural deafness
- 4- Thyroid agenesis
- 5- Thyrotoxicosis

Answer & Comments

Answer: 3- Sensorineural deafness

Pendred's syndrome is an autosomal recessive condition which includes nerve deafness with goitre due to a defect of iodine binding.

Patients are usually euthyroid.



[Q: 2458] OnExamination 2012 - Endocrinology

You are trialling a new dipeptidyl peptidase IV (DPP-IV) inhibitor which you believe may have greater specificity for the DPP-IV enzyme than

other members of the class and therefore offer advantages for treatment of type 2 diabetes.

Which of the following correctly reflects one aspect of the mode of action of DPP-IV inhibition?

- 1- Glucose dependent glucagon suppression
- 2- Glucose dependent insulin suppression
- 3- Increased GI motility
- 4- Increased release of GIP
- 5- Increased release of GLP-1

Answer & Comments

Answer: 1- Glucose dependent glucagon suppression

DPP-IV inhibitors enhance the incretin effect which is a peak of insulin release associated with an oral glucose load; as such they are associated with glucose dependent insulin stimulation.

They are associated with reduced gastrointestinal motility; they are weight neutral when used in the treatment of type 2 diabetes.

DPP-IV inhibitors do not increase the release of incretins, merely interfere with their breakdown.



[Q: 2459] OnExamination 2012 - Endocrinology

A 45-year-old man who has undergone bilateral adrenalectomy for Cushing's returns to the clinic for his yearly follow up appointment.

Over the course of the past few months he has begun to feel increasingly tired and has given up driving after suffering a road traffic accident where he did not see a car coming from the side.

On examination his BP is 132/72 mmHg, his pulse is 70 and regular. His BMI is 28. You notice that his skin appears tanned.

Investigations show:

Haemoglobin 13.2 g/dl(13.5-17.7)

White cell count $5.9 \times 10^9/L$ (4-11)

Platelets $203 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 4.0 mmol/l (3.5-5)

Creatinine 112 $\mu\text{mol/l}$ (79-118)

Urea 5.2 mmol/l (2.5-6.7)

Glucose 5.2 mmol/l (<7.0)

TSH 0.1 (0.5-4.5)

Which of the following is the most appropriate intervention?

- 1- Carbimazole
- 2- Increased hydrocortisone replacement
- 3- Octreotide
- 4- Referral to a pituitary surgeon
- 5- Thyroxine replacement

Answer & Comments

Answer: 4- Referral to a pituitary surgeon

Carbimazole is incorrect as this patient actually has pituitary dependent hypothyroidism as a result of his tumour.

Increased hydrocortisone treatment will also not suppress the pituitary adenoma.

Octreotide has shown some success in clinical trials but is inferior to surgical intervention, and thyroxine replacement, whilst correcting hypothyroidism will not resolve the underlying adenoma.



[Q: 2460] OnExamination 2012 - Endocrinology

A 58-year-old man who has a history of type 2 diabetes comes to the clinic because he has severe pins and needles and pains in his lower

legs and feet, particularly in the early hours of the morning, which are affecting his sleep almost every night.

He takes BD 30/70 mixed insulin for control of his blood sugar, has had an inferior MI previously and treated hypertension. Medication apart from insulin includes ramipril, atorvastatin, amlodipine, tamsulosin and aspirin.

On examination his BP is 149/78 mmHg, his pulse is 82. His chest is clear and his abdomen is soft and non-tender. He has sensory loss to the mid shin bilaterally.

Investigations show:

Haemoglobin 12.8 g/dl(11.5-16.5)

White cells $5.2 \times 10^9/L$ (4-11)

Platelet $188 \times 10^9/L$ (150-400)

Sodium 141 mmol/l (135-146)

Potassium 4.9 mmol/l (3.5-5)

Creatinine 133 $\mu\text{mol/l}$ (79-118)

HbA1c 7.6%(<5.5)

Which of the following is the most appropriate initial therapy for his neuropathy?

- 1- Amitriptyline
- 2- Carbamazepine
- 3- Duloxetine
- 4- Gabapentin
- 5- Valproate

Answer & Comments

Answer: 3- Duloxetine

Duloxetine is recommended in NICE guidelines for the management of peripheral neuropathy. The starting dose is 60 mg daily although this may be increased up to 120 mg/day. It cannot be used in patients with a history of acute narrow angle glaucoma.

Opioid based agents should be avoided unless there has been previous recommendation/assessment by a specialist.

Amitriptyline is incorrect because it is an alternative option to duloxetine if it is contraindicated; a dose of 10-75 mg/day is recommended.

Carbamazepine is incorrect because it is not featured in the NICE guidelines for the management of peripheral neuropathy.

Duloxetine is correct because it is the standard first line therapy for neuropathy.

Gabapentin is incorrect because it may be used in the management of neuropathy, but more usually pregabalin is recommended either as a second line agent or in combination with amitriptyline.

Valproate is incorrect because it is not featured in the NICE guidelines for the management of peripheral neuropathy.

Neuropathic pain - pharmacological management



[Q: 2461] OnExamination 2012 - Endocrinology

A 60-year-old woman with a history of type 2 diabetes comes to the clinic for review.

She is currently managed with gliclazide 160 mg BD as she failed to tolerate metformin, but she is finding it difficult to manage her blood sugar control. Her morning finger prick testing glucoses approaches 10 mmol/l glucose.

On examination her BMI is 36, her BP is 155/90 mmHg, her pulse is 86 and regular. Apart from her obesity, physical examination is unremarkable.

Investigations

Haemoglobin 12.2 g/dl (11.5-16.5)

White cell count $5.1 \times 10^9/L$ (4-11)

Platelets $203 \times 10^9/L$ (150-400)

Sodium 141 mmol/l (135-146)

Potassium 4.3 mmol/l (3.5-5)

Creatinine 210 $\mu\text{mol/l}$ (79-118)

HbA1C 8.8% (<5.5)

Which of the following is the next most appropriate step in managing her blood glucose control?

1- Exenatide

2- Metformin slow release

3- Pioglitazone

4- Sitagliptin

5- Switch to insulin

Answer & Comments

Answer: 5- Switch to insulin

This woman has significant renal impairment, as illustrated by a creatinine of 210. As such, options are limited; both sitagliptin and exenatide are not recommended in patients with this degree of renal impairment, and metformin is contraindicated.

While glitazones are effective in lowering blood glucose, in this patient type they are likely to lead to significant fluid retention.

This leaves insulin switch as the most appropriate option, despite the fact it is likely to result in further weight gain.



[Q: 2462] OnExamination 2012 - Endocrinology

A 45-year-old male presents concerned about his risk of developing diabetes.

His family history reveals that his mother and maternal uncle both have diabetes. He has central obesity with a waist measurement of 110 cm. On examination, his blood pressure is 130/82 mmHg, his BMI is 30.2 kg/m^2 .

His investigations reveal:

Fasting cholesterol 5.2 mmol/l (<5.2)

Triglycerides 1.4 mmol/l (0.45-1.69)

HDL cholesterol 1.1 mmol/l (>1.55)

Fasting glucose 6.2 mmol/l (3.0-6.0)

In addition to his waist measurement which of this man's observations fulfills the criteria for the diagnosis of the metabolic syndrome?

- 1- Blood pressure of 130/82 mmHg
- 2- BMI of 30.2 kg/m²
- 3- Fasting plasma glucose of 6.2 mmol/l
- 4- HDL concentration of 1.1 mmol/l
- 5- Triglyceride concentration of 1.4 mmol/l

Answer & Comments

Answer: 3- Fasting plasma glucose of 6.2 mmol/l

The metabolic syndrome is becoming hugely important as a cluster of features associated with increased cardiovascular and diabetes risk.

The condition is defined by various criteria the latest of which is the global definition for the IDF as central obesity (≥94 cm for men, ≥80 cm for women) plus any two of the following:

Hypertriglyceridaemia >1.7 mmol/l

Low HDL concentration <1.03 mmol/l male, <1.29 mmol/l female

BP ≥ 130/85 mmHg, or on treatment for hypertension

Fasting glucose ≥5.6 mmol/l, or known to have type 2 diabetes.

Thus, in our patients case the elevated fasting glucose of 6.2 mmol/l fulfils this diagnostic criterion.

The BMI is not a function of the diagnostic criterion as the waist circumference appears to be a far more powerful predictor of risk.



[Q: 2463] OnExamination 2012 - Endocrinology

A patient with type 2 diabetes being treated with gliclazide presents with sweating and dizziness. Blood glucose was 1.9 mmol/L (3.0-6.0).

He is on long-standing treatment for hypertension, atrial fibrillation, joint pain and indigestion. These treatments have not changed recently.

You understand that he has recently been prescribed an agent for balanitis by his GP.

Which of the following drugs may be responsible for increasing the likelihood of hypoglycaemia in this situation?

- 1- Aspirin
- 2- Atenolol
- 3- Digoxin
- 4- Fluconazole
- 5- Ranitidine

Answer & Comments

Answer: 4- Fluconazole

As a result of drug interaction hypoglycaemia may be potentiated when a sulphonylurea is used concurrently with agents such as

Long-acting sulfonamides

Tuberculostatics

Phenylbutazone

Clofibrate

Monoamine oxidase (MAO) inhibitors

Coumarin derivatives

Salicylates

Probenecid

Propranolol

Cimetidine

Disopyramide

Angiotensin converting enzyme inhibitors.

Gliclazide is a sulphonylurea drug with an intermediate half life of around 11 hours. It is extensively metabolised within the liver by CYP2C9. Within the circulation, gliclazide is

highly bound to plasma proteins, about 94%. Renal clearance accounts for only 4% of total drug clearance.

Therefore gliclazide action can be potentiated predominantly by two mechanisms:

- 1: Displacement of the drug from plasma proteins to give more free (unbound) drug - some agents such as aspirin can do this.
- 2: Interference with the hepatic metabolism of the drug.

The only change in this patient's treatment recently has been the addition of an antimicrobial agent.

Fluconazole has a low level of plasma protein binding and it is excreted by the kidney. However, it is also a potent inhibitor of CYP2C8 and CYP2C9 and can thus interact with gliclazide and other sulphonylureas (for example, glimepiride, glibenclamide, tolbutamide and glipizide).

Thus the best answer in this scenario would be likely to be fluconazole.



[Q: 2464] OnExamination 2012 - Endocrinology

An 18-year-old female with polycystic ovary syndrome was prescribed metformin.

What is the most important pharmacological action of metformin in this situation?

- 1- Increasing gluconeogenesis
- 2- Increasing insulin levels
- 3- Increasing luteinising hormone levels
- 4- Increasing oestradiol levels
- 5- Increasing peripheral glucose uptake

Answer & Comments

Answer: 5- Increasing peripheral glucose uptake

Lowering serum insulin concentrations with metformin ameliorates hyperandrogenism, by

reduction of ovarian enzyme activity that results in ovarian androgen production.

Clinical studies have shown that metformin reduces insulin resistance, and have demonstrated a fall in serum androgens, luteinising hormone and weight.

The reduced insulin resistance is associated with reduced insulin drive to the insulin sensitive ovary in polycystic ovarian syndrome and hence reduces androgen production.



[Q: 2465] OnExamination 2012 - Endocrinology

A 33-year-old woman with an 18 year history of type I diabetes mellitus presents with proteinuria. She is a smoker of 20 cigarettes daily.

Examination reveals a blood pressure of 155/95 mmHg.

Investigations reveal:

Serum cholesterol 7.6 mmol/L(<5.2)

HbA1c 8.3%(3.8-6.4)

24 hour urinary protein excretion 1.5 g(<0.2)

Which intervention is most likely to retard the development of renal failure?

- 1- Bendroflumethiazide
- 2- Improve glycaemic control with HbA1c less than 7%
- 3- Lisinopril
- 4- Simvastatin
- 5- Stop smoking

Answer & Comments

Answer: 3- Lisinopril

This patient has diabetic nephropathy with marked proteinuria.

To attenuate the progression towards end stage renal disease, stringent blood pressure control should be employed maintaining a BP less than 130/80 mmHg and an angiotensin-

converting enzyme (ACE) inhibitor would probably offer even greater reno-protection than any other anti-hypertensive.

Simvastatin has no proven benefit on renal disease and improved glycaemic control although of benefit would be of less benefit than BP control (UKPDS/DCCT trials).

Again stopping smoking would probably be of greatest benefit to her with regard to reducing cardiovascular risk but would not itself offer any reno-protective effect.



[Q: 2466] OnExamination 2012 - Endocrinology

A 55-year-old female who received radioactive iodine over five years ago presents for annual thyroid function assessment. She is well and takes no medication.

Her results reveal:

Free Thyroxine 13.2 pmol/L (10-22)

TSH 16 mU/L (0.4-5)

Total cholesterol 6.8 mmol/L (<5.2)

Plasma triglycerides 2.2 mmol/L (0.45-1.69)

What is the most appropriate treatment for this patient's dyslipidaemia?

- 1- Cholestyramine
- 2- Fibrate therapy
- 3- Hormone replacement therapy
- 4- Statin therapy
- 5- Thyroxine

Answer & Comments

Answer: 5- Thyroxine

This patient has subclinical hypothyroidism as reflected by the normal thyroxine (T4) but elevated thyroid-stimulating hormone (TSH).

A hypercholesterolaemia with hypertriglyceridaemia is frequently associated due to impaired lipoprotein lipase function.

The dyslipidaemia may well resolve following the appropriate replacement with thyroxine.



[Q: 2467] OnExamination 2012 - Endocrinology

A 42-year-old man is referred to the endocrine clinic for investigation of a thyroid mass.

He tells you that his mother and brother both suffered from thyroid cancer, but he has not responded to multiple invitations from the local endocrine clinic to attend for review.

He has been attending his GP who is finding his blood pressure difficult to manage. He is currently taking ramipril 10 mg daily and amlodipine 10 mg.

On examination in the clinic his BP is 155/100 mmHg, his pulse is 85 and regular. There is a firm left sided thyroid mass, around 3 cm in diameter.

Investigations show:

Haemoglobin 13.5 g/dl (11.5-16.5)

White cells $6.5 \times 10^9/L$ (4-11)

Platelet $359 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (135-146)

Potassium 4.6 mmol/l (3.5-5)

Creatinine 92 $\mu\text{mol/l}$ (79-118)

TSH 3.1 (0.5-5.0)

Calcium 2.91 mmol/l (2.2-2.60)

Which of the following is the next step?

- 1- Abdominal MRI
- 2- Excision biopsy of the thyroid
- 3- Growth hormone suppression test
- 4- MRI pituitary
- 5- Pentagastrin suppression test

Answer & Comments

Answer: 1- Abdominal MRI

The history of thyroid carcinoma in two first degree relatives raises the possibility of a familial thyroid cancer syndrome.

The hypercalcaemia further increases suspicion that this is medullary carcinoma of the thyroid.

If there is any suggestion of phaeochromocytoma, and the hypertension raises that possibility here, adequate investigation and possible removal of adenoma before thyroidectomy is crucial.

In the event of a phaeochromocytoma, alpha blockade with phenoxybenzamine is the primary strategy for blood pressure control.

A. Abdominal MRI is the correct answer because exclusion of phaeochromocytoma is crucial before considering thyroidectomy.

B. Excision biopsy is incorrect, because surgery should not be attempted prior to excluding phaeochromocytoma, and thyroidectomy is the treatment of choice.

C. Growth hormone suppression test is incorrect; pituitary adenomas are a feature of multiple endocrine neoplasia-1 (MEN-1).

D. MRI pituitary is incorrect; pituitary adenomas are a feature of MEN-1.

E. Pentagastrin suppression test is incorrect because there is an obvious thyroid tumour, and this should not delay progression to surgery.



[Q: 2468] OnExamination 2012 - Endocrinology

A 55-year-old man presents with gynaecomastia. He is receiving treatment for heart failure and gastro-oesophageal reflux.

Which of the following drug he takes is most likely to be responsible for his gynaecomastia?

1- Amitriptyline

2- Carvedilol

3- Furosemide

4- Spironolactone

5- Ramipril

Answer & Comments

Answer: 4- Spironolactone

Spironolactone is associated with gynaecomastia.

Other agents causing of gynaecomastia include:

amiloride

to a lesser extent eplerenone

digoxin

luteinising hormone-releasing hormone (LHRH) analogues

finasteride.



[Q: 2469] OnExamination 2012 - Endocrinology

Which of the following is a likely presenting feature of Cushing's syndrome?

1- Diabetes insipidus

2- Lichen planus

3- Mononeuritis multiplex

4- Necrosis of the femoral head

5- Polymyositis

Answer & Comments

Answer: 4- Necrosis of the femoral head

Cases of Cushing's syndrome have presented with necrosis of the femoral head due to osteoporosis.

Diabetes insipidus would be very unusual, whereas diabetes mellitus may occur in 30%.

Lichen planus is treated with corticosteroids, as is polymyositis.

Mononeuritis multiplex is not a feature.



[Q: 2470] OnExamination 2012 - Endocrinology

A 62-year-old man with extensive metastases from ileal carcinoid is admitted to the Emergency department with deteriorating health.

He has become increasingly confused with worsening symptoms of diarrhoea over the past few weeks. You find that he has impaired short term memory and increased skin pigmentation.

Deficiency of which vitamin is a potential problem?

- 1- Ascorbic acid
- 2- Folate
- 3- Niacin
- 4- Riboflavin
- 5- Thiamine

Answer & Comments

Answer: 3- Niacin

Extensive metastases from carcinoid can lead to metabolism of very large amounts of tryptophan. This then leads to a pellagra-like picture.

In normal patients, only 1% of dietary tryptophan is converted to serotonin, in patients with carcinoid syndrome this value may increase to 70%.

The diversion of tryptophan to making serotonin in patients with metastatic tumors can result in tryptophan deficiency. Carcinoid syndrome can then lead to niacin deficiency, and clinical manifestations of pellagra.

None of the other vitamins listed are deficient in patients with metastatic carcinoid, so niacin is the only possible correct answer.

Thiamine deficiency is associated with memory loss, but is also associated with peripheral neuropathy and tends to occur in alcoholic individuals.



[Q: 2471] OnExamination 2012 - Endocrinology

Which of the following statements is true of type 2 diabetes mellitus?

- 1- 20% of patients develop macrovascular complications within 10 years of diagnosis
- 2- A single fasting plasma glucose above 8 mmol/l is diagnostic of diabetes.
- 3- Drug treatment is associated with a 25% reduction in microvascular complications compared with diet alone.
- 4- Metformin is the preferable treatment in the obese patient with type 2 diabetes
- 5- Type 2 diabetes is associated with being underweight

Answer & Comments

Answer: 4- Metformin is the preferable treatment in the obese patient with type 2 diabetes

The diagnosis of type 2 diabetes is made by demonstrating a fasting plasma glucose >6.9 on two separate occasions and is associated with being overweight.

Drug treatment of type 2 diabetes is associated with a linear reduction in mortality related to level of glycaemic lowering.

The rate of macrovascular complications within 10 years of diagnosis is much higher than 20%.

UKPDS (United Kingdom Prospective Diabetes Study) has shown that metformin is the preferable first line therapy in type 2 diabetes.

Sulphonylureas are associated with marginally higher cardiovascular mortality and weight gain.



[Q: 2472] OnExamination 2012 - Endocrinology

An 18-year-old man develops thirst, weight loss and polyuria.

Investigations confirm that he has type 1 diabetes and is treated with basal bolus insulin.

He is keen to know what limitations this diagnosis imposes on career opportunities.

Which of the following professions would he not be able to pursue?

- 1- Ambulance control centre worker
- 2- Civil engineer
- 3- Milkman
- 4- Physical education instructor
- 5- Police advanced driver

Answer & Comments

Answer: 5- Police advanced driver

Most police forces have their own policies with regard to applications from diabetic people. Provided their diabetes is stable and well controlled, they may be considered for the police force but most forces have a blanket ban on any advanced driving duties.

The armed forces, working offshore or aboard ships, air pilot, HGV/PSV licence, fire or driving in the post office are career paths closed to subjects with insulin dependent diabetes.

Some local authorities do permit licences to taxi drivers with insulin treated diabetes whilst others do not.



[Q: 2473] OnExamination 2012 - Endocrinology

A 19-year-old female with type 1 diabetes is admitted with diabetic ketoacidosis.

Which of the following is most appropriate concerning the use of a bicarbonate infusion?

- 1- Bicarbonate infusion should be considered at pH less than 7
- 2- Commence a bicarbonate infusion with a ketone concentration above 5 mmol/l (NR less than 1)

- 3- Commence bicarbonate infusion with a potassium concentration above 6 mmol/l
- 4- Commence a bicarbonate infusion with a standard bicarbonate concentration below 5 mmol/l (NR 22-26)
- 5- No benefit from using a bicarbonate infusion

Answer & Comments

Answer: 1- Bicarbonate infusion should be considered at pH less than 7

The use of bicarbonate in DKA is controversial (pdf).

However, most authorities agree that a bicarbonate infusion may be used in subjects with a severe metabolic acidosis (pH less than 7).



[Q: 2474] OnExamination 2012 - Endocrinology

A 23-year-old woman presents to the clinic with lethargy and recurrent fainting attacks.

She is usually fit and well and her only medication of note is the progesterone only pill.

On examination her BP is 110/70 mmHg, she has a postural drop of 20 mmHg on standing. Her BMI is 19. Respiratory and abdominal examination is normal.

Investigations show:

Haemoglobin 10.9 g/dl(11.5-16.0)

White cell count $7.1 \times 10^9/L$ (4-11)

Platelets $203 \times 10^9/L$ (150-400)

Sodium 131 mmol/l (135-146)

Potassium 5.1 mmol/l (3.5-5)

Creatinine 125 $\mu\text{mol/l}$ (79-118)

Which of the following investigations would be most likely to elucidate the underlying diagnosis?

- 1- Abdominal x ray

- 2- Adrenal autoantibodies
- 3- Chest x ray
- 4- Random cortisol
- 5- Short Synacthen test

Answer & Comments

Answer: 5- Short Synacthen test

Abdominal x ray may be useful if adrenal calcification is suspected, and a chest x ray may reveal underlying TB, but both of these are investigations to be performed after the initial diagnosis is made.

Equally, adrenal antibodies may establish if the cause is autoimmune.

Random cortisol is less useful than a short Synacthen test as cortisol production varies during the course of a day.



[Q: 2475] OnExamination 2012 - Endocrinology

A 35-year-old man comes to the clinic for review after referral from his GP. He was admitted to the intensive care unit after a motorbike accident and has only recently been discharged from hospital.

He complains of lethargy and tiredness.

His thyroid function testing is described below:

TSH 0.3 IU/l (0.5-4.5)

Free T₄ 8 pmol/l (9-25)

Free T₃ 3.1 pmol/l (3.4-7.2)

Which of the following is the most likely diagnosis?

- 1- Hashimoto's thyroiditis
- 2- Graves' disease
- 3- Secondary thyroid failure
- 4- Sick euthyroid syndrome
- 5- Subacute thyroiditis

Answer & Comments

Answer: 4- Sick euthyroid syndrome

Hashimoto's thyroiditis would be associated with a raised thyroid-stimulating hormone (TSH) and decreased tri-iodothyronine (T₃) and thyroxine (T₄).

Graves' would be associated with a raised T₃ and T₄ and a decreased TSH.

Subacute thyroiditis is associated with transient hyperthyroidism and pain over the gland.

Secondary thyroid failure would be a differential, but measurement of reverse T₃ would help differentiate between this and sick euthyroid syndrome.



[Q: 2476] OnExamination 2012 - Endocrinology

A 42-year-old woman presents to the endocrine clinic with weight gain, hypertension and impaired glucose tolerance. Over the past year she has gained 8 kg in weight.

Other symptoms include heightened libido and increased hair growth on the lower abdomen and upper chest.

On examination her BP is 162/95 mmHg, pulse is 68 and regular. She has a BMI of 32 and abdominal striae.

Investigations show:

Haemoglobin 10.5 g/dl (11.5-16.0)

White cell count $8.0 \times 10^9/L$ (4-11)

Platelets $205 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 3.9 mmol/l (3.5-5)

Creatinine 123 $\mu\text{mol/l}$ (79-118)

Alkaline phosphatase 240 U/l (39-117)

Alanine aminotransferase 190 U/l (5-40)

Overnight dexamethasone suppression test positive

Which of the following is the most likely diagnosis?

- 1- Adrenal adenoma
- 2- Adrenal carcinoma
- 3- Pituitary adenoma
- 4- Pseudo-Cushing's
- 5- Simple obesity

Answer & Comments

Answer: 2- Adrenal carcinoma

The features of virilisation, whilst not invariably associated with adrenal carcinoma, favour this as the diagnosis, rather than an adenoma. The abnormal liver function tests (LFTs) also suggest metastases which would not be seen with an adenoma.

Pituitary disease would not be expected to be associated with virilisation or abnormal LFTs.

Pseudo-Cushing's and simple obesity are ruled out by the abnormal clinical findings seen here.



[Q: 2477] OnExamination 2012 - Endocrinology

According to the new revised criteria for diagnosing diabetes in an asymptomatic patient:

- 1- A fasting venous plasma concentration of < 6.9 can be ignored
- 2- A single fasting venous plasma glucose concentration of > 7 mmol/l can be used to diagnose diabetes
- 3- Impaired glucose tolerance is signified by a venous glucose concentration of < 7 mmol and > 11.1 mmol
- 4- 75 gm oral glucose test is mandatory for diagnosing diabetes
- 5- Two separate fasting venous plasma glucose concentration of > 7 mmol/l is diagnostic of diabetes

Answer & Comments

Answer: 5- Two separate fasting venous plasma glucose concentration of > 7 mmol/l is diagnostic of diabetes

In an asymptomatic individual, a single sample alone is not sufficient for diagnosis.

Diabetes can be diagnosed if separate fasting samples show above 7 mmol/l.

75 gram oral glucose test (OGT) is still the gold standard for diagnosing diabetes, although fasting glucose can be used, provided adequate fast is ensured.

Fasting glucose of above 6.1 but below 6.9 is classed as impaired fasting glycaemia, which is a new category of glycaemia. IGT = 7.8 - 11.1



[Q: 2478] OnExamination 2012 - Endocrinology

A 25-year-old female presents with weight gain, oligomenorrhoea and primary infertility. She has a history of bipolar disorder for which she takes lithium.

On examination she has a BMI of 32 kg/m².

Investigations reveal:

Free T₄ 6.4 pmol/l (10-22)

TSH 42 mU/l (0.4-5)

Prolactin 980 mU/l (50-450)

What is the most appropriate treatment for this patient?

- 1- Cabergoline
- 2- Cabergoline plus thyroxine
- 3- Metformin
- 4- Stop lithium
- 5- Thyroxine

Answer & Comments

Answer: 5- Thyroxine

This patient has primary hypothyroidism which would explain the increasing weight and the associated hyperprolactinaemia.

The latter occurs as a consequence of reduced dopaminergic tone.

Lithium may be the cause of this but stopping it is not usually attempted since it may dangerously exacerbate the psychiatric illness. There is an excellent review by John Lazarus on this topic¹ where he says, "The common clinical side effects of the drug are goitre in up to 40% and hypothyroidism in about 20%. Lithium increases thyroid autoimmunity if present before therapy. Treatment with levothyroxine is effective and lithium therapy should not be stopped."

The most appropriate treatment for her would be thyroxine which would, through euthyroidism, be expected to normalise prolactin concentration.

In turn this may improve weight, menstrual function and fertility.

Reference:

Lazarus JH. Lithium and thyroid. *Best Pract. Res. Clin. Endocrinol. Metab.* 2009;23(6):723-733.



[Q: 2479] OnExamination 2012 - Endocrinology

A 70-year-old male was receiving amiodarone 200 mg daily for intermittent atrial fibrillation. However, he was aware of tiredness and lethargy. He appeared clinically euthyroid with no palpable goitre.

Investigations revealed:

Serum Free T₄ 23pmol/l (9-26)

Serum total T₃ 0.8 nmol/l (0.9-2.8)

Serum TSH 8.2 mU/l (<5)

Which of the following statements would explain these results?

- 1- Abnormal thyroxine binding globulin
- 2- Amiodarone-induced hypothyroidism

- 3- 'Sick euthyroid' syndrome
- 4- Spontaneous hypothyroidism
- 5- TSH secreting pituitary adenoma

Answer & Comments

Answer: 2- Amiodarone-induced hypothyroidism

The results show normal thyroxine (T₄), low triiodothyronine (T₃) with elevated thyroid-stimulating hormone (TSH).

These results are typical of amiodarone-induced hypothyroidism which inhibits the peripheral conversion of T₄ to T₃.



[Q: 2480] OnExamination 2012 - Endocrinology

A 16-year-old female patient is referred with primary amenorrhoea.

Investigations reveal a 46 XY karyotype.

Which of the following concerning the condition is true?

- 1- A diagnosis of Turner's syndrome is likely
- 2- It is likely that her mother received carbimazole for thyrotoxicosis during pregnancy
- 3- Low testosterone and oestradiol concentrations would be expected
- 4- The diagnosis is likely to be androgen insensitivity syndrome
- 5- The diagnosis is Noonan's syndrome

Answer & Comments

Answer: 4- The diagnosis is likely to be androgen insensitivity syndrome

A female phenotype can occur in androgen insensitivity syndrome, due to an androgen receptor defect. This was previously referred to as testicular feminisation syndrome.

Stilboestrol therapy has been associated with the induction of latent tumours and with

influencing sexual behaviour, but is not associated with abnormalities of sexual identity.

In Noonan's syndrome, infants are males but physical features resemble those found in Turner's syndrome.

Neither prednisolone nor maternal thyrotoxicosis would cause gender malassignment problems.



[Q: 2481] OnExamination 2012 - Endocrinology

A 40-year-old man with diabetes presents with deteriorating thirst and nocturia.

He had been diagnosed with diabetes mellitus five years ago and is now taking maximal metformin and gliclazide yet his HbA1c is 10.9% (3.8-6.4).

You want to change him to insulin but he informs you that he is employed as a lorry driver.

What would be the impact of converting him to insulin on his heavy goods vehicle (HGV) licence?

- 1- Can keep his HGV licence
- 2- Can regain his HGV licence after one year without hypoglycaemic episodes
- 3- Can regain his HGV licence if after six months he does not have any hypoglycaemic episodes
- 4- Temporary suspension of his HGV licence until established on stable doses of insulin
- 5- Will lose his HGV licence indefinitely whilst treated with insulin

Answer & Comments

Answer: 5- Will lose his HGV licence indefinitely whilst treated with insulin

Switching patients to insulin does have a major impact on their ability to pursue certain careers and/or vehicle licensing.

Insulin treated diabetics are unable to hold a HGV or PSV licence and in some councils are unable to have a taxi licence.

For further reading on employment restrictions and diabetes read here.



[Q: 2482] OnExamination 2012 - Endocrinology

A 54-year-old woman presents to the clinic for review.

Unfortunately she has carcinoid with extensive hepatic metastases and still has significant diarrhoea and flushing.

Which of the following is the initial medical therapy of choice for her?

- 1- Bromocriptine
- 2- Cabergoline
- 3- Interferon alpha
- 4- Octreotide
- 5- Somatotrophin

Answer & Comments

Answer: 4- Octreotide

Bromocriptine and cabergoline are dopamine agonists used in the treatment of prolactinomas.

Somatotrophin is a growth hormone analogue and as such its use may actually worsen the symptoms of carcinoid syndrome.

Interferon alpha can be used as an adjunct to octreotide in patients with resistant symptoms of carcinoid.



[Q: 2483] OnExamination 2012 - Endocrinology

Which one of the following concerning insulin is correct?

- 1- Acts via a similar mechanism to steroid receptors
- 2- Can be detected in the lymph

- 3- Causes an increased glucose-protein transport on the endoplasmic reticulum
- 4- Interacts with the nuclear membrane
- 5- Is synthesised in the alpha cells of islets of Langerhans

Answer & Comments

Answer: 2- Can be detected in the lymph

Insulin acts via cell surface receptors.

Insulin binding to its receptor results in receptor autophosphorylation on tyrosine residues and the tyrosine phosphorylation of insulin receptor substrates (IRS-1, IRS-2 and IRS-3) by the insulin receptor tyrosine kinase.

Insulin is synthesised in the beta cells of the islets of Langerhans not the alpha cells.



[Q: 2484] OnExamination 2012 - Endocrinology

Which of the following percentages most accurately reflects the mortality associated with the modern management of diabetic ketoacidosis?

- 1- 0.5%
- 2- 1%
- 3- 2-3%
- 4- 5-6%
- 5- 8-10%

Answer & Comments

Answer: 3- 2-3%

Despite the advances in the management of diabetes in general and the improvements in intensive care, studies reveal that the mortality associated with diabetic ketoacidosis remains stubbornly around the 2-5% since the 1970s.

Specifically, mortality relates to cerebral oedema.



[Q: 2485] OnExamination 2012 - Endocrinology

A 56-year-old male presents with a five year history of increased sweats and change in shoe size.

Examination reveals prognathism and macroglossia, with large hands.

Blood pressure is 180/94 mmHg but visual field examination is full to confrontation.

Which of the following tests would be diagnostic?

- 1- IGF-1 concentration
- 2- Insulin tolerance test
- 3- Oral glucose tolerance test
- 4- Pituitary MRI
- 5- TRH test

Answer & Comments

Answer: 3- Oral glucose tolerance test

The diagnosis of acromegaly is confirmed with a failure of growth hormone suppression during an oral glucose tolerance test.

Though a pituitary adenoma may be present it is not diagnostic of acromegaly.



[Q: 2486] OnExamination 2012 - Endocrinology

A 35-year-old man presents with weakness and tiredness.

He is noted to be hypertensive.

Electrolytes show a hypokalaemia and hypomagnesaemia.

What investigation would you select for this patient?

- 1- Colonoscopy
- 2- Oral glucose tolerance test
- 3- Plasma renin to aldosterone ratio
- 4- Serum amylase
- 5- Serum calcium

Answer & Comments

Answer: 3- Plasma renin to aldosterone ratio

This scenario illustrates that young patients with hypertension may have underlying secondary causes.

This patient has primary hyperaldosteronism, which is thought to be a reasonably common cause of hypertension.

Primary hyperaldosteronism is associated with high aldosterone, suppressed renin, alkalosis, low potassium, low magnesium and normal/high sodium.

An important differential diagnosis here is renal artery stenosis.

Causes of primary hyperaldosteronism include:

Conn's syndrome (adrenal adenoma) causes over 50%.

Adrenal hyperplasia

Adrenal carcinoma (rare)

Glucocorticoid deficiency - also called glucocorticoid-remediable aldosteronism. Note that this is isolated glucocorticoid (cortisol) deficiency driving high ACTH levels and increased aldosterone production. Addison's disease is different as it involves both glucocorticoid and mineralocorticoid deficiencies.



[Q: 2487] OnExamination 2012 - Endocrinology

Which of the following is true concerning oral hypoglycaemic agents?

- 1- Acarbose promotes insulin secretion in response to meals
- 2- Chlorpropamide induces liver enzymes
- 3- Glibenclamide is excreted unchanged by the kidney
- 4- Gliclazide inhibits gluconeogenesis

5- Metformin inhibits hepatic gluconeogenesis

Answer & Comments

Answer: 5- Metformin inhibits hepatic gluconeogenesis

Chlorpropamide, like all the other sulfonylureas, stimulates pancreatic insulin secretion.

They are not liver enzyme inducers but are affected by liver enzyme inducers and inhibitors. They undergo hepatic metabolism then renal excretion.

Acarbose is an alpha glucosidase inhibitor which inhibits the splitting of disaccharides into glucose and so inhibits glucose absorption from the gut.

Metformin is an insulin sensitiser and although its actions are not fully understood its main role appears to be through inhibition of hepatic gluconeogenesis.



[Q: 2488] OnExamination 2012 - Endocrinology

Which of the following is associated with congenital adrenal hyperplasia (CAH)?

- 1- Delayed puberty
- 2- Hypopigmentation
- 3- Hyporeninaemia
- 4- Persistent wolffian duct
- 5- Premature epiphyseal closure

Answer & Comments

Answer: 5- Premature epiphyseal closure

Premature epiphyseal closure is a classical feature of CAH and is secondary to high levels of sex steroids.

Under, and over treatment of CAH puts patients at risk of short stature, over treatment because of the glucocorticoid induced inhibition of the growth axis.

CAH is associated with precocious puberty caused by long term exposure to androgens, which activate the hypothalamic-pituitary-gonadal axis.

Similarly, CAH is associated with hyperpigmentation, and hyperreninaemia due to sodium loss and hypovolaemia.

The wolffian duct is never formed in CAH.



[Q: 2489] OnExamination 2012 - Endocrinology

A 30-year-old female presents with a one year history of galactorrhoea. She has been receiving treatment for hay fever, depression, obesity and dyspepsia.

Her investigations reveal:

Full blood count Normal

Urea and electrolytes Normal

Prolactin 820 mU/l (<360)

Free thyroxine (T4) 18.3 pmol/l (10-22)

TSH concentration 2.1 mU/l (0.4-5)

Which one of the following drugs is most likely to explain these findings?

- 1- Astemizole
- 2- Metoclopramide
- 3- Orlistat
- 4- Paroxetine
- 5- Ranitidine

Answer & Comments

Answer: 2- Metoclopramide

Although the selective serotonin reuptake inhibitors (SSRIs) are also rarely associated with hyperprolactinaemia, the answer has to be metoclopramide, which is a dopamine antagonist that is typically associated with hyperprolactinaemia.



[Q: 2490] OnExamination 2012 - Endocrinology

Which one of the following measurements is a test for exocrine pancreatic insufficiency?

- 1- Faecal amylase
- 2- Faecal elastase
- 3- Faecal fat
- 4- Faecal lipase
- 5- Serum lipase

Answer & Comments

Answer: 2- Faecal elastase

Even the secretin stimulation test, which is the most sensitive method of assessing pancreatic exocrine function, is probably abnormal only when more than 60% of exocrine function has been lost.

Non-invasive, indirect tests of pancreatic exocrine function (faecal elastase, serum trypsinogen) are much more likely to give abnormal results in patients with obvious pancreatic disease (for example, pancreatic calcification, steatorrhea, or diabetes mellitus), than in patients with occult disease.



[Q: 2491] OnExamination 2012 - Endocrinology

You are treating a 48-year-old man for acromegaly.

Unfortunately despite adenomectomy, he continues to have an elevated growth hormone. You decide to start a long acting somatostatin analogue, Somatoline LA.

Which of the following correctly describes one aspect of its mode of action?

- 1- High affinity for human somatostatin receptor (HSSR) 3
- 2- Increased prolactin
- 3- Low affinity for human somatostatin receptor (HSSR) 2

- 4- Reduced fasting gastrin secretion
- 5- Reduced meal time superior mesenteric artery blood flow

Answer & Comments

Answer: 5- Reduced meal time superior mesenteric artery blood flow

Somatuline, like most other synthetic somatostatin analogues, has high affinity for HSSR-2 and 5, and low affinity for 1,3, and 4.

It is activity at the 2 and 5 receptors which is thought to be primarily the reason why growth hormone secretion falls.

There is no significant effect of Somatuline on fasting gastrin or secretin secretion.

Prolactin levels are generally reduced by somatostatin use.



[Q: 2492] OnExamination 2012 - Endocrinology

A 54-year-old man who has gained significant amounts of weight over the past six months is referred to the endocrine clinic with suspected Cushing's disease.

He has hypertension and impaired glucose tolerance. On examination his BP is 165/90 mmHg, pulse is 80 and regular and his BMI is 33. As part of the routine work up, a discrete mass is discovered on chest x ray.

When considering further work up, which of the following is the most appropriate option to rule out/in ectopic ACTH production as a cause of Cushing's?

- 1- 24 hour urinary free cortisol
- 2- High dose dexamethasone suppression test
- 3- Low dose dexamethasone suppression test
- 4- Midnight cortisol
- 5- Plasma ACTH

Answer & Comments

Answer: 2- High dose dexamethasone suppression test

All of the other options are possibilities for determining whether there are excess circulating corticosteroids, or there is excess adrenocorticotrophic hormone (ACTH) production.

They are not useful, however, in determining the origin of excess ACTH.



[Q: 2493] OnExamination 2012 - Endocrinology

A 54-year-old woman presents to the clinic with tiredness and a yellow tinge to her skin.

She has increased in weight by a few kg over the past six months.

On examination her BP is 139/70 mmHg, pulse is 64 and regular. Her BMI is 29.

Investigations show:

Haemoglobin 10.9 g/dl (11.5-16.0)

White cell count $7.9 \times 10^9/L$ (4-11)

Platelets $171 \times 10^9/L$ (150-400)

Sodium 133 mmol/l (135-146)

Potassium 4.0 mmol/l (3.5-5)

Creatinine 90 $\mu\text{mol/l}$ (79-118)

Bilirubin 21 $\mu\text{mol/l}$ (<17)

Which of the following is the most likely diagnosis?

- 1- Anorexia nervosa
- 2- Chronic liver disease
- 3- Diabetes mellitus
- 4- Dietary carotene excess
- 5- Hypothyroidism

Answer & Comments

Answer: 5- Hypothyroidism

Anorexia nervosa is associated with hypercarotenaemia but does not fit here with the history of weight gain and elevated BMI.

Diabetes mellitus is also associated with hypercarotenaemia, but the sodium at the lower end of normal is a better pointer towards hypothyroidism as the alternative diagnosis.

Dietary carotene excess is unlikely, and occurs more frequently in children. The normal bilirubin rules this out as a cause of the pigmentation.



[Q: 2494] OnExamination 2012 - Endocrinology

A 37-year-old woman presents with sudden onset painful visual loss in her left eye.

She has a history of previous mononeuritis affecting her left and right common peroneal nerves on separate occasions over the past three years. She has 6/36 vision in her left eye with loss of colour sensitivity.

Which of the following would you be most likely to see on visual evoked potential (VEP) examination of her right eye?

- 1- Delayed latency
- 2- Increased amplitude of the positive peak
- 3- Reduction in the amplitude of the first negative peak
- 4- Reduction in the amplitude of the second negative peak
- 5- Reduction in the amplitude of the positive peak

Answer & Comments

Answer: 1- Delayed latency

Amplitude reduction is seen against a background of retinal disease which interferes with signal transduction.

Amplitude reduction is also seen against a background of refractory errors, but the

question asks about VEP examination of the right eye, where there is no reported loss in visual acuity, so it is purely delayed latency that should be seen.



[Q: 2495] OnExamination 2012 - Endocrinology

A 24-year-old woman presents to the genetics clinic for pre-conception advice. She has a family history of thyroid hormone dysmorphogenesis and wonders what exactly the disorder is.

Which of the following stems best characterises the defect responsible for thyroid hormone dysmorphogenesis?

- 1- Defect in iodine organification
- 2- Defect in thyroid hormone release
- 3- Thyroid hormone releasing hormone receptor mutation
- 4- Thyroxine receptor mutation
- 5- TSH receptor mutation

Answer & Comments

Answer: 1- Defect in iodine organification

Thyroid-stimulating hormone (TSH) receptor mutations occur more commonly in association with other G protein receptor mutations such as those involved in the pathogenesis of pseudohypoparathyroidism.

Other abnormalities leading to congenital hypoparathyroidism include abnormal migration or formation of the gland, not the other stems described in the question.



[Q: 2496] OnExamination 2012 - Endocrinology

A 32-year-old man who is a non-smoker and only occasionally drinks alcohol presents to the outpatient endoscopy unit with worsening symptoms of indigestion.

He was scoped only five months earlier, where multiple gastric ulcers were found and he was started on high dose omeprazole. Helicobacter biopsy was negative. Repeat endoscopy showed further evidence of ulceration.

Investigations showed:

Haemoglobin 10.2 g/dl(13.5-17.7)

White cell count $7.9 \times 10^9/L$ (4-11)

Platelets $210 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (135-146)

Potassium 3.8 mmol/l (3.5-5)

Creatinine 114 $\mu\text{mol/l}$ (79-118)

Glucose 5.2 mmol/l (<7.0)

Calcium 2.98 mmol/l (2.2-2.61)

Which of the following is the most likely diagnosis?

- 1- Gastric carcinoma
- 2- MEN-1
- 3- MEN-2a
- 4- MEN-2b
- 5- Missed Helicobacter infection

Answer & Comments

Answer: 2- MEN-1

There is no evidence of obstruction or a mass on endoscopy which would support a diagnosis of gastric carcinoma.

Equally, negative Helicobacter biopsies, when in fact infection has occurred are highly unlikely.

With respect to MEN-2, it is associated with pheochromocytoma, parathyroid adenoma, and medullary carcinoma of the thyroid.



[Q: 2497] OnExamination 2012 - Endocrinology

A 23-year-old student from central Africa brings her 29-year-old sister who is visiting on

holiday to see the GP because she is concerned about a fullness in her neck.

There is also a history of fatigue, a dry cough and a change in the quality of her voice over the past few months. She has no other past medical history of note; you ask about her diet, she tells you she eats mainly local food and they cannot get access to fresh fish.

On examination her BP is 135/70 mmHg, her pulse is 65 and her BMI is 28. There is a large, diffuse multinodular goitre.

Investigations show:

Haemoglobin 10.8 g/dl (11.5-16.5)

White cells $7.5 \times 10^9/L$ (4-11)

Platelet $179 \times 10^9/L$ (150-400)

Sodium 136 mmol/l (135-146)

Potassium 4.6 mmol/l (3.5-5)

Creatinine 99 $\mu\text{mol/l}$ (79-118)

TSH 6.0 (0.5-5.0)

Which of the following is the most likely diagnosis?

- 1- Graves' disease
- 2- Hashimoto's disease
- 3- Idiopathic hypothyroidism
- 4- Iodine deficiency
- 5- Non-toxic multinodular goitre

Answer & Comments

Answer: 4- Iodine deficiency

Iodine deficiency occurs more commonly in central Africa.

It may present in a euthyroid state, or with severe deficiency, symptoms of hypothyroidism.

Diffuse goitre becomes nodular over time with prolonged deficiency.

Symptoms of extrinsic compression due to goitre size, including shortness of breath and difficulty swallowing may exist.

The presentation here with mild hypothyroidism (thyroid-stimulating hormone [TSH] just outside the normal range) is entirely consistent with this picture.

- A. Graves' is associated with symptoms of thyrotoxicosis so is incorrect.
- B. Hashimoto's would be an alternative consideration here, but the patient's location and relatively indolent course of her disease is designed to point you towards iodine deficiency.
- C. Again, the location should prompt you to consider iodine deficiency, so idiopathic hypothyroidism is the incorrect answer.
- D. Iodine deficiency and the large goitre, coupled with mild hypothyroidism in a patient from central Africa points you to this as the correct option.
- E. Non-toxic multinodular goitre is incorrect because of the clues that point you to iodine deficiency. It would be the default correct answer in another situation.



[Q: 2498] OnExamination 2012 - Endocrinology

A 43-year-old man comes to the clinic, he is known to have primary hypertriglyceridaemia and is managed with high dose statin and fibrate therapy.

He complains of episodes of upper abdominal pain, nausea and vomiting. He has had three or four attacks like this over the past six months. He denies significant alcohol consumption.

On examination his BP is 138/78 mmHg, his pulse is 78 and regular and his BMI is 22. Apart from eruptive xanthomata, there are no other significant findings.

Investigations show:

Haemoglobin 13.3 g/dl(13.5-17.7)

White cells $5.2 \times 10^9/L$ (4-11)

Platelet $244 \times 10^9/L$ (150-400)

Sodium 137 mmol/l (135-146)

Potassium 4.0 mmol/l (3.5-5)

Creatinine 112 $\mu\text{mol/l}$ (79-118)

HDL cholesterol 0.9 mmol/l (0.8-1.8)

LDL cholesterol 2.3 mmol/l (<4.0)

Triglycerides 5.8 mmol/l (0.7-2.1)

Glucose 5.2 mmol/l (<7.0)

Which of the following is the most likely underlying cause?

- 1- Acute pancreatitis
- 2- Chronic pancreatitis
- 3- Chronic stable angina
- 4- Chylomicronaemia syndrome
- 5- Gall bladder disease

Answer & Comments

Answer: 4- Chylomicronaemia syndrome

The answer is D, chylomicronaemia syndrome.

Chylomicronaemia syndrome is recognised in patients with severe hypertriglyceridaemia and causes recurrent episodes of abdominal pain, often accompanied by nausea and vomiting. It occasionally also causes chest or back pain and shortness of breath.

Amylase and lipase during an acute attack are within the normal range or mildly elevated, this helps differentiate an acute attack from acute pancreatitis. They are not shown here because this is a clinic follow up appointment.

He is of course also at risk of accelerated cardiovascular disease.

Yuan G, Al-Shali KZ, Hegele RA. Hypertriglyceridemia: its etiology, effects and treatment. CMAJ. 2007;176(8):1113-1120.



[Q: 2499] OnExamination 2012 - Endocrinology

A 73-year-old male with type 2 diabetes requires improved glycaemic control. He also

suffers from heart failure which is controlled with furosemide, ramipril, and bisoprolol.

Which of the following hypoglycaemic agents is contraindicated in this patient?

- 1- Acarbose
- 2- Glipizide
- 3- Nateglinide
- 4- Metformin
- 5- Pioglitazone

Answer & Comments

Answer: 5- Pioglitazone

Pioglitazone can result in fluid retention of unknown aetiology which may cause a mild dilutional anaemia (haemoglobin typically falls by 1 to 2 g/dL) and ankle oedema. It is contraindicated in congestive heart failure.

Sulphonylureas, acarbose, and nateglinide can be used in patients with heart failure.

To reduce the risk of lactic acidosis, metformin should be avoided in those at risk of tissue hypoxia or sudden deterioration in renal function, such as those with dehydration, severe infection, shock, sepsis, acute heart failure, respiratory failure, or hepatic impairment, or those who have recently had a myocardial infarction.

Although acute heart failure may increase the risk of lactic acidosis with metformin, this patient's heart failure appears to be controlled, and metformin may be used with caution.



[Q: 2500] OnExamination 2012 - Endocrinology

A 17-year-old girl presents with vomiting and her investigations show:

Sodium 120 mmol/L(137-144)

Potassium 3.0 mmol/L(3.5-4.9)

Urea 2.2 mmol/L(2.5-7.5)

Urine sodium 2 mmol/L

Urine osmolality 700 mosmol/kg(350-1000)

What is the most likely diagnosis?

- 1- Addison's disease
- 2- Bulimia nervosa
- 3- Diuretic abuse
- 4- Syndrome of inappropriate antidiuretic hormone secretion
- 5- Water intoxication

Answer & Comments

Answer: 2- Bulimia nervosa

This patient is likely to have bulimia - young girl with a likely low body mass contributing to the low urea, vomiting contributing to the hypokalaemia/hyponatraemia.

Her urine sodium is appropriately low and due to a relative dehydration she has appropriately concentrated urine.

This is not Addison's disease as urine sodium would be high with high urea and likely high potassium.

Similarly it is not SIADH due to the low urine sodium.

Diuretic abuse would cause high urine sodium.

Water intoxication would produce a dilute urine.



[Q: 2501] OnExamination 2012 - Endocrinology

A 40-year-old obese man with a BMI of 36 kg/m² was diagnosed with type 2 diabetes mellitus one year ago. He is now eating a healthy diet and getting sufficient exercise.

He did not report any osmotic symptoms and so far had been free from any micro- or macrovascular complications. He is currently not taking any medications.

Investigations at his annual diabetic follow-up were as follows:

Haemoglobin A_{1c} 7.4 % (3.8-6.4)

Fasting plasma glucose 9.8 mmol/l (3.0-6.0)

Serum Sodium 138 mmol/l (137-144)

Serum Potassium 4.7 mmol/l (3.5-4.9)

Serum urea 4.3 mmol/l (2.5-7.5)

Serum creatinine 88 µmol/l (60-110)

What would be the most appropriate management to optimise his glycaemic control?

- 1- Continue with lifestyle measures
- 2- Gliclazide therapy
- 3- Metformin therapy
- 4- Orlistat therapy
- 5- Pioglitazone therapy

Answer & Comments

Answer: 3- Metformin therapy

This obese male has sub-optimal control of his hyperglycaemia (HbA_{1c} 7.4%) despite diet.

One should aim for a HbA_{1c} below 7% and so the addition of metformin would be the most appropriate choice for this man.



[Q: 2502] OnExamination 2012 - Endocrinology

A 68-year-old woman presented to her general practitioner with a history of generalised tiredness.

She had recently been commenced on a water tablet to ease her swollen feet. She was also diagnosed with glaucoma for which she used topical eye drops.

Investigations showed:

Serum Sodium 138 mmol/L (137-144)

Serum potassium Haemolysed sample

Serum urea 4.3 mmol/L (2.5-7.5)

Serum creatinine 88 µmol/L (60-110)

Serum corrected Calcium 2.68 mmol/L (2.2-2.6)

Which diuretic was this lady most probably taking?

- 1- Acetazolamide
- 2- Amiloride
- 3- Bendroflumethiazide
- 4- Furosemide
- 5- Indapamide

Answer & Comments

Answer: 3- Bendroflumethiazide

Thiazide diuretics are associated with increased calcium concentrations as well as raised urate.



[Q: 2503] OnExamination 2012 - Endocrinology

A 54-year-old male who is a HGV driver and has a 10 year history of type 2 diabetes is seen on annual review.

His glycaemic control is poor with a HbA_{1c} of 10.5% on maximal oral hypoglycaemic therapy (3.8-6.4). You suggest switching to insulin but he refuses to do this as he would lose his HGV licence. He also refuses to inform the DVLA himself.

What is the most appropriate action in this case?

- 1- Continue to review patient in clinic and accept that he continues to drive
- 2- Discharge him from clinic as there is nothing more that you can do
- 3- Inform his employer that he must stop driving and suggest administrative work
- 4- Inform the DVLA even if the patient withholds his consent
- 5- Tell his next of kin that they should inform the DVLA that he is no longer fit to drive

Answer & Comments

Answer: 1- Continue to review patient in clinic and accept that he continues to drive

In this particular case, the patient has poor glycaemic control, but otherwise has no features whatsoever that preclude him from driving such as retinopathy, neuropathy or hypoglycaemic episodes. You cannot therefore force this patient to switch to insulin and neither can you stop him driving. He will continue to need a regular medical every three years for his continued HGV licence.



[Q: 2504] OnExamination 2012 - Endocrinology

A 70-year-old male with a history of syncope and hypertension is found to have runs of non-sustained ventricular tachycardia during telemetry.

Investigations show a serum magnesium of 0.4 mmol/l (0.75-1.05).

Which one of the following is most likely to be responsible for this biochemical abnormality?

- 1- Chronic renal failure
- 2- Diuretic therapy
- 3- Elevated PTH concentrations
- 4- Hyperphosphataemia
- 5- Treatment with antacids

Answer & Comments

Answer: 2- Diuretic therapy

Diuretic therapy is a common cause of hypomagnesaemia due to increased renal excretion. It is not seen in hyperparathyroidism.

Chronic renal failure and antacid therapy are both causes of hypermagnesaemia.

Hypophosphataemia is seen in association with hypomagnesaemia.



[Q: 2505] OnExamination 2012 - Endocrinology

A 44-year-old female presents with features suggestive of Cushing's syndrome.

Initial investigations reveal a 24 hour urine free cortisol concentration of 350 nmol/day (<250).

Which is the most appropriate investigation of this patient's suspected Cushing's syndrome?

- 1- 9 am and midnight cortisol
- 2- ACTH concentration
- 3- High dose dexamethasone suppression test
- 4- Low dose dexamethasone suppression test
- 5- Short Synacthen test

Answer & Comments

Answer: 4- Low dose dexamethasone suppression test

This patient is clinically suspected to have Cushing's syndrome with the diagnosis being supported by elevated urine free cortisol concentrations.

However, the diagnosis of hypercortisolism needs to be established and the best way of doing this is with a low dose dexamethasone suppression test (DXM 0.5 mg qds for two days). The high dose test (2 mg qds for two days) adds little diagnostic value over and above the low dose test.

9 am and midnight cortisol concentrations would not add much to the suspicion of hypercortisolism which is provided by the urine free cortisol.

Short Synacthen tests are used to assess for hypoadrenalism.

A CRF test is used occasionally to distinguish between ectopic and pituitary dependent Cushing's.

Adrenocorticotrophic hormone (ACTH) concentrations would also be valuable after

the diagnosis is confirmed to assess for ACTH dependency.



[Q: 2506] OnExamination 2012 - Endocrinology

An 18-year-old male presented with delayed pubertal development. He had always noted an impaired sense of smell.

Examination revealed that his height was on 90th centile and his weight on the 90th centile. His external genitalia showed a small penis with testicular volumes of 3 mL bilaterally and no pubic hair.

Investigations revealed:

LH concentration 1.0 U/L(1-10)

FSH concentration 1.0 U/L(1-7)

Serum testosterone 3.0 pmol/L(9-35)

Free T₄ 19 pmol/L(10-22)

TSH 3.0 mU/L(0.4-5)

CT scan reported as normal.

What is the most likely diagnosis?

- 1- Constitutional delay of puberty
- 2- Kallmann's syndrome.
- 3- Klinefelter's syndrome.
- 4- Noonan's syndrome.
- 5- Prader-Willi syndrome.

Answer & Comments

Answer: 2- Kallmann's syndrome.

The combination of hypogonadotrophic hypogonadism and anosmia would suggest a diagnosis of Kallmann's syndrome.

This is one of the commonest causes of isolated hypogonadotrophic hypogonadism and is due to a failure of migration of the olfactory neurones and gonadotropin-releasing hormone (GnRh) neurones during development.



[Q: 2507] OnExamination 2012 - Endocrinology

A 53-year-old male is suspected of having acromegaly.

Which of the following is the best investigation to confirm the diagnosis?

- 1- 9 am growth hormone (GH) concentrations
- 2- An insulin tolerance test with growth hormone concentrations
- 3- Glucose tolerance test with growth hormone concentrations
- 4- Growth hormone releasing hormone test
- 5- Insulin-like growth factor-1 (IGF-1)

Answer & Comments

Answer: 3- Glucose tolerance test with growth hormone concentrations

The diagnosis of acromegaly is confirmed by inadequate suppression of GH concentrations below 2 mU/l in an oral glucose tolerance test.

Although IGF-1 concentrations are elevated these are not diagnostic and may fall during illness.



[Q: 2508] OnExamination 2012 - Endocrinology

Which of the following is true of the thyroid hormone receptor?

- 1- A cell surface receptor
- 2- A cytoplasmic protein
- 3- A gated ion channel
- 4- A G protein coupled receptor
- 5- A nuclear receptor

Answer & Comments

Answer: 5- A nuclear receptor

The thyroid hormone receptor is a nuclear receptor.

When it binds tri-iodothyronine (T3) it is able to bind to the thyroid hormone response element (TRE) in the promoter region of thyroid hormone responsive genes and initiates transcription.



[Q: 2509] OnExamination 2012 - Endocrinology

A 64-year-old male presents with difficulty in micturition.

He is diagnosed with benign prostatic hyperplasia and elects to receive finasteride.

Production of which of the following hormones would be selectively inhibited?

- 1- Androstenedione
- 2- Dihydroepiandrosterone sulphate (DHEAS)
- 3- Dihydrotestosterone (DHT)
- 4- IGF-1
- 5- Testosterone

Answer & Comments

Answer: 3- Dihydrotestosterone (DHT)

Finasteride is a 5 alpha-reductase inhibitor and inhibits the conversion of testosterone to the active DHT.



[Q: 2510] OnExamination 2012 - Endocrinology

Leptin:

- 1- Acts upon the adipocyte
- 2- Is synthesised in the hypothalamus
- 3- Plasma concentrations correlate directly with lean body mass.
- 4- Produces satiety
- 5- Reduces basal metabolic rate

Answer & Comments

Answer: 4- Produces satiety

Leptin is synthesised within the adipocyte and plasma concentrations are directly related to adipocyte (fat) mass.

It acts on centres within the hypothalamus to produce satiety.



[Q: 2511] OnExamination 2012 - Endocrinology

In active acromegaly with associated diabetes mellitus which of the following findings would be expected?

- 1- Diabetes mellitus is due to an auto-immune process
- 2- Growth hormone concentrations are suppressed with hyperglycaemia
- 3- IGF-1 concentrations are low
- 4- There is insulin resistance
- 5- Treatment with a somatostatin analogue is contraindicated

Answer & Comments

Answer: 4- There is insulin resistance

Insulin resistance stems from the excessive growth hormone (GH) concentrations (anti-insulin effects) that of course fail to suppress with hyperglycaemia.

Acromegaly is often effectively treated with somatostatin analogues which may improve glycaemic control.

Many of the effects of GH are mediated through insulin-like growth factor-1 (IGF-1), concentrations of which are high in acromegaly.

Diabetes mellitus is due to the insulin resistance and is not due to auto-immune insulinitis.



[Q: 2512] OnExamination 2012 - Endocrinology

A 52-year-old female presents with tiredness.

There are no specific abnormalities noted on examination, but investigations reveal:

T₄ 21.1 pmol/L (10-22)

T₃ 5.2 pmol/L (5-10)

TSH 0.05 mU/L (0.4-5)

Thyroid autoantibody titres are all undetectable.

Of what do these results suggest a diagnosis?

- 1- DeQuervain's thyroiditis
- 2- Graves' disease
- 3- Hashimoto's thyroiditis
- 4- Sick euthyroid syndrome
- 5- Solitary toxic nodule

Answer & Comments

Answer: 5- Solitary toxic nodule

This patient has subclinical hyperthyroidism and, in the absence of thyroid auto-antibodies, the most probable explanation of these thyroid function abnormalities is a solitary toxic nodule.



[Q: 2513] OnExamination 2012 - Endocrinology

A 42-year-old woman who is known to have Hashimoto's thyroiditis presents to the clinic with muscle pains and fatigue, and pins and needles affecting her hands intermittently. She takes no regular medication apart from thyroxine replacement.

Clinical examination is unremarkable.

Investigations show:

Haemoglobin 12.2 g/dl(11.5-16.0)

White cell count $6.4 \times 10^9/L$ (4-11)

Platelets $190 \times 10^9/L$ (150-400)

Sodium 141 mmol/l (135-146)

Potassium 4.7 mmol/l (3.5-5)

Creatinine 108 $\mu\text{mol/l}$ (79-118)

Calcium 2.05 mmol/l (2.20-2.61)

Phosphate 1.65 mmol/l (0.8-1.5)

Alkaline phosphatase 62 U/l (39-117)

Which of the following is the most appropriate way to manage her symptoms?

- 1- Calcitonin
- 2- Calcium and vitamin D3
- 3- Cinacalcet
- 4- PTH analogue
- 5- Risedronate

Answer & Comments

Answer: 2- Calcium and vitamin D3

The blood picture raises the possibility of osteomalacia, as such calcium and vitamin D are most appropriate.

Calcitonin is licensed for the treatment of osteoporosis and is therefore not appropriate here.

Cinacalcet is appropriate for the treatment of tertiary hyperparathyroidism where the patient cannot undergo surgery, such as occurs in chronic kidney disease.

Parathyroid hormone (PTH) analogues are used in the treatment of osteoporosis, as is risedronate.



[Q: 2514] OnExamination 2012 - Endocrinology

A 54-year-old woman presents to the clinic with hypercalcaemia detected at GP screening.

She has no significant medical history apart from mild hypertension for which she has been advised by the GP to lose weight.

On examination her BP is 150/90 mmHG, her BMI is 29. General physical examination is unremarkable.

Investigations show:

Haemoglobin 11.5 g/dl(11.5-16.0)

White cell count $5.6 \times 10^9/L$ (4-11)
 Platelets $168 \times 10^9/L$ (150-400)
 Sodium 139 mmol/l (135-146)
 Potassium 4.2 mmol/l (3.5-5)
 Creatinine 110 micromol/l (79-118)
 PTH 12.2 micromol/l
 Hip T score -2.7

Which of the following treatments should she be offered?

- 1- Cinacalcet
- 2- Furosemide
- 3- Risedronate
- 4- Surgical referral
- 5- Vitamin D

Answer & Comments

Answer: 4- Surgical referral

Guidelines from the NIH on the management of primary hyperparathyroidism suggest that this patient should be offered surgery.

Considerations for surgery include:

Serum albumin-adjusted calcium greater than 0.25 mmol/L above the upper limit of local laboratory reference range

Twenty four hour total urinary calcium excretion greater than 10 mmol (400 mg)

Creatinine clearance reduced by 30% or more

Bone mineral density T score less than -2.5 (at any site)

Age younger than 50 years

Patient request; adequate follow-up unlikely.

This woman fulfils the guidelines due to osteoporosis.

Risedronate is incorrect because this patient already fulfils the diagnosis of osteoporosis and as such should be offered surgery in the first instance.

Cinacalcet is incorrect because it should be only offered in patients with tertiary hyperparathyroidism who are unfit for surgery.

Furosemide may be useful in situations of acute hypercalcaemia, and vitamin D is a treatment for secondary hyperparathyroidism.



[Q: 2515] OnExamination 2012 - Endocrinology

An 18-year-old man comes to the endocrine clinic for review. He has been followed up since entering puberty at the age of 10. There are visible bony deformities and he walks slowly with a stick.

On examination his BP is 148/82 mmHg, pulse is 70 and regular. He has a number of café au lait spots. There are obvious multiple healed fractures.

Investigations show:

Haemoglobin 13.2 g/dl (13.5-17.7)

White cell count $7.3 \times 10^9/L$ (4-11)

Platelets $160 \times 10^9/L$ (150-400)

Sodium 140 mmol/l (135-146)

Potassium 4.1 mmol/l (3.5-5)

Creatinine 103 micromol/l (79-118)

TSH 0.3 IU (0.5-4.5)

Alkaline phosphatase 230 U/l (39-117)

Calcium 2.2 mmol/l (2.20-2.61)

Which of the following is the most likely diagnosis?

- 1- Autoimmune polyglandular syndrome
- 2- McCune-Albright syndrome
- 3- Neurofibromatosis type 2
- 4- Neurofibromatosis type 1
- 5- Osteomalacia

Answer & Comments

Answer: 2- McCune-Albright syndrome

The diagnosis of McCune-Albright is established on clinical grounds, with the presence of precocious puberty, bony fibromas leading to possible pathological fractures, thyrotoxicosis, and cafe au lait spots all supporting this as the underlying cause.

Autoimmune polyglandular syndrome leads to multiple hormone deficiencies, including Addison's, hypothyroidism, and hypoparathyroidism.

Whilst neurofibromatosis is a cause of cafe au lait spots, it is not usually a cause of precocious puberty and other endocrine abnormalities such as the thyrotoxicosis seen here.

Osteomalacia can occur as a consequence of McCune-Albright, but is not the primary diagnosis seen here.



[Q: 2516] OnExamination 2012 - Endocrinology

A 61-year-old woman comes to the clinic.

She currently takes metformin 1 g twice daily and gliclazide 160 mg twice daily. On examination her blood pressure is 155/90 mmHg, her BMI is 29.

Her general practitioner is concerned as he has noticed a rise in her creatinine to 138.

Investigations in clinic show:

Haemoglobin 11.9 g/dl(13.5-18)

White cell count $5.0 \times 10^9/L$ (4-10)

Platelets $193 \times 10^9/L$ (150-400)

Sodium 140 mmol/l (134-143)

Potassium 5.0 mmol/l (3.5-5)

Creatinine 142 $\mu\text{mol/l}$ (60-120)

HbA1c 7.2%(<5.5)

Glomerular filtration rate 38 ml/min(>90)

Which of the following is the correct course of action with regard to her metformin?

- 1- Continue her metformin
- 2- Stop her metformin and consider acarbose
- 3- Stop her metformin and consider exenatide
- 4- Stop her metformin and consider insulin
- 5- Stop her metformin and continue the gliclazide

Answer & Comments

Answer: 1- Continue her metformin

Impaired renal function leads to decreased clearance of metformin, and an increased risk of lactic acidosis. NICE has therefore released guidelines regarding the use of metformin in patients with renal impairment.

Clinical circumstances should be reviewed when the eGFR falls below 45mL/min/1.73m² (or the serum creatinine exceeds 130 $\mu\text{mol/L}$). metformin should then be stopped if the serum creatinine exceeds 150 $\mu\text{mol/L}$ (or eGFR is below 30mL/min/1.73m²).

Metformin may be continued (or initiated) with an eGFR less than 60mL/min/1.73m², but renal function should be monitored closely (every 3-6 months).

The dose of metformin should be reviewed and reduced in those with an eGFR of less than 45mL/min/1.73m², and renal function should be monitored every three months. Metformin should not be initiated in patients as this stage however.

The drug should be stopped once eGFR falls to less than 30mL/min/1.73m² (creatinine more than 150 $\mu\text{mol/L}$).

Caution should be taken in patients with anticipated significant fluctuations in renal function, or those at risk of abrupt deterioration in function (based on history, co-morbidities, proteinuria and other medications).

In this case the eGFR is more than 30mL/min/1.73m², and the creatinine is less than 150μmol/L, therefore metformin can be continued (albeit at a reduced dose). Further review of her medication is likely to be needed due to her raised HbA1c, however this is not what the question asks.



[Q: 2517] OnExamination 2012 - Endocrinology

A 60-year-old woman with type 2 diabetes comes to the clinic three months after adding a daily injection of long-acting insulin to her regime.

She has had type 2 diabetes for some six years, and also takes metformin 1 g BD, ramipril 10 mg, aspirin 75 mg and atorvastatin 10 mg.

You review her results, and her average morning fasting sugar is 5.9 mmol/L. Unfortunately, her pre-lunch glucose is consistently out of range, at around 9.5 mmol/L.

Which of the following is the correct intervention according to the ADA/EASD consensus algorithm 2006?

- 1- Add a pre-breakfast injection of NPH insulin
- 2- Add a pre-breakfast injection of rapid acting insulin
- 3- Add a pre-lunch injection of NPH insulin
- 4- Add a pre-lunch injection of rapid acting insulin
- 5- Add a pre-dinner injection of NPH insulin

Answer & Comments

Answer: 2- Add a pre-breakfast injection of rapid acting insulin

This is the course of action recommended by the consensus.

It seems with a pre-lunch glucose level of 9.5, that there is a significant post-breakfast peak in glucose levels. As such, the best way to

manage this is with a breakfast time injection of rapid acting insulin.

The consensus does not recommend using BD pre-mixed preparations until the need for rapid acting insulin and any necessary dose titration has been adequately assessed.



[Q: 2518] OnExamination 2012 - Endocrinology

A 30-year-old woman who is 24 weeks pregnant presents with a blood pressure on three separate occasions of approximately 160/110 mmHg.

Her liver function tests (LFTs) show:

Aspartate transaminase 150 U/L (5-45)

Alkaline phosphatase 213 U/L (50-120)

Bilirubin 31 μmol/L (0-18)

Which antihypertensive is indicated?

- 1- Atenolol
- 2- Irbesartan
- 3- Labetalol
- 4- Methyldopa
- 5- Ramipril

Answer & Comments

Answer: 3- Labetalol

Angiotensin-converting enzyme inhibitors are contraindicated in pregnancy as they cause renal dysgenesis in the fetus. For this reason A2RBs are also not recommended for use in pregnancy.

There is a theoretical risk of intrauterine growth retardation with the use of atenolol in pregnancy although the studies which showed this effect were done with very large doses of atenolol.

One would not utilise methyldopa in a patient with abnormal LFTs.



[Q: 2519] OnExamination 2012 - Endocrinology

A 35-year-old woman presents with episodic sweats associated with hunger. She was otherwise well and had gained some weight recently.

Investigations reveal normal urea and electrolytes, liver function tests and full blood count. An overnight fasting plasma glucose is 3.8 mmol/l (3.0-6.0).

What is the most appropriate investigation for this patient?

- 1- 24 hour ECG recording
- 2- 72 hour fast
- 3- Fasting insulin and C peptide concentrations
- 4- MR scan of pancreas
- 5- Short Synacthen test

Answer & Comments

Answer: 2- 72 hour fast

This patient presents with features suggestive of spontaneous hypoglycaemia often due to an insulinoma. She requires confirmation of the suspected diagnosis and this should be undertaken with a 72 hour fast.

If the patient develops symptoms then a plasma glucose is measured and if low, insulin, and C peptide is then collected and the fast terminated.

We have been provided with a fasting plasma glucose on this patient which is normal.

Measuring insulin and C peptides with this normal glucose would provide no meaningful information. First we have to see whether she actually becomes hypoglycaemic.



[Q: 2520] OnExamination 2012 - Endocrinology

Which of the following suggests a diagnosis of familial combined hyperlipidaemia (FCHL)?

rather than heterozygous familial hypercholesterolaemia (FH)?

- 1- Absence of hyperuricaemia
- 2- Presence of arcus senilis
- 3- Presence of glucose intolerance
- 4- Strong family history of premature coronary artery disease
- 5- Tendon xanthomas

Answer & Comments

Answer: 3- Presence of glucose intolerance

The genetic dyslipidaemias occur in one third of patients who have suffered from their first myocardial infarction below the age of 50 years in men.

The commonest is familial combined hyperlipidaemia (two thirds), with a fifth due to familial hypercholesterolaemia. The former can be diagnosed only on family studies, and there is elevation of fasting plasma triglycerides not associated with hyperchylomicronaemia.

It is autosomal dominant, and some family members may have hyperchylomicronaemia.

Only 20% of children have elevated triglycerides before the age of 25.

Obesity, insulin resistance, hyperinsulinaemia, glucose intolerance, and hyperuricaemia are associated.

Heterozygous familial hypercholesterolaemia is dominantly inherited, and results from defects in the low-density lipoprotein (LDL) receptor. The most important clinical manifestation is premature coronary artery disease, particularly with onset between the third or fourth decade.

Tendon xanthomata and arcus cornea are rarely present in children, but are very important signs to identify.



[Q: 2521] OnExamination 2012 - Endocrinology

A 45-year-old male with type 1 diabetes and with a number of complex diabetic gastrointestinal complications is noted to have a PR interval of 0.18 s, a QRS duration of 0.1 s and a QT interval of 0.48 s on routine ECG.

Which of the following drugs may be responsible?

- 1- Cimetidine
- 2- Co-trimoxazole
- 3- Domperidone
- 4- Erythromycin
- 5- Octreotide

Answer & Comments

Answer: 4- Erythromycin

Erythromycin has been associated with prolonged QT interval and torsades de pointes and is used in diabetic gastropathy, although its benefits in the condition are not entirely understood.

Prolonged QT is defined as greater than 0.45 s.

Other agents include amitriptyline and phenothiazines yet metoclopramide and domperidone are not associated.



[Q: 2522] OnExamination 2012 - Endocrinology

A 16-year-old male presents with a day history of malaise, weakness and vomiting. He was diagnosed with insulin-dependent diabetes mellitus three years previously.

Which one of the following supports a diagnosis of diabetic ketoacidosis (DKA)?

- 1- Abdominal pain at onset
- 2- A serum standard bicarbonate of 10 mmol/l (NR 22-26)

- 3- A random serum glucose 14 mmol/l (NR 4.5-6-4)
- 4- Decreased appetite in the past few days
- 5- Shallow respirations

Answer & Comments

Answer: 2- A serum standard bicarbonate of 10 mmol/l (NR 22-26)

A. This is an unusual but recognised feature, particularly in children. However it does not support a diagnosis of DKA.

B. The low plasma bicarbonate is highly suggestive of a metabolic acidosis.

C. 'Normoglycaemic DKA' can occur and a glucose of 14 is compatible with a diagnosis, but is not suggestive as one might expect to find these sort of concentrations with diabetes per se.

D. Usually patients are unwell with infections and anorexia. Fasting is itself associated with the presence of ketones in the urine but not necessarily ketoacidosis.

E. Respiratory compensation leads to rapid deep (Kussmaul's) breathing.



[Q: 2523] OnExamination 2012 - Endocrinology

Growth hormone deficiency (GHD) is noted in which of the following?

- 1- Chronic renal failure (CRF)
- 2- Constitutional short stature
- 3- Laron's syndrome
- 4- Sheehan's syndrome
- 5- Turner's syndrome

Answer & Comments

Answer: 4- Sheehan's syndrome

Sheehan's syndrome is post-delivery infarction of the pituitary and GHD is typical.

Although GH therapy is used in CRF, Turner's syndrome and short stature subjects are not GH deficient.

Laron's syndrome is due to a GH receptor defect with impaired IGF-1 production.



[Q: 2524] OnExamination 2012 - Endocrinology

A 58-year-old man comes to the diabetes clinic for review. He has had type 2 diabetes for eight years and has troublesome neuropathy with pain and burning in both lower limbs for long periods of the night.

Current medication for his diabetes includes metformin 1 g BD and gliclazide 80 mg BD.

On examination his BP is 145/85 mmHg, his pulse is 80 and regular. He has glove and stocking neuropathy with sensory loss to the mid shin.

Investigations show:

Haemoglobin 12.3 g/dl(13.5-17.7)

White cell count $7.1 \times 10^9/L$ (4-11)

Platelets $203 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 3.9 mmol/l (3.5-5)

Creatinine 90 $\mu\text{mol/l}$ (79-118)

HbA1c 7.3%(<5.5)

Which of the following is the most appropriate way to manage his pain?

- 1- Amitriptyline
- 2- Axsain cream
- 3- Carbamazepine
- 4- Duloxetine
- 5- Gabapentin

Answer & Comments

Answer: 4- Duloxetine

Amitriptyline is first line therapy for diabetic neuropathy only if duloxetine is contraindicated.

Axsain cream, whilst an effective topical agent is not recommended by NICE.

Second line therapy of choice according to NICE is pregabalin, which may be used in combination with amitriptyline.



[Q: 2525] OnExamination 2012 - Endocrinology

A 52-year-old woman presents to the clinic complaining of intense paroxysms of pain affecting her left cheek, which can last anything from 30 seconds to several minutes. She says that these can come on at any time but may be triggered by activities like going out on a cold day or using her hair dryer.

She has no past medical history of note. Clinical examination is entirely normal.

Investigations show:

Haemoglobin 11.9 g/dl(11.5-16.0)

White cell count $8.0 \times 10^9/L$ (4-11)

Platelets $203 \times 10^9/L$ (150-400)

Sodium 137 mmol/l (135-146)

Potassium 3.9 mmol/l (3.5-5)

Creatinine 110 $\mu\text{mol/l}$ (79-118)

Which of the following would be the most appropriate option to manage these episodes of pain?

- 1- Amitriptyline
- 2- Carbamazepine
- 3- Diclofenac
- 4- Paracetamol
- 5- Tramadol

Answer & Comments

Answer: 2- Carbamazepine

Amitriptyline is not the correct answer because the evidence for its use in trigeminal neuralgia is weak.

Equally, non-steroidals, opiates and paracetamol are not as effective as anti-convulsants such as carbamazepine or gabapentin.

Topical agents have proved disappointing in the management of the condition.



[Q: 2526] OnExamination 2012 - Endocrinology

A 57-year-old woman presents with a temperature of 39.6°C, tachycardia and jaundice.

Her husband tells you that she has been increasingly confused and agitated over the past few days. Her only past history of note is an inguinal hernia repair in the previous week.

On examination her BP is 105/70 mmHg, her pulse is 130, atrial fibrillation, she has jaundiced sclerae. She is agitated and poorly compliant with the examination.

Investigations show:

Haemoglobin 10.9 g/dl(11.5-16.0)

White cell count $10.8 \times 10^9/L$ (4-11)

Platelets $190 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 4.0 mmol/l (3.5-5)

Creatinine 120 $\mu\text{mol/l}$ (79-118)

Alanine aminotransferase 78 U/l (5-40)

Bilirubin 72 $\mu\text{mol/l}$ (<17)

TSH <0.05 IU/l (0.5-4.5)

Which of the following treatments is likely most rapidly to impact on her symptoms?

- 1- Carbimazole
- 2- Diclofenac
- 3- Potassium iodide
- 4- Prednisolone

5- Propylthiouracil

Answer & Comments

Answer: 3- Potassium iodide

Whilst both carbimazole and propylthiouracil are reasonable options for the control of thyrotoxicosis they take longer to exert their effect than potassium iodide.

Non-steroidals are used in the treatment of subacute thyroiditis with prednisolone an option in patients who fail to respond.



[Q: 2527] OnExamination 2012 - Endocrinology

An 18-year-old woman comes to the clinic complaining of acne and hirsutism. She has no medical history of note and her only medication is the oral contraceptive pill.

On examination her BP is 140/82 mmHg, pulse is 80 and regular and her BMI is 28. There are obvious features of virilisation.

Investigations show:

Haemoglobin 12.0 g/dl(11.5-16.0)

White cell count $5.4 \times 10^9/L$ (4-11)

Platelets $200 \times 10^9/L$ (150-400)

Sodium 135 mmol/l (135-146)

Potassium 5.2 mmol/l (3.5-5)

Creatinine 110 $\mu\text{mol/l}$ (79-118)

LH/FSH ratio normal

Which of the following is most likely to be elevated?

- 1- 17-OH progesterone
- 2- 21-OH progesterone
- 3- Aldosterone
- 4- Cortisol
- 5- Urinary 21-ketosteroids

Answer & Comments

Answer: 1- 17-OH progesterone

21-hydroxylase deficiency leads to a reduction rather than an elevation in aldosterone and cortisol levels. Due to the enzyme block, cortisol cannot be made effectively and androgens are made instead.

Urinary 17-ketosteroid levels (androgen metabolites) are elevated in the condition.

21-OH progesterone levels are not elevated in congenital adrenal hyperplasia (CAH).



[Q: 2528] OnExamination 2012 - Endocrinology

A 45-year-old man is admitted with drowsiness and confusion. According to a neighbour he has been complaining of increasing problems with thirst and passing large volumes of urine over the past few days.

On examination his BP is 100/60 mmHg, his pulse is 95 and regular, and he has signs of a right lower respiratory tract infection.

Whilst you are examining him a nurse checks his finger prick glucose which is measured at 36.2 mmol/l.

Which of the following investigations would be most suggestive of a diagnosis of diabetic ketoacidosis?

- 1- Amylase 400 U/l
- 2- Bicarbonate 24 mmol/l
- 3- Lactate 1.6 mmol/l
- 4- Right lower lobe consolidation on chest x ray
- 5- Urinary tract infection on urine screen

Answer & Comments

Answer: 1- Amylase 400 U/l

A raised amylase in the absence of frank pancreatitis is common in patients with diabetic ketoacidosis (DKA), indeed many patients complain of a degree of abdominal pain at the time of presentation. No specific

management is required and amylase falls with rehydration and control of blood glucose.

Bicarbonate of 24 and lactate of 1.6 would both count against a diagnosis of ketoacidosis and favour an alternative such as hyperosmolar non-ketotic (HONK) hyperglycaemia.

Infection can precipitate presentation with HONK or DKA, therefore again possible urine infection or pneumonia would not be useful differentiators here.



[Q: 2529] OnExamination 2012 - Endocrinology

A 16-year-old girl comes to the clinic for review with primary amenorrhoea. Apart from surgery for hernias as an infant, she has no significant past medical history.

On examination she is 1.65 m in height and has a BP of 110/70 mmHg, her pulse is 64 and regular. She has relatively normal breast development but sparse body hair and no secondary sexual hair. Her external genitalia look normal.

Investigation shows:

Haemoglobin 12.8 g/dl (11.5-16.0)

White cell count $6.0 \times 10^9/L$ (4-11)

Platelets $192 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (135-146)

Potassium 4.6 mmol/l (3.5-5)

Creatinine 80 $\mu\text{mol/l}$ (79-118)

Urea 5.2 mmol/l (2.5-6.7)

Testosterone 15 nmol/l (11-40)

Which of the following is the most likely diagnosis?

- 1- Androgen insensitivity syndrome (AIS)
- 2- Kallman's syndrome
- 3- Klinefelter's syndrome
- 4- Noonan's syndrome
- 5- Turner's syndrome

Answer & Comments

Answer: 1- Androgen insensitivity syndrome (AIS)

Kallman's syndrome is associated with failure of the olfactory bulb to develop, leading to loss of gonadotropin releasing hormones.

Klinefelter's is associated with male phenotype, and an XXY karyotype.

Noonan's is associated with short stature and a similar phenotype to Turner's in women, although patients with Noonan's do have normal female organs. In males Noonan's may be associated with delayed puberty.

Turner's is associated with XO karyotype, absent uterus and streak ovaries.



[Q: 2530] OnExamination 2012 - Endocrinology

A 52-year-old woman with a history of type 2 diabetes comes to the clinic for review.

She is currently managed with metformin 1 g BD with respect to glucose control, and her only other medication at the moment is lisinopril 20 mg daily and simvastatin 40 mg.

On examination her BP is 138/82 mmHg, her pulse is 82 and regular. Her BMI is 27 kg/m².

Investigations show:

Haemoglobin 11.4 g/dl(11.5-16.5)

White cells 7.3 x 10⁹/L (4-11)

Platelet 184 x 10⁹/L (150-400)

Sodium 140 mmol/l (135-146)

Potassium 4.8 mmol/l (3.5-5)

Creatinine 119 µmol/l (79-118)

HDL cholesterol 0.9 mmol/l (1.0-2.3)

LDL cholesterol 3.9 mmol/l (<4.0)

Triglycerides 3.1 mmol/l (0.5-1.7)

HbA1c 9.3% (<5.5)(89 mmol/mol)(<36)

Which of the following is the most appropriate initial step to impact on her triglycerides?

- 1- Additional blood glucose lowering therapy
- 2- Exercise programme
- 3- Fibrate therapy
- 4- High dose statin therapy
- 5- Omega 3 fatty acid supplementation

Answer & Comments

Answer: 1- Additional blood glucose lowering therapy

The answer is A, additional blood glucose lowering therapy.

Under-treatment with respect to blood glucose lowering therapy leads to hypertriglyceridaemia and raised HbA1c. As such the first priority in this patient is to improve her glucose control with a second oral agent.

JBS2 guidelines suggest that all patients with type 2 diabetes should be prescribed a statin, even if their cholesterol is within the target range, although statin therapy impacts most on low-density lipoprotein (LDL) cholesterol.

In patients with type 2 diabetes who have hypertriglyceridaemia despite optimal glucose control and statin therapy, treatments targeted for triglyceride reduction, such as niacin, fibrates or omega-3 fatty supplementation should be considered.



[Q: 2531] OnExamination 2012 - Endocrinology

A 32-year-old woman treated with hydrocortisone 10 mg in the morning and 10 mg in the evening for Addison's disease, presents to the clinic with poor compliance.

She feels that the hydrocortisone upsets her stomach and wants to switch to enteric coated prednisolone.

What would be the appropriate corresponding daily dose of prednisolone?

- 1- 4 mg daily

- 2- 5 mg daily
- 3- 7 mg daily
- 4- 10 mg daily
- 5- 15 mg daily

Answer & Comments

Answer: 2- 5 mg daily

The approximate equivalent glucocorticoid action of prednisolone to hydrocortisone is 4:1.

Hence the equivalent dose for 20 mg of hydrocortisone is roughly 5 mg per day of prednisolone.

For other glucocorticoid dose conversions try this online glucocorticoid dose calculator



[Q: 2532] OnExamination 2012 - Endocrinology

A 55-year-old male with type 2 diabetes is seen at annual review.

His glycaemic control is sub-optimal on diet alone and his most recent HbA1c is 7.9% (3.8-6.4). You elect to treat him with metformin 500 mg BD.

Which of the following would be the most appropriate interval to re-check his HbA1c?

- 1- Two weeks
- 2- One month
- 3- Two - three months
- 4- Four - six months
- 5- Six - twelve months

Answer & Comments

Answer: 3- Two - three months

The HbA1c is a reflection of the glycosylation of the haemoglobin moiety by glucose.

There is a strong correlation between the glycosylation of this molecule and average plasma glucose concentrations, hence its

widespread use in clinical practice as a tool to assess glycaemic control.

Furthermore, studies reveal its prognostic significance in both microvascular and macrovascular risk.

The life span of the red cell is 120 days. HbA1c reflects average blood glucose levels during the half-life of the red cell (about 60 days) and so the recommended appropriate interval for re-measuring HbA1c following change in therapy is two months.



[Q: 2533] OnExamination 2012 - Endocrinology

Side effects of recombinant human growth hormone (rhGH) therapy include which of the following?

- 1- Aplastic anaemia
- 2- Benign intracranial hypertension (BIH)
- 3- Creutzfeldt-Jakob disease (CJD)
- 4- Leukaemia
- 5- Proliferative retinopathy

Answer & Comments

Answer: 2- Benign intracranial hypertension (BIH)

Unlike the old pituitary-derived growth hormone (GH), rhGH is not associated with CJD as it is manufactured by recombinant techniques.

rhGH therapy has been associated with BIH probably due to the fluid retention associated with GH therapy.



[Q: 2534] OnExamination 2012 -
Haematology

What is the most effective bisphosphonate for use in reducing bone pain and preventing pathological fractures in patients with metastatic breast cancer?

- 1- Alendronic acid
- 2- Ibandronic acid
- 3- Olpadronate
- 4- Pamidronate
- 5- Zoledronic acid

Answer & Comments

Answer: 5- Zoledronic acid

Multiple randomised control studies have proven the efficacy of Zometa in treatment of bone metastasis from breast cancer.

It is commonly given for six months and if the patient responds then they can be switched to daily ibandronic acid to prevent repeat visits to hospital.

Zometa has a risk of osteonecrosis of the jaw which must be explained to patients before they are treated.



[Q: 2535] OnExamination 2012 -
Haematology

A 70-year-old female presents with a three month history of exertional dyspnoea and chest pain. She admitted to a poor diet, some vague abdominal pains and having lost 7 kg in weight.

Examination revealed pallor, patches of vitiligo on her arms and trunk, ankle oedema and a palpable spleen.

Investigations revealed:

Haemoglobin 5 g/dL(11.5-16.5)

MCV 105 fL(80-96)

White cell count $2 \times 10^9/L$ (4-11)

Platelet count $50 \times 10^9/L$ (150-400)

Bilirubin 40 $\mu\text{mol/L}$ (1-22)

ALT 60 U/L(1-31)

AST 40 U/L(5-35)

LDH 1000 U/L(10-250)

Which one of the following is the most likely diagnosis?

- 1- Aplastic anaemia
- 2- Autoimmune haemolytic anaemia
- 3- Dietary folate deficiency
- 4- Pernicious anaemia
- 5- Sideroblastic anaemia

Answer & Comments

Answer: 4- Pernicious anaemia

There is pancytopenia with anaemia being more significant. The anaemia is macrocytic.

Lactate dehydrogenase (LDH) is very high with some derangement of liver function tests (LFTs). Aplastic anaemia would cause pancytopenia but not a raised LDH.

Autoimmune haemolysis and sideroblastic anaemia would not cause pancytopenia.

Folate deficiency and pernicious anaemia would both cause the above results - the LDH is elevated due to ineffective erythropoiesis and likewise the deranged LFTs.

Pernicious anaemia is more likely given the history of other autoimmune disease.

Of note, with such a low haemoglobin one would expect a much higher mean corpuscular volume

(MCV); but sometimes when the deficiency is severe, the red cell anisopoikilocytosis causes a lower MCV.



[Q: 2536] OnExamination 2012 -
Haematology

A 72-year-old man presents with a five day history of cough, dyspnoea and fever.

His chest x ray shows a left basal consolidation.

His full blood count shows:

Haemoglobin 11 g/dL (13.0-18.0)

White cell count $30 \times 10^9/L$ (4-11 $\times 10^9$)

Neutrophils $10 \times 10^9/L$ (1.5-7 $\times 10^9$)

Lymphocytes $20 \times 10^9/L$ (1.5-4 $\times 10^9$)

Monocytes $1 \times 10^9/L$ (0-0.8 $\times 10^9$)

Eosinophils $0.4 \times 10^9/L$ (0.04-0.4 $\times 10^9$)

Basophils $0.1 \times 10^9/L$ (0-0.1 $\times 10^9$)

Which one of the following is the most appropriate test to establish the diagnosis?

- 1- Bone marrow aspirate
- 2- Bone marrow cytogenetics
- 3- CT abdomen
- 4- Immunophenotyping of white cells
- 5- Sputum cytology and AFB

Answer & Comments

Answer: 4- Immunophenotyping of white cells

Apart from the mild neutrophilia which could be explained by the infection the significant abnormality on the FBC is the lymphocyte count. Such a high lymphocyte count could be suggestive of a lymphoproliferative disorder such as chronic lymphocytic leukaemia. The best way to diagnose these is immunophenotyping of the blood - non-invasive and will give a diagnosis.

The patient may have lymphadenopathy or splenomegaly which would show on CT but no diagnosis can be made from this.

A bone marrow is invasive and the BM is sometimes not involved in low grade lymphoproliferative disorders and similarly there may be no cytogenetic abnormality.

The FBC is not suggestive of TB or malignancy, therefore sputum examination would not be useful.



[Q: 2537] OnExamination 2012 - Haematology

A 67-year-old man presents with a five week history of pain and swelling affecting left knee, both ankles and his right wrist.

He has had three episodes of right basal pneumonia in the last year and has lost 6 kg in weight.

His investigations are as follows:

WCC $12.1 \times 10^9/L$ (4-11)

Hb 9.8 g/dL (13.0-18.0)

MCV 79fL (80-96)

Platelets $543 \times 10^9/L$ (150-400)

ESR 43 mm in the first hour (0-20mm/1st hour)

CRP 21 mg/L (<10)

CPK 110U

RF 1/80

ANA Negative

ENA Negative

Radiographs of hands and feet Normal

What is the most likely diagnosis?

- 1- Mixed connective tissue disease
- 2- Paraneoplastic syndrome
- 3- Polyarteritis nodosa
- 4- Polymyalgia rheumatica
- 5- Rheumatoid arthritis

Answer & Comments

Answer: 2- Paraneoplastic syndrome

The suggestion here is lung malignancy with an associated paraneoplastic syndrome.

Paraneoplastic syndrome can present with an asymmetrical arthralgia which more commonly affects the lower limbs.

False positive rheumatoid factors can occur but should be of low titre.

The age of onset is usually lower than that for rheumatoid arthritis or polymyalgia rheumatica.



[Q: 2538] OnExamination 2012 - Haematology

A 22-year-old male student is admitted with weakness and tiredness. He has otherwise been well.

Examination reveals a petechial rash on the lower legs and conjunctival pallor. He takes no medication and denies any illicit drug use.

Investigations reveal:

Haemoglobin 4 g/dL (13.0-18.0)

White cell count $1 \times 10^9/L$ (4-11)

Platelets $20 \times 10^9/L$ (150-400)

Clotting profile Normal

U+Es & liver function tests Normal

Which of the following is the likely diagnosis?

- 1- Acute lymphocytic leukaemia
- 2- Acute myeloid leukaemia
- 3- Aplastic anaemia
- 4- Henoch-Schönlein purpura
- 5- Hodgkin's lymphoma

Answer & Comments

Answer: 3- Aplastic anaemia

This patient appears to have complete suppression of all his marrow components suggesting aplastic anaemia.

The acquired condition may be associated with:

Drug therapy such as cytotoxics

Chloramphenicol

Infections such as viral hepatitis

Ionising radiation and

Chemicals.



[Q: 2539] OnExamination 2012 - Haematology

A 55-year-old male presents with anorexia and weight loss of 12 months duration. Over this year he has had two deep vein thromboses (DVTs) and had the last whilst his INR was 2 (less than 1.4).

He remains on long term warfarin therapy with an INR above 2.6. Examination reveals that he is pigmented and has a postural drop in his blood pressure of 15 mmHg.

Investigations are as follows:

Sodium 131 mmol/l (137-144)

Potassium 5.0 mmol/l (3.5-4.9)

INR 3.0 (<1.4)

A short Synacthen test reveals a baseline cortisol concentration at time 0 of 120 nmol/l which rises to 155 nmol/l after 30 minutes (normal response greater than 550 nmol/l).

Which single diagnosis would explain this patient's illness?

- 1- Addison's disease
- 2- Antiphospholipid syndrome
- 3- Autoimmune polyendocrine syndrome (Schmidt's disease)
- 4- Pituitary infarction
- 5- Protein S deficiency

Answer & Comments

Answer: 2- Antiphospholipid syndrome

With a history of recurrent DVT and confirmed hypoadrenalism, this patient is likely to have the antiphospholipid syndrome. Antiphospholipid syndrome is a primary diagnosis or may co-exist with systemic lupus erythematosus.

Anticardiolipin antibodies or lupus anticoagulant may be present.

It is associated with arterial and venous thrombosis and has a predilection for the

adrenal veins causing adrenal infarction with consequent hypoadrenalism.

Addison's disease is an autoimmune phenomenon and is not associated with DVT.

The pigmentation (due to increased adrenocorticotrophic hormone [ACTH] in hypoadrenalism) would exclude pituitary infarction as the cause of the hypoadrenalism.

Hypoadrenalism is not associated with protein S deficiency.

Autoimmune polyendocrine syndrome is associated with

Hypothyroidism

Type 1 diabetes

Addison's disease.



[Q: 2540] OnExamination 2012 - Haematology

Which of the following statements relates to acquired sideroblastic anaemia?

- 1- Haemosiderinuria is a feature
- 2- Has increased methaemoglobinaemia
- 3- It is characterised by the presence of ringed sideroblasts in the peripheral blood
- 4- It shows increased haptoglobin
- 5- There may be some response to pyridoxine therapy

Answer & Comments

Answer: 5- There may be some response to pyridoxine therapy

Sideroblasts are found in marrow.

Haptoglobin falls during haemolysis and may climb with 'acute phase' response.

There is an occasional response to pyridoxine.

Methaemoglobinaemia and haemosiderinuria are features of intravascular haemolysis.



[Q: 2541] OnExamination 2012 - Haematology

Which of the following is a proto-oncogene?

- 1- The BCRab1 translocation (Philadelphia chromosome)
- 2- The N-Myc gene
- 3- The retinoblastoma gene
- 4- The WT1 (first Wilm's tumour) gene
- 5- The WT2 (second Wilm's tumour) gene

Answer & Comments

Answer: 2- The N-Myc gene

Oncogenes are endogenous human deoxyribonucleic acid (DNA) sequences that arise from normal genes called proto-oncogenes.

Proto-oncogenes are normally expressed in many cells, particularly during fetal development, and are thought to play an important regulatory role in cell growth and development.

Alterations in the proto-oncogene can activate an oncogene, which produces unregulated gene activity, contributing directly to tumourogenesis.

Oncogene alterations are important causes of: Rhabdomyosarcomas (ras oncogene)

Burkitt's lymphoma (C-myc is translocated intact from its normal position on chromosome 8 to chromosome 14)

Neuroblastoma (N-myc proto-oncogene is seen in a proportion of patients with poor prognosis).

They should be contrasted with tumour suppressor genes. In this situation, the genes normally down regulate cell growth, and require inactivation to allow malignant growth. Examples include retinoblastoma.



[Q: 2542] OnExamination 2012 -
Haematology

Which of the following regarding salivary gland pleomorphic adenomas is correct?

- 1- They are the most common salivary gland tumour
- 2- Are commoner in the sub-mandibular than the parotid gland
- 3- In the parotid gland most commonly arise medial to the facial nerve
- 4- Are more common in males than in females
- 5- Typically enhance following intravenous contrast injection in CT

Answer & Comments

Answer: 1- They are the most common salivary gland tumour

A. They are the most common salivary gland tumour representing 70% to 80% of all benign salivary gland tumours.

B. Eighty four per cent occur in the parotid gland.

C. Ninety per cent of parotid gland pleomorphic adenomas arise lateral to the facial nerve.

D. They occur most often in women over 40.

E. Usually they do not enhance.



[Q: 2543] OnExamination 2012 -
Haematology

Which of the following concerning diamorphine elixir for the relief of pain in terminal patients is correct?

- 1- Analgesia is enhanced if cocaine is added
- 2- Constipation is a characteristic sequel to treatment
- 3- Dependence occurs rapidly
- 4- Initial sedation typically continues whilst the drug is administered

- 5- The same amount of pain relief is produced as when the same dose is given via intramuscular injection

Answer & Comments

Answer: 2- Constipation is a characteristic sequel to treatment

Sedation occurring in the first few days typically wears off, leaving the patient alert.

Hallucinations also tend to occur.

An aperient should always be added to the treatment regime.

Addiction is not a problem.

An intramuscular injection is three times more effective than the same oral dose.

(Cornwall Trainers)



[Q: 2544] OnExamination 2012 -
Haematology

Which of the following is associated with a GH secreting pituitary tumour?

- 1- Gs alpha subunit mutation
- 2- H-ras mutation
- 3- p53 mutation
- 4- Pit-1 mutation
- 5- Rb 1 mutation

Answer & Comments

Answer: 1- Gs alpha subunit mutation

A stimulatory mutation of the Gs protein alpha subunit has been noted in approximately 30% of growth hormone (GH) secreting pituitary tumours.



[Q: 2545] OnExamination 2012 -
Haematology

An 82-year old man presents to his general practitioner with a six month history of fatigue and increasing exertional dyspnoea.

Investigations show:

Haemoglobin 7.5 g/dL (13.0-18.0)

MCV 112 fL (80-96)

White blood cells $3.12 \times 10^9/L$ (4-11 $\times 10^9$)

Neutrophils 34%

Blasts 1%

Platelets $12 \times 10^9/L$ (150-400 $\times 10^9$)

A bone marrow aspirate stained with Perls' stain showed ring sideroblasts.

What is the most likely diagnosis?

- 1- Aplastic anaemia
- 2- Chronic myeloid leukaemia
- 3- Metastatic bone marrow infiltration
- 4- Myelodysplastic syndrome
- 5- Myelofibrosis

Answer & Comments

Answer: 4- Myelodysplastic syndrome

The patient has a macrocytic anaemia, thrombocytopenia and neutropenia with a small number of circulating blasts. This suggests a diagnosis of myelodysplastic syndrome, and this is supported by the finding of ring sideroblasts in the marrow.

Ring sideroblasts contain an abnormally high concentration of iron - usually stored in perinuclear mitochondria.

Perls' stain (which stains for iron) shows this iron deposition as a dark ring around the margin of the nucleus.



[Q: 2546] OnExamination 2012 - Haematology

At which point in the cell cycle is the cell most sensitive to radiation-induced apoptosis?

- 1- G0
- 2- G1
- 3- G2-M

4- S

5- S-G2

Answer & Comments

Answer: 3- G2-M

Normal and cancerous cells exhibit different radiosensitivities during different phases of the cell cycle.

They are most sensitive in G2-M phase when the cell is preparing to and actively dividing due to the fragile nature of the intracellular structure during this event.



[Q: 2547] OnExamination 2012 - Haematology

A 61-year-old man presents with haematuria. He is on warfarin for chronic atrial fibrillation.

His FBC shows a Hb of 112 g/L and his INR is 9 - the patient is haemodynamically stable.

The consultant on take advises that this patient needs reversal of the warfarin.

Of the following, which would be the blood product/s of choice?

- 1- Cryoprecipitate
- 2- Fresh frozen plasma/prothrombin concentrate
- 3- Packed cells
- 4- Platelets
- 5- Recombinant factor VII.

Answer & Comments

Answer: 2- Fresh frozen plasma/prothrombin concentrate

Fresh frozen plasma/prothrombin concentrates are products of choice for warfarin reversal (option B).

While packed cells are important to treat significant bleeding it would not be indicated at this stage (option D).

Cryoprecipitate, recombinant factor VII and platelets are not indicated for warfarin reversal (options A, D and E).



[Q: 2548] OnExamination 2012 - Haematology

A 46-year-old woman presents with a rapidly increasing mass on the left side of her neck over her thyroid gland. She has noticed some problems with dysphagia over the past few months, but no other symptoms of note apart from perhaps a slow increase in her weight and some tiredness.

On examination her BP is 122/72 mmHg. Her pulse is 72 and regular. Her BMI is 31. Respiratory and abdominal examination is unremarkable. Palpation of the left side of her neck reveals thyroid enlargement with associated lymphadenopathy.

Investigations show:

Haemoglobin 11.5 g/dl(11.5-16.5)

White cells $8.3 \times 10^9/L$ (4-11)

Platelets $185 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 4.4 mmol/l (3.5-5)

Creatinine 96 $\mu\text{mol/l}$ (79-118)

Thyroid stimulating hormone 7.6 mu/l (0.5-5.0)

Lactate dehydrogenase 640 U/l (240-280)

Erythrocyte sedimentation rate 82 mm/hr(<20)

Which of the following is the most likely diagnosis?

- 1- Follicular thyroid carcinoma
- 2- Graves' disease
- 3- Hashimoto's disease
- 4- Hodgkin's lymphoma
- 5- Thyroid lymphoma

Answer & Comments

Answer: 5- Thyroid lymphoma

This rare lymphoma is frequently associated with Hashimoto's thyroiditis. Hypothyroidism is observed in 30-40% and that suspicion is raised by the gradual weight gain and raised TSH seen here.

Her raised ESR, haemoglobin at the lower end of the normal range, and her raised LDH all raise the possibility of lymphoma. Hoarseness, respiratory difficulty and cough can also occur as presenting symptoms.

Biopsy is the investigation of choice, but the sample obtained from fine needle aspiration (FNA) alone may not be sufficient to come to a conclusion on architecture.

The commonest types of thyroid lymphoma are

Large cell

Follicular

MALT.



[Q: 2549] OnExamination 2012 - Haematology

A 72-year-old man presents to the haematology clinic. He has suffered increasing headaches over the past few weeks, and unfortunately suffered a myocardial infarction some four weeks ago. He has been buying anti-histamines over the counter because of increasing itching.

During his admission it was noted that he had a marked elevation in haemoglobin, white cells and platelets. He is a non-smoker with no history of chest disease.

On examination in the clinic today he is hypertensive with a BP of 155/90 mmHg. Heart sounds are normal and his chest is clear. He looks plethoric with a ruddy complexion, and you notice that he has splenomegaly on abdominal examination.

Investigations show

Haemoglobin 19.8 g/dl(13.5-18)

White cell count $18.7 \times 10^9/L$ (4-10)

Platelets $672 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (134-143)

Potassium 4.7 mmol/l (3.5-5)

Creatinine 140 $\mu\text{mol/l}$ (60-120)

Which of the following is the most likely mutation that he carries?

- 1- Bcr-abl
- 2- HER-1
- 3- HER-2
- 4- JAK 1
- 5- JAK 2

Answer & Comments

Answer: 5- JAK 2

JAK2 V617F is detectable in 95% of patients with primary polycythaemia. It is a cytoplasmic tyrosine kinase which is responsible for signal transduction of haemopoietic growth factors, including erythropoietin.

JAK2 mutation is a primary event in the development of primary polycythaemia, with homozygosity for the mutation conferring a proliferative advantage for the cells concerned.

Currently a new range of agents targeted against JAK2 are under development for the treatment of myeloproliferative disorders.



[Q: 2550] OnExamination 2012 - Haematology

A firm 2-3 cm mass is palpable in the upper outer quadrant of the right breast of a 52-year-old woman. There are no palpable axillary lymph nodes.

A lumpectomy with axillary node dissection is performed and the breast lesion is found to have positive immunohistochemical staining for HER2/neu (c-erb B2).

Staining for oestrogen and progesterone receptors is negative.

Which of the following additional treatment options is most appropriate, based upon these findings?

- 1- Radical mastectomy
- 2- St John's wort
- 3- Tamoxifen
- 4- Trastuzumab
- 5- Vancomycin

Answer & Comments

Answer: 4- Trastuzumab

This is an infiltrating ductal carcinoma.

The lack of oestrogen receptor staining suggests a poor response to hormonal therapy with tamoxifen.

The positive C-erb B2 (HER2/neu) staining suggests that trastuzumab (Herceptin) may be effective.



[Q: 2551] OnExamination 2012 - Haematology

A 30-year-old woman has a right mastectomy and axillary lymph node dissection for a carcinoma diagnosed by fine needle aspiration cytology.

The histological pattern is that of a poorly differentiated carcinoma that is negative for oestrogen and progesterone receptors, but is positive for HER2/neu. One axillary lymph node demonstrates micro-metastases. Her 32-year-old sister is found to have a similar lesion.

Which of the following statements regarding risk factors for this lesion is the most appropriate?

- 1- A history of late menarche is likely to be present in females in this family
- 2- Fibrocystic changes were present for many years

- 3- She had a history of exposure to hydrocarbon compounds
- 4- She has a positive antinuclear antibody test
- 5- These findings suggest a BRCA-1 mutation

Answer & Comments

Answer: 5- These findings suggest a BRCA-1 mutation

A small number of breast cancers are the result of an inherited BRCA-1 mutation (or BRCA-2), but the family history of breast cancer at a young age makes this more likely.

Early menarche and late menopause and nulliparity are risks for breast cancer.

Autoimmune diseases do not appreciably increase the risk for breast cancer.



[Q: 2552] OnExamination 2012 - Haematology

A 60-year-old lady with bruising is investigated and found to have the following full blood count:

Haemoglobin 13 x10 g/dL(11.5-16.5)

White cell count 6.3 x 10⁹/L (4-11 x10⁹)

Platelet count 15 x 10⁹/L (150-400 x10⁹)

She refuses to give consent to a bone marrow biopsy.

What is the most appropriate management plan?

- 1- Intravenous immunoglobulin
- 2- No treatment
- 3- Oral prednisolone
- 4- Platelet transfusion
- 5- Splenectomy

Answer & Comments

Answer: 3- Oral prednisolone

This lady most likely has idiopathic thrombocytopenic purpura.

The history should highlight any drug causes (not mentioned here) and a blood film would help exclude leukaemia.

A bone marrow examination is useful especially in the older person.

Platelet transfusion would not be helpful without treating the underlying cause.

No treatment is often an option but this lady is older and has bruising.

Given the circumstances the best management plan is to treat with steroid.



[Q: 2553] OnExamination 2012 - Haematology

A 61-year-old who has smoked for 40 years presents with thoracic back pain.

His investigations reveal:

Haemoglobin 11.1 g/dL (13.0-18.0)

Urea 9.3 mmol/L (2.5-7.5)

Creatinine 298 µmol/L (60-110)

Calcium 3.67 mmol/L (2.2-2.6)

Albumin 30 g/L (37-49)

Total protein 97 g/L (61-76)

Thoracic spine x ray Collapse of T8

Which investigation would confirm the diagnosis?

- 1- Bone marrow aspirate
- 2- Creatinine clearance
- 3- CXR
- 4- ESR
- 5- PTH

Answer & Comments

Answer: 1- Bone marrow aspirate

This man has myeloma. The smoking is a red herring.

Myeloma typically presents with back pain often associated with pathological fractures.

He is mildly anaemic, there is renal impairment and hypercalcaemia, with a raised total protein secondary to a paraproteinaemia.

Bone marrow examination would reveal increased plasma cells (greater than 4% and usually greater than 30%). The erythrocyte sedimentation rate will be raised, but the bone marrow aspirate would confirm the diagnosis irrefutably.



[Q: 2554] OnExamination 2012 - Haematology

A 69-year-old male presents with tiredness and dyspnoea and is diagnosed with acute myeloid leukaemia.

Which of the following is the most important prognostic factor?

- 1- Elevated lactate dehydrogenase activity
- 2- Karyotype of bone marrow
- 3- Monocytic morphology
- 4- Number of blasts in bone marrow
- 5- White cell count at diagnosis

Answer & Comments

Answer: 2- Karyotype of bone marrow

A, C, and D have no prognostic value.

White cell count at diagnosis is however important, but most important is the karyotype of bone marrow, as this result stratifies patients into lower risk, standard risk and poor risk, which has prognostic significance.



[Q: 2555] OnExamination 2012 - Haematology

A 16-year-old girl with sickle cell disease presented with malaise and rapidly increasing dyspnoea.

A full blood count showed:

Hb 5.1 g/dL (11.5-16.5)

Reticulocyte count $5.5 \times 10^9/L$ (25-85 $\times 10^9$)

What is the most likely cause?

- 1- Epstein-Barr virus
- 2- Hepatitis E virus
- 3- Human immunodeficiency virus
- 4- Human papillomavirus-16 (HPV 16)
- 5- Parvovirus B19

Answer & Comments

Answer: 5- Parvovirus B19

Aplastic crisis in sickle-cell anaemia (SSA) is caused by infection with the parvovirus B19.

The virus infects red cell progenitors in bone marrow, resulting in cessation of erythropoiesis and a very rapid drop in haemoglobin.

The condition is self-limited, with bone marrow recovery occurring in 7-10 days, followed by brisk reticulocytosis.



[Q: 2556] OnExamination 2012 - Haematology

A 28-year-old pregnant woman is being treated for a deep vein thrombosis with unfractionated heparin.

A recent blood test shows:

Haemoglobin 9.8 g/dL (11.5-16.5)

White cell count $9.5 \times 10^9/L$ (4-11)

Platelets $35 \times 10^9/L$ (150-400)

What would be the best course of action for this woman?

- 1- Change to hirudin
- 2- Change to low molecular weight heparin
- 3- Change to warfarin
- 4- Danaparoid
- 5- No change in treatment and observe

Answer & Comments

Answer: 4- Danaparoid

This patient appears to have heparin-induced thrombocytopenia (HIT). When HIT is suspected, heparin treatment should be discontinued and alternative anticoagulation should be started.

The heparinoid danaparoid appears to be the drug of choice for acute treatment and prophylaxis because of its low placental permeability.

Hirudin should only be used when either cross-reactivity with heparin-induced antibodies or cutaneous allergy against heparinoids are observed.



[Q: 2557] OnExamination 2012 - Haematology

In the consideration of disseminated intravascular coagulation (DIC), which of the following statements is most correct?

- 1- In DIC associated with sepsis secondary to retained products of conception, treatment of antibiotics will alleviate the process
- 2- Organ failure is a common finding in DIC
- 3- The intrinsic pathway is not involved in the pathophysiology of DIC
- 4- The presence of DIC does not increase mortality from the underlying disease
- 5- There are no randomised control trials to guide treatment in DIC

Answer & Comments

Answer: 2- Organ failure is a common finding in DIC

DIC is caused by the enhanced and abnormally sustained generation of thrombin.

Organ failure is a common finding, being as common as bleeding in DIC, and is likely to be due to fibrin deposition within the organ.

The presence of DIC significantly increases mortality rates in affected patients, and treatment of the underlying cause of the DIC, for example, sepsis, does not always lead to resolution of the condition.

Recombinant human activated protein C has been shown to be effective in reducing mortality from DIC in patients with sepsis. Several clinical trials have been published to guide treatment in DIC, one of which confirms the improved mortality with recombinant human activated protein C.

Secondary bursts of thrombin formation seen in DIC are instigated by the intrinsic pathway.

For a well informed review see BMJ 2003;327:974-7.



[Q: 2558] OnExamination 2012 - Haematology

A 68-year-old female with terminal bowel cancer is receiving optimal doses of morphine sulphate therapy.

Which of the following effects may be expected with the addition of a partial opioid agonist?

- 1- Increased analgesia
- 2- Increased respiratory depression
- 3- Increased sedation
- 4- No change
- 5- Reduced analgesia

Answer & Comments

Answer: 5- Reduced analgesia

Partial opioid agonists (for example, buprenorphine), when used in association with morphine, may produce a reduction in the analgesic effect due to partial antagonism.

This is an aspect of pain management that needs to be considered when using combination therapies.



[Q: 2559] OnExamination 2012 -
Haematology

A study of a new chemotherapy drug for lung cancer is reported in a medical journal. The authors state that with the new agent the five year mortality rate was 60%. Without treatment the five year mortality rate was 80%.

Which of the following represents the absolute risk reduction using this treatment?

- 1- 10%
- 2- 20%
- 3- 25%
- 4- 33%
- 5- 40%

Answer & Comments

Answer: 2- 20%

The absolute risk reduction is an important figure and should always be quoted instead of the the relative risk reduction.

Examples: If a drug reduces the incidence of heart attacks from 10% to 5% then:

The control event rate (CER) is 10%

The experimental event rate (EER) is 5%

The relative risk reduction (RRR) is 50%

The absolute risk reduction (ARR) is 5%

The number needed to treat (NNT) is $100\% / 5\% = 20$.



[Q: 2560] OnExamination 2012 -
Haematology

A 45-year-old woman noticed tinnitus in her left ear which progressed over some weeks to hearing loss in that ear.

On physical examination she is found to have a marked decrease in hearing on the left, with Rinne test indicating air conduction better

than bone conduction. The other cranial nerves I - VII and IX - XII are intact.

A brain MRI scan revealed a solitary, fairly discrete 3 cm mass located in the region of the left cerebellopontine angle.

Which of the following statements is most appropriate to tell the patient regarding these findings?

- 1- A test for HIV-1 is likely to be positive
- 2- Other family members should undergo MR imaging of the brain
- 3- Remissions and exacerbations are likely to occur in coming years
- 4- The lesion can be resected with a good prognosis
- 5- You are unlikely to survive for more than a year

Answer & Comments

Answer: 4- The lesion can be resected with a good prognosis

These acoustic neuromas are benign neoplasms.

A solitary mass is unlikely to be part of neurofibromatosis (which could be familial).



[Q: 2561] OnExamination 2012 -
Haematology

Which of the following conditions is most likely to be associated with thrombocytopenia?

- 1- Haemophilia A
- 2- Hereditary haemorrhagic telangiectasia
- 3- Pernicious anaemia
- 4- Porphyria
- 5- Uraemia

Answer & Comments

Answer: 3- Pernicious anaemia

Pernicious anaemia is usually a megaloblastic anaemia but may also be associated with a pancytopenia.

The platelet count is usually normal in chronic renal failure but there is a platelet function abnormality.



[Q: 2562] OnExamination 2012 - Haematology

A 68-year-old man complained of tiredness and lethargy.

On examination there was 2 cm hepatomegaly and 7 cm splenomegaly.

Investigations show:

Haemoglobin 17.4 g/dL (13.0-18.0)

White cell count $39.4 \times 10^9/L$ (4-11 $\times 10^9$)

White cell differential:

Neutrophils $22.2 \times 10^9/L$ (1.5-7 $\times 10^9$)

Lymphocytes $1.1 \times 10^9/L$ (1.5-4 $\times 10^9$)

Monocytes $1.0 \times 10^9/L$ (0-0.8 $\times 10^9$)

Eosinophils $0.4 \times 10^9/L$ (0.04-0.4 $\times 10^9$)

Basophils $2.1 \times 10^9/L$ (0-0.1 $\times 10^9$)

Metamyelocytes $1.2 \times 10^9/L$

Myelocytes $10.9 \times 10^9/L$

Myeloblasts $1.3 \times 10^9/L$

Nucleated RBC3 per 100 rbc

Platelet count $585 \times 10^9/L$ (150-400 $\times 10^9$)

What is the most likely diagnosis?

- 1- Acute myeloid leukaemia
- 2- Chronic myeloid leukaemia (CML)
- 3- Essential thrombocythaemia
- 4- Myelofibrosis
- 5- Primary proliferative polycythaemia (rubra vera)

Answer & Comments

Answer: 2- Chronic myeloid leukaemia (CML)

The presentation is typical with vague symptoms of malaise and splenomegaly.

The blood film also shows the typical high white cell count and there are all stages of myeloid cell maturation present in the peripheral blood with the metamyelocytes suggesting CML.

Thrombocythaemia is also seen in CML.



[Q: 2563] OnExamination 2012 - Haematology

Which of the following does not have a role in the management of chronic cancer pain?

- 1- Carbamazepine
- 2- Clodronate
- 3- Dexamethasone
- 4- Nifedipine
- 5- Pinavarium

Answer & Comments

Answer: 5- Pinavarium

Pinavarium is used to reduce the pain duration in irritable bowel syndrome (IBS).

Carbamazepine is in use for the treatment of neuropathic pain of malignancy, diabetes and other disorders.

Clodronate inhibits osteoclastic bone resorption and is used to treat malignant bone pain and the associated hypercalcaemia.

The corticosteroids are used to treat pain from central nervous system tumours.

Reducing the inflammation and oedema relieves the pain caused by neural compression.

Nifedipine helps relieve painful oesophageal spasm and tenesmus associated with gastrointestinal tumours.

Painful bladder spasm may be relieved by oxybutinin.



[Q: 2564] OnExamination 2012 -
Haematology

In sickle cell disease, which of the following is correct?

- 1- Exchange transfusions prior to major surgery on HbSS patients aims to lower the HbS concentration to 60%
- 2- It is caused by the substitution of glutamic acid by valine at position 4 on the beta chain of haemoglobin
- 3- The erythrocytes of haemoglobin AS patients can sickle at a pO_2 of 5 - 6 kPa (40 - 50 mmHg)
- 4- The erythrocytes of haemoglobin SC patients may sickle at a pO_2 of 4 kPa (30 mmHg)
- 5- The Sickledex test involves adding a reagent to blood which allows the nature of the haemoglobinopathy to be determined

Answer & Comments

Answer: 4- The erythrocytes of haemoglobin SC patients may sickle at a pO_2 of 4 kPa (30 mmHg)

Sickle cell disease in a haemoglobinopathy is caused by the substitution of glutamic acid by valine at position 6 (from the N-terminal) of the beta chain.

It is inherited as an autosomal gene, heterozygous (HbAS) and homozygous (HbSS) forms exist.

A low partial pressure of oxygen (PO_2) causes HbS to polymerise and precipitate resulting in sickling of the erythrocyte. HbSS patients sickle at PO_2 of 5 - 6 kPa and HbAS patients sickle at PO_2 of 2.5 - 4 kPa.

A mild disease is produced when heterozygotes for HbS combine with other haemoglobins, for example, haemoglobin C, thus creating HbSC. Sickling occurs at around 4 kPa.

Diagnosis of sickle cell disease requires the detection of HbS.

The Sickledex test involves the addition of reagent to blood; turbidity confirming the presence of HbS, but it gives no information on other haemoglobins.

Haemoglobin electrophoresis is the only investigation that determines the nature of the haemoglobinopathy.



[Q: 2565] OnExamination 2012 -
Haematology

A previously fit 30-year-old male presents with a two month history of weight loss, tiredness and nausea.

Investigations show:

Haemoglobin 10.5 g/dL (13.0-18.0)

MCV 88 fL (80-96)

White cell count $6.0 \times 10^9/L$ (4-11 $\times 10^9$)

Platelets $450 \times 10^9/L$ (150-400 $\times 10^9$)

Serum Sodium 130 mmol/L (137-144)

Serum Potassium 5.7 mmol/L (3.5-4.9)

Serum Urea 3.0 mmol/L (2.5-7.5)

Serum creatinine 78 $\mu\text{mol/L}$ (60-110)

Serum total T_4 55 nmol/L (50-150)

Serum TSH 8 mU/L (0.4-5)

Which of the following is the most useful diagnostic investigation?

- 1- Anti-thyroid peroxidase antibody titre
- 2- Free thyroxine concentration
- 3- Insulin tolerance test
- 4- Short Synacthen test
- 5- TRH test

Answer & Comments

Answer: 4- Short Synacthen test

This patient presents with weight loss, tiredness and nausea. He has hyponatraemia,

hyperkalaemia and what appears to be a mild primary hypothyroidism.

The diagnosis is likely to be Addison's (primary hypoadrenalism) disease and the most appropriate test would be a short Synacthen test.

The link between Addison's and primary hypothyroidism is that they are both conditions in the complex of autoimmune polyendocrine syndrome. Other possible associations of this cluster would be

Type 1 diabetes

Vitiligo

Pernicious anaemia and

Chronic active hepatitis.

An insulin tolerance test is contraindicated in patients in whom cortisol is less than 100 nmol/L.

A thyrotropin-releasing hormone (TRH) test is rarely performed these days and really is an irrelevance.



[Q: 2566] OnExamination 2012 - Haematology

In which of the following do mutations of the p53 gene frequently occur?

- 1- Bronchial carcinoma
- 2- Colonic polyps
- 3- Cystic fibrosis
- 4- Huntington's disease
- 5- Type 2 diabetes mellitus

Answer & Comments

Answer: 1- Bronchial carcinoma

p53 is a tumour suppressor gene and inactivating mutations of this gene occur in a large proportion of human cancers.



[Q: 2567] OnExamination 2012 - Haematology

Which RBC antigen is involved in the entry of P. vivax into red blood cells?

- 1- Anti-D
- 2- Anti-S
- 3- Duffy
- 4- Kell
- 5- Kidd

Answer & Comments

Answer: 3- Duffy

The Duffy antigen receptor facilitates the entry of P. vivax into the red blood cells and Duffy negative individuals are therefore resistant to this strain.

A similar situation exists with P. ovale but Duffy negative offers slightly less protection.



[Q: 2568] OnExamination 2012 - Haematology

You are evaluating a new agent which is thought to improve the recognition of foreign antigen by antigen presenting cells (APCs).

Which of the following correctly represents one aspect of the physiology of APCs?

- 1- Antigen is presented via MHC class I complexes
- 2- Antigen presented on APCs is recognised by CD4 positive cells
- 3- APCs are required before a response to viruses can be generated
- 4- Direct antigenic stimulation still requires APCs
- 5- Follicular dendritic cells express MHC class 2

Answer & Comments

Answer: 2- Antigen presented on APCs is recognised by CD4 positive cells

Extracellular antigen which is not directly recognised as foreign requires processing by APCs to generate an immune response. This process involves these cells expressing antigenic peptides in conjunction with MHC class II.

Antigen is presented via MHC class II complexes, MHC class I aids in the recognition of virally infected cells.

Direct stimulation of an immune response may occur in the absence of APCs.

Follicular dendritic cells are a distinct lineage which do not express MHC class II, but can still bind the Fc portion of antibodies.

APCs are not required before an immune response to viral infection can be successfully mounted.



[Q: 2569] OnExamination 2012 - Haematology

By what mechanism do the platinum based chemotherapies cause DNA damage and cell death?

- 1- Alkylating agent
- 2- Antimetabolite
- 3- DNA cross linkage
- 4- Inhibition of topoisomerase
- 5- Unknown

Answer & Comments

Answer: 3- DNA cross linkage

Cisplatin cross-links DNA in several different ways, interfering with cell division by mitosis.

The damaged DNA elicits DNA repair mechanisms, which in turn activate apoptosis when repair proves impossible.

Examples of platinum based chemotherapies are cisplatin, carboplatin and oxaliplatin.



[Q: 2570] OnExamination 2012 - Haematology

Upregulation of which of the following proteins is associated with multi-drug chemotherapy resistance?

- 1- BCL-2
- 2- CYP2D6
- 3- Cytochrome P450
- 4- p53
- 5- P-glycoprotein

Answer & Comments

Answer: 5- P-glycoprotein

P-glycoprotein is a member of the adenosine triphosphate (ATP)-binding cassette transporters which actively remove harmful substances from the cytoplasm.

If upregulated these proteins can pump chemotherapeutic agents out of tumour cells leading to drug resistance.



[Q: 2571] OnExamination 2012 - Haematology

Which virus is commonly associated with nasopharyngeal carcinoma?

- 1- Epstein-Barr virus
- 2- Hepatitis B
- 3- Human papilloma virus 16
- 4- Human papilloma virus 18
- 5- Human T-lymphotrophic virus

Answer & Comments

Answer: 1- Epstein-Barr virus

Epstein-Barr virus is detectable in over 90% of nasopharyngeal cancers of which the most common type is the undifferentiated form.



[Q: 2572] OnExamination 2012 -
Haematology

Which malignancy is most associated with the Lambert-Eaton myasthenic para-neoplastic syndrome (LEMS)?

- 1- Adenocarcinoma lung cancer
- 2- Metastatic bowel cancer
- 3- Metastatic melanoma
- 4- Small cell lung cancer
- 5- Squamous cell lung cancer

Answer & Comments

Answer: 4- Small cell lung cancer

Lambert-Eaton myasthenic syndrome is a rare paraneoplastic disorder associated with antibodies directed against voltage-gated calcium channels.

Approximately 60% of patients with LEMS will have an underlying malignancy.



[Q: 2573] OnExamination 2012 -
Haematology

A 35-year-old woman is diagnosed with a below knee deep vein thrombosis (DVT).

She is currently undergoing endocrine treatment for breast cancer.

Which agent is she likely to have been prescribed?

- 1- Anastrozole
- 2- Exemestane
- 3- Fulvestrant
- 4- Megace
- 5- Tamoxifen

Answer & Comments

Answer: 5- Tamoxifen

Of all the options, only tamoxifen is strongly associated with an increased risk of thrombosis.

Patients must be told this at the time of prescription and steps taken to minimise any other risk factors such as a sedentary lifestyle and smoking.



[Q: 2574] OnExamination 2012 -
Haematology

A 35-year-old woman develops an erythematous rash over her left nipple after breast feeding her child.

It is not painful but has not resolved with multiple courses of antibiotics. She has noted some recent nipple inversion.

What is the best investigation?

- 1- CT chest, abdomen and pelvis
- 2- Mammogram
- 3- MRI of breast
- 4- Skin biopsy
- 5- Ultrasound of breast

Answer & Comments

Answer: 4- Skin biopsy

This is Paget's disease of the breast. It presents insidiously and is similar in appearance to eczema; as such it often goes undiagnosed for several months.

Most cases are associated with invasive breast cancer, or ductal carcinoma in situ. Malignant cells infiltrate into the epidermis via the mammary duct epithelium, leading to thickening of the affected skin.

Skin biopsy with immunohistochemistry is the first line investigation. Investigations should also be done for underlying malignancy - biopsy if a lump is palpable, imaging if no lump is palpable.

Management is usually surgical with post-operative radiotherapy being offered to young patients with a high chance of recurrence.



[Q: 2575] OnExamination 2012 -
Haematology

A 75-year-old man presents with irritative and obstructive urinary symptoms of six months duration. He has noticed occasional haematuria and associated nocturia five times a night.

PR examination and subsequent prostate biopsy confirms prostate cancer.

What histological grading system is used to grade prostate cancer?

- 1- Ann Arbor
- 2- Breslow's depth
- 3- Duke's
- 4- Gleason
- 5- TNM staging

Answer & Comments

Answer: 4- Gleason

TNM staging is used for the majority of cancers but it is a staging system, not a grading system.

Ann Arbor is used to stage lymphoma.

Duke's staging is historically used for colon cancer but is less used in modern practice.

Breslow's depth is used in melanoma.

Gleason grading takes account of the most prevalent tumour pattern in the pathological system (1-5) and the second most prevalent tumour pattern (1-5).

It is presented as, for example, Gleason 3+4 = 7. This is important as a Gleason 4+3 = 7 obviously has a worse prognosis than a Gleason 3+4 = 7 even though they both have the same total score.



[Q: 2576] OnExamination 2012 -
Haematology

A 35-year-old woman presents to the

emergency medical unit with an acutely swollen, tense left calf. A subsequent ultrasound scan reveals a deep vein thrombosis (DVT).

She has been treated for the past two years with an endocrine agent to prevent recurrence of a breast cancer.

With which endocrine agent is she likely to have been treated?

- 1- Anastrozole
- 2- Exemestane
- 3- Fulvestrant
- 4- Letrozole
- 5- Tamoxifen

Answer & Comments

Answer: 5- Tamoxifen

Patients must be consented for the increased risk of DVT when taking tamoxifen.

Although this is only a small increase in risk per person, due to the large numbers of patients treated with this agent it will be linked to a significant number of DVT cases seen.

For more information including trials data please see the NICE guidance.



[Q: 2577] OnExamination 2012 -
Haematology

Which of the following investigations is not done routinely for a patient with an acute sickle cell crisis?

- 1- Full blood count
- 2- Reticulocyte count
- 3- Cultures
- 4- Cross match
- 5- Bone x ray

Answer & Comments

Answer: 5- Bone x ray

Although bone x rays can show bone infection and avascular necrosis they are not done routinely as they will not aid management in the majority of patients presenting with a sickle cell crisis.

Full blood count is vital to establish any acute worsening of the patient's anaemia. White cell count may be raised in infection.

Reticulocyte count is raised in haemolysis and splenic sequestration and decreased in aplastic crises.

Cultures are essential in patients in whom infection is suspected. Cultures will confirm the pathogens present and give sensitivities.

Cross matching the patient is important as they may require a blood transfusion.

Option A is incorrect as this investigation is done routinely for a patient presenting with an acute sickle cell crisis.

Option B is incorrect as this investigation is done routinely for a patient presenting with an acute sickle cell crisis.

Option C is incorrect as this investigation is done routinely for a patient presenting with an acute sickle cell crisis.

Option D is incorrect as this investigation is done routinely for a patient presenting with an acute sickle cell crisis.

Option E is correct as this investigation is not done routinely for a patient presenting with an acute sickle cell crisis.



[Q: 2578] OnExamination 2012 - Haematology

A patient presents with acute promyelocytic leukaemia (APL).

What is the likely mechanism underlying leukaemogenesis?

- 1- Aberrant fusion of 2 genes
- 2- Impaired protein degradation
- 3- Over expression of cellular oncogene
- 4- Post-translational modification
- 5- Telomere shortening

Answer & Comments

Answer: 1- Aberrant fusion of 2 genes

In APL one of the retinoic acid receptor genes, RARA, is fused to PML in the great majority of patients as a result of the chromosomal translocation t(15; 17).



[Q: 2579] OnExamination 2012 - Haematology

A 40-year-old gentleman presents to the Emergency department with a two week history of lethargy, low grade fever and gum bleeding. He is obtunded.

His full blood count shows a white cell count of $350 \times 10^9/L$, haemoglobin of 5.4 g/dL and a platelet count of $23 \times 10^9/L$.

Which of the following would be the most appropriate treatment option in this case?

- 1- Cytotoxic chemotherapy
- 2- Intravenous broad-spectrum antimicrobials.
- 3- Leukapheresis followed by cytotoxic chemotherapy.
- 4- Transfusion of 3 units of red cell concentrate
- 5- Transfusion of one adult therapeutic dose of single donor platelets

Answer & Comments

Answer: 3- Leukapheresis followed by cytotoxic chemotherapy.

This question covers the presentation of acute leukaemia with hyperleukocytosis.

Acute leukaemia can present with evidence of hyperleukocytosis. There is a predominance of

CNS and chest symptomatology, and management should include reduction of the white cell mass by leukapheresis until the appropriate diagnosis is reached, whence the effect of leukapheresis should be consolidated with the appropriate cytotoxic therapy.

Transfusion of red cell concentrate can worsen the hyperviscosity; thus option D is incorrect.

Whereas transfusion of platelet support and antimicrobials is also indicated, the most appropriate treatment would be leukapheresis followed by cytotoxics in the acute setting, thus eliminating answers A, B and E.



[Q: 2580] OnExamination 2012 - Haematology

Which one of the following vaccinations should not be given to patients undergoing chemotherapy?

- 1- Hepatitis A
- 2- Influenza
- 3- Pneumococcus
- 4- Rubella
- 5- Tetanus

Answer & Comments

Answer: 4- Rubella

Live vaccines should not be given whilst having chemotherapy and for six months afterwards. These include

Rubella

Mumps

Measles

MMR (the triple vaccine for measles, mumps and rubella)

BCG (for tuberculosis)

Yellow fever.

Vaccinations with non-live vaccines are safe extra space, but until the immune system is back to normal, they may not give as much protection against infection as they usually would.



[Q: 2581] OnExamination 2012 - Haematology

Which of the following infusion times would be appropriate during the transfusion of a blood product in a stable patient?

- 1- A platelet transfusion should be given over 90 minutes
- 2- A packed cell transfusion should be given over 20 minutes
- 3- A platelet transfusion should be given over 60 minutes
- 4- A packed cell transfusion should be given over 90 minutes
- 5- A platelet transfusion over 120 minutes

Answer & Comments

Answer: 4- A packed cell transfusion should be given over 90 minutes

In a stable patient red cell packs may be transfused over 90-120 minutes while a platelet transfusion should not take more than 20-30 minutes (hence option D is correct).

Rapid infusion of red cells or fresh frozen plasma may be required in an acutely bleeding patient but not in this patient who is stable (hence not A, B, C and E).



[Q: 2582] OnExamination 2012 - Haematology

A 62-year-old man presents with extreme fatigue, weight loss and night sweats. He has been feeling very unwell for the past few months and has taken early retirement from his job. He has problems eating because he feels constantly full.

On examination his BP is 142/82 mmHg, his pulse is 85 and regular, he looks pale. He has gross hepatosplenomegaly.

Investigations show:

Hb 8.9 g/dl(13.5-18)

WCC $25.0 \times 10^9/L$

Increased neutrophils, basophils and eosinophils (4-11)

PLT $171 \times 10^9/L$ (150-400)

Na 139 mmol/l (135-146)

K 4.8 mmol/l (3.5-5)

Cr $137 \mu\text{mol/l}$ (79-118)

Bone marrow Hypercellular with increased myeloid cell line precursors

He starts imatinib therapy but is unable to tolerate it due to diarrhoea, which fails to resolve with a series of interventions.

Which of the following is the most appropriate next treatment for him?

- 1- Busulphan
- 2- Dasatinib
- 3- Interferon alpha and cytarabine
- 4- Methotrexate
- 5- Nilotinib

Answer & Comments

Answer: 3- Interferon alpha and cytarabine

There has been some debate as to whether patients who are intolerant of imatinib should be trialled on another kinase inhibitor such as dasatinib or nilotinib; however the most recent available NICE guidance suggests that conventional therapy with interferon alpha and cytarabine may be more appropriate.

Cytogenetic improvement is seen in around 70% of patients treated with dual therapy for three months or longer.



[Q: 2583] OnExamination 2012 - Haematology

A 74-year-old man is being managed at the haematology/oncology clinic for suspected myeloma. He complains of symptoms of increasing shortness of breath over the past few weeks, with increased lethargy, decreased exercise tolerance, and increasing lower limb oedema.

On examination he looks pale, his BP is 139/81 mmHg, pulse 89. His heart sounds are normal, but there are bilateral crackles on auscultation of the chest and he has pitting lower limb oedema.

Investigations show

Haemoglobin 10.2 g/dl(13.5-18)

White cell count $8.7 \times 10^9/L$ (4-10)

Platelets $185 \times 10^9/L$ (150-400)

Sodium 140 mmol/l (134-143)

Potassium 4.3 mmol/l (3.5-5)

Creatinine $135 \mu\text{mol/l}$ (60-120)

Albumin 22 g/l (35-50)

Urine Protein +++

What is the most likely cause of his underlying proteinuria?

- 1- AA amyloidosis
- 2- AL amyloidosis
- 3- BPP amyloidosis
- 4- Cystatin C amyloidosis
- 5- Glomerulonephritis

Answer & Comments

Answer: 2- AL amyloidosis

AL amyloidosis is associated with deposition of immunoglobulin light chains, and is caused by multiple myeloma.

He has a mixed picture of heart failure and proteinuria which is likely to be due to both cardiac and renal amyloid deposition. Given

his degree of hypoalbuminaemia it is likely that light chains would be easily detectable in the urine.

AA amyloidosis occurs in conjunction with systemic inflammatory conditions, cystatin C amyloidosis in conjunction with Icelandic hereditary cerebral haemorrhage and amyloidosis, and beta protein precursor amyloidosis with Alzheimer's disease and Down's syndrome.

Treatment is driven by chemotherapy for the underlying myeloma.



[Q: 2584] OnExamination 2012 - Haematology

A 48-year-old woman with a history of epilepsy and ischaemic heart disease presented with the following full blood count.

Haemoglobin 7.4 g/dL (11.5 - 16.5)

Mean cell volume 125 fL (80 - 96)

White cell count $2.5 \times 10^9/L$ (4 - 11)

Platelet count $130 \times 10^9/L$ (150 - 400)

Which of the following medications is the most likely cause?

- 1- Carbamazepine
- 2- Clopidogrel
- 3- Furosemide
- 4- Phenytoin
- 5- Spironolactone

Answer & Comments

Answer: 4- Phenytoin

There is a macrocytic anaemia with low platelets and WCC typical of a nutritional deficiency.

Phenytoin can lead to folate deficiency and is therefore the most likely cause.



[Q: 2585] OnExamination 2012 - Haematology

A 45-year-old man is diagnosed with acute promyelocytic leukaemia.

Which of the following chromosomal translocations is associated with this type of leukaemia?

- 1- t(8;9)
- 2- t(8;21)
- 3- t(9;22)
- 4- t(15;17)
- 5- t(17;22)

Answer & Comments

Answer: 4- t(15;17)

Acute promyelocytic leukaemia is characterised by a chromosomal translocation involving the retinoic acid receptor-alpha gene on chromosome 17 (RARA).

In 95% of cases, retinoic acid receptor-alpha (RARA) gene on chromosome 17 is involved in a reciprocal translocation with the promyelocytic leukaemia gene (PML) on chromosome 15.



[Q: 2586] OnExamination 2012 - Haematology

Interferon alpha immunotherapy is used as treatment of which for the following conditions?

- 1- Acute lymphoblastic leukaemia
- 2- Acute myeloid leukaemia
- 3- Burkitt's lymphoma
- 4- Hairy cell leukaemia
- 5- Myelodysplastic syndrome

Answer & Comments

Answer: 4- Hairy cell leukaemia

"Interferon-alpha is an immune system hormone which is very helpful to a relatively small number of patients, and somewhat helpful to most patients. Most commonly, the drug helps stabilize the disease or produce a slow, minor improvement. The typical dosing schedule injects 3 million units of Interferon-alpha (not pegylated versions) three times a week, although the original protocol began with six months of daily injections." Wikipedia: Hairy Cell Leukaemia



[Q: 2587] OnExamination 2012 - Haematology

A 34-year-old Asian lady presented with tiredness and lethargy.

Her full blood count shows:

Haemoglobin 10.3 g/dL(11.5-16.5)

Platelet count $320 \times 10^9/L$ (150-400 $\times 10^9$)

White cell count $10.6 \times 10^9/L$ (4-11 $\times 10^9$)

MCV 68 fL(80-96)

HbA₂ 5.2%(2-3)

Which of the following is the most likely diagnosis?

- 1- Acute myeloid leukaemia
- 2- Beta-thalassaemia major
- 3- Beta-thalassaemia trait
- 4- Hereditary spherocytosis
- 5- Sickle cell disease

Answer & Comments

Answer: 3- Beta-thalassaemia trait

Microcytic anaemia would immediately raise the suspicion of iron deficiency perhaps from gastrointestinal or menstrual blood loss. However, the MCV here is disproportionately low. This combined with a raised HbA₂ makes the diagnosis of beta-thalassaemia trait the most likely diagnosis.

"The diagnosis of beta thalassemia minor usually is suggested by the presence of an isolated, mild microcytic anemia, target cells on the peripheral blood smear, and a normal red blood cell count. An elevation of Hb A₂ (2 alpha-globin chains complexed with 2 delta-globin chains) demonstrated by electrophoresis or column chromatography confirms the diagnosis of beta thalassemia trait. The Hb A₂ level in these patients usually is approximately 4-6%. In rare cases of concurrent severe iron deficiency, the increased Hb A₂ level may not be observed, although it becomes evident with iron repletion. The increased Hb A₂ level also is not observed in patients with the rare delta-beta thalassemia trait." eMedicine



[Q: 2588] OnExamination 2012 - Haematology

A 39-year-old male is receiving cisplatin based chemotherapy as adjuvant therapy for lymphoma.

Which of the following is a typical side effect of cisplatin?

- 1- Cerebellar ataxia
- 2- Haemorrhagic cystitis
- 3- Optic neuritis
- 4- Ototoxicity
- 5- Rhabdomyolysis

Answer & Comments

Answer: 4- Ototoxicity

Typical side effects of cisplatin include

Marrow toxicity

Ototoxicity

Peripheral neuropathy

Nephrotoxicity

Alopecia

Changes in taste.

Although optic neuritis is described it is not a typical side effect.



[Q: 2589] OnExamination 2012 - Haematology

A 28-year-old primigravid woman developed a swollen painful left leg at 12 weeks gestation.

Doppler ultrasound of her leg venous system showed a left popliteal vein thrombosis.

Which one of the following treatments is associated with the greatest risk to the fetus?

- 1- Aspirin
- 2- Intravenous unfractionated heparin
- 3- Subcutaneous low molecular weight heparin
- 4- Subcutaneous unfractionated heparin
- 5- Warfarin

Answer & Comments

Answer: 5- Warfarin

Oral anticoagulants are teratogenic and should not be given in the first trimester of pregnancy. Oral anticoagulants cross the placenta, and increase the risk of fetal and placental haemorrhage.

Aspirin appears to be relatively safe, as are heparins.



[Q: 2590] OnExamination 2012 - Haematology

A 23-year-old footballer was prescribed ibuprofen by his GP for a sprained ankle. Several hours later he felt very unwell and was passing dark urine.

The peripheral blood film shows many schistocytes.

The laboratory results show:

Haemoglobin <9 g/dL(13.0-18.0)

WBC $7 \times 10^9/L$ (4-11) with normal differentials

Platelets $450 \times 10^9/L$ (150-400)

Reticulocyte count 5%(0.5-2.4)

Bilirubin 40 mol/L(1-22)

What is the most likely cause for his presentation?

- 1- Allergic reaction
- 2- Autoimmune haemolytic anaemia
- 3- Glucose-6-phosphate dehydrogenase deficiency
- 4- Paroxysmal nocturnal haemoglobinuria
- 5- Pyruvate kinase deficiency

Answer & Comments

Answer: 3- Glucose-6-phosphate dehydrogenase deficiency

This is a case of intravascular haemolysis with haemoglobinuria.

The patient has a history of taking ibuprofen which is an oxidant and causes haemolysis in patients with G-6-PD deficiency.

Oxidative stressors can be infectious agents, drugs, chemicals and certain legumes. In G-6-PD deficient patients, oxidative stress exposes interior sulfhydryl groups that are oxidised and cannot be reduced, leading to irreversible denaturation of the haemoglobin with Heinz body formation.

Schistocytes are red blood cell fragments that result from membrane damage. They are sometimes referred to as 'bite cells'.



[Q: 2591] OnExamination 2012 - Haematology

What is the mechanism of action of low molecular weight heparin?

- 1- Activation of plasminogen
- 2- Chelation of calcium
- 3- Inhibition of activated factor X
- 4- Inhibition of antithrombin

5- Inhibition of vitamin K-dependent carboxylase

Answer & Comments

Answer: 3- Inhibition of activated factor X

The shorter chain low molecular weight (LMW) fractions of heparin inhibit activated factor X but have less effect on thrombin (and on coagulation in general) than the high molecular weight (HMW) species.



[Q: 2592] OnExamination 2012 - Haematology

A 45-year-old woman presents with a one year history of weight gain and intermittent sweating.

What is the most likely diagnosis?

- 1- Carcinoid syndrome
- 2- Hypothyroidism
- 3- Insulinoma
- 4- Lymphoma
- 5- Pheochromocytoma

Answer & Comments

Answer: 3- Insulinoma

The clinical scenario is classic of insulinoma.

Weight gain is the key differentiating feature here - sweating being more commonly shared with the other conditions except hypothyroidism. There is nothing else offered, other than insulinoma, that explains both symptoms in this middle aged woman.

As primary ovarian failure is not offered which would seem the most probable answer then the features would otherwise suggest an insulinoma which is commoner in females and unlike carcinoid and lymphoma is associated with weight gain rather than weight loss.

Pheochromocytoma is associated with bouts of sweating but not weight gain - there is also

no mention of other typical features such as palpitations and hypertension.



[Q: 2593] OnExamination 2012 - Haematology

A patient who received total body irradiation for the treatment of Hodgkin's lymphoma develops graft versus host disease (GVHD).

Which of the following blood products is likely to have caused this?

- 1- Cryoprecipitate
- 2- FFP
- 3- Frozen deglycerolised red blood cells
- 4- Immunoglobulin
- 5- Packed red blood cells

Answer & Comments

Answer: 5- Packed red blood cells

Graft versus host disease (GVHD) occurs when donor lymphocytes engraft in a susceptible recipient.

Products implicated in cases of transfusion associated (TA)-GVHD include:

Non-irradiated whole blood

Packed red blood cells

Platelets

Granulocytes and

Fresh non-frozen plasma.

The following have not been implicated:

Frozen deglycerolised red blood cells

Fresh frozen plasma and

Cryoprecipitate.



[Q: 2594] OnExamination 2012 - Haematology

A patient attends for breast screening and asks you the following questions.

Which statement is correct?

- 1- Early diagnosis does not change the rate of death from breast cancer
- 2- In young patients with a BRCA mutation, mammographic screening has a low sensitivity for detecting tumours
- 3- Mammographic screening is more sensitive in patient groups with denser breast tissue
- 4- Mammographic screening is offered to all women aged 20-75 years
- 5- p53 mutation is a commonly identified in subjects with breast cancer

Answer & Comments

Answer: 2- In young patients with a BRCA mutation, mammographic screening has a low sensitivity for detecting tumours

In young patients mammograms are not particularly sensitive in detecting tumours. This is because their breast tissue is denser than in older patients. MRI and ultrasound may help to delineate breast cancer in such patients. Mammography is more sensitive in older patient groups partly because in general the breast tissue is less dense.

Mammographic screening of all women between the ages of 50 and 70 years can reduce mortality from breast cancer by 25%. There is no consensus regarding the value of breast cancer screening among women who are 40- to 49-years-old. There is no evidence for routine screening below this age.

The presence of a germ-line mutation of the BRCA1 or BRCA2 gene increases the risk of breast cancer considerably, and patients with these mutations should be offered the opportunity to receive screening at much younger than 50 years.

p53 mutations are the most common genetic change identified in human neoplasia. In breast carcinoma it is associated with more aggressive disease, and worse overall survival. The frequency is, however, lower in breast

carcinoma than in other solid tumours, with an overall frequency of approximately 20%. There are certain forms of breast carcinoma, for example medullary, which have a much higher frequency.



[Q: 2595] OnExamination 2012 - Haematology

A 73-year-old man presented with a two week history of breathlessness and easy bruising.

Investigations show:

Haemoglobin 6.9 g/dL (13.0-18.0)

White cell count $0.4 \times 10^9/L$ (4-11)

Platelet count $9 \times 10^9/L$ (150-400)

Bone marrow aspirate all cellular elements reduced.

Which drug is the most likely cause of these abnormalities?

- 1- Aciclovir
- 2- Amiloride
- 3- Amoxicillin
- 4- Paracetamol
- 5- Trimethoprim

Answer & Comments

Answer: 5- Trimethoprim

There is a pancytopenia and marrow aspirate shows reduction in production of all cellular elements.

Trimethoprim is the drug most likely of these five to cause depression of haematopoiesis as this picture would be particularly unusual with paracetamol, amiloride, aciclovir and amoxicillin.



[Q: 2596] OnExamination 2012 - Haematology

A 56-year-old male was admitted for a total hip replacement due to osteoarthritis. There

was no other medical history and physical examination was normal.

A routine pre-operative full blood count (FBC) showed:

Haemoglobin 11 g/dL (13.0-18.0)

Platelet count $170 \times 10^9/L$ ($150-400 \times 10^9$)

White cell count $25 \times 10^9/L$ ($4-11 \times 10^9$)

Neutrophil count $5 \times 10^9/L$ ($1.5-7 \times 10^9$)

Lymphocyte count $19 \times 10^9/L$ ($1.5-4 \times 10^9$)

Monocyte count $0.9 \times 10^9/L$ ($0-0.8 \times 10^9$)

Eosinophil count $0.1 \times 10^9/L$ ($0.04-4 \times 10^9$)

Basophil count $0.08 \times 10^9/L$ ($0-0.1 \times 10^9$)

His blood film shows mature lymphocytes.

What is the most appropriate initial management for this patient?

- 1- Cancel the patient's operation
- 2- Chlorambucil
- 3- Fludarabine
- 4- Observation
- 5- Prednisolone

Answer & Comments

Answer: 4- Observation

The most significant abnormality on the full blood count is the lymphocytosis, with mature lymphocytes seen on film.

In this age group the most likely diagnosis is a low grade lymphoproliferative disorder, for example, chronic lymphocytic leukaemia. This, as mentioned, is a low grade condition, and does not require immediate treatment; patients undergo a period of observation, often quite long, before any treatment is indicated.

The indication for treatment would include:

Disabling B symptoms

Lymphocyte doubling time of less than six months

Bone marrow compromise

Autoimmune haemolysis or immune thrombocytopenia.

He is never going to be cured from this condition, and therefore it would not be necessary to delay/ cancel surgery. He may be slightly more at risk of infection, due to immune dysfunction that accompanies these conditions, and the surgeons should be aware of this.



[Q: 2597] OnExamination 2012 - Haematology

A 17-year-old male with glucose-6-phosphate dehydrogenase (G6PD) deficiency presents with tiredness and is noticed to be jaundiced. These features have developed since he developed a mild chest infection one week ago.

Which one of the following is the most likely haematological finding?

- 1- Haemoglobinuria
- 2- Low mean cell volume
- 3- Positive direct antiglobulin test
- 4- Reduced reticulocyte count
- 5- Spherocytes present on blood film

Answer & Comments

Answer: 1- Haemoglobinuria

G6PD deficiency is a red cell enzymopathy that can lead to acute intravascular haemolysis after exposure to certain drugs, infection, etc.

You would therefore get haemoglobinuria but would not get a positive direct antiglobulin test. The mean corpuscular volume (MCV) and reticulocyte count would be high due to haemolysis.

There is a form of G6PD deficiency where there is a chronic low level haemolysis where there are spherocytes seen - but the clinical information points to intravascular haemolysis after an infection.



[Q: 2598] OnExamination 2012 - Haematology

A 25-year-old female with a history of type 1 von Willebrand's (vWBD) disease is referred for an opinion. She is to have a cervical cone biopsy and the admitting team are concerned about her clotting.

You find that she has a past history of menorrhagia and has had two dental extractions as an adolescent that were uncomplicated.

What is the most useful test to assess her bleeding tendency?

- 1- Activated partial thromboplastin time
- 2- Bleeding time
- 3- Plasma factor VIII activity
- 4- Platelet aggregation
- 5- Prothrombin time

Answer & Comments

Answer: 3- Plasma factor VIII activity

In type I vWBD the prothrombin time (PT) and platelet aggregation will be normal.

Bleeding time, activated partial thromboplastin time (APTT) and FVIIIc are likely to be abnormal.

The bleeding time would be a good screening test, but as we already know she has type I vWBD it will not give a quantitative measurement of her bleeding tendency.

Similarly APTT will not be that useful.

The most useful test in practice is to do the vWB antigen and activity (RICO); But you would also do FVIIIc as this is also low in vWD.



[Q: 2599] OnExamination 2012 - Haematology

By which of the following can folic acid metabolism be affected?

- 1- Brufen
- 2- Penicillin
- 3- Pyrimethamine
- 4- Tetracycline
- 5- Vitamin B₁₂

Answer & Comments

Answer: 3- Pyrimethamine

Drugs which inhibit dihydrofolate reductase are:

Methotrexate

Pyrimethamine and

Trimethoprim.

Drugs which interfere with absorption/storage of folate are:

Phenytoin

Primidone

Oral contraceptives.



[Q: 2600] OnExamination 2012 - Haematology

Concerning immune cell antigen receptors, which of the following statements is false?

- 1- Affinity maturation of the B cell receptor is an important process initiated during the primary immune response
- 2- IgD are surface receptors of B lymphocytes
- 3- In normal individuals T lymphocytes with T cell receptors (TCR) that recognise autoantigens are all deleted to prevent autoimmunity
- 4- TCRs with different antigen specificities can be co-expressed on a single T lymphocytes

- 5- The antigen specificity of the T cell receptor is generated during development

Answer & Comments

Answer: 3- In normal individuals T lymphocytes with T cell receptors (TCR) that recognise autoantigens are all deleted to prevent autoimmunity

T and B lymphocytes express receptors on their surface that recognise antigen in a specific manner. Each individual lymphocyte expresses a single type of receptor with unique specificity (except dual specificity T cells - see below).

The receptor on the B lymphocyte is membrane bound immunoglobulin (IgM and IgD isotype) and recognises particulate antigen, whilst the TCR is a heterodimer that recognises peptide fragments presented by MHC molecules.

The antigen specificity of T and B cells is generated during development by recombination of gene segments encoding the variable domains (antigen recognition domains) of immune receptors. These gene recombinations are random and maturing lymphocytes that express autoreactive receptors which are then deleted or rendered anergic. These processes take place in the thymus (T lymphocytes) and in the bone marrow (B lymphocytes).

However, not all autoreactive lymphocytes are deleted during development. In the case of T lymphocytes, not all proteins are expressed in the thymus, and those that are present only in the periphery or at certain stages of development will encounter mature T cells that can respond to them. Thus, autoreactive T cells exist in the periphery and other mechanisms are responsible for the protection of the body against autoimmunity.

Affinity maturation refers to the process of progressive development of immunoglobulin with higher affinity to the antigen. This occurs

in the germinal centres of lymphoid organs during the evolution of the humoral response and is accomplished by hypermutation of the variable region genes. T cells with dual specificities have been reported although their function is unknown.



[Q: 2601] OnExamination 2012 - Haematology

A 40-year-old woman presents to her GP with a left sided breast lump.

On examination it measures approximately 25 mm and has associated skin tethering. Examination of her axilla reveals a 20 mm mobile lymph node, examination is otherwise unremarkable.

What is the best sequence of investigation of this lump?

- 1- CT breast, mammography, ultrasound guided fine needle aspiration
- 2- Physical examination, breast MRI, CT chest abdomen and pelvis
- 3- Physical examination, mammography, breast MRI
- 4- Physical examination, mammography, CT guided fine needle aspiration
- 5- Physical examination, mammography, ultrasound guided fine needle aspiration

Answer & Comments

Answer: 5- Physical examination, mammography, ultrasound guided fine needle aspiration

The triple assessment of a breast lump is essential to diagnose a breast lump accurately. It involves physical examination, mammography and then ultrasound guided FNA.

A marker may be inserted at this time if the lump is difficult to palpate to aid the surgeons at the time of excision.

Breast MRI is used when the patient presents with inflammatory breast cancer and the margins of the cancer are unclear. This aids the clinician by allowing accurate assessment of response to neo-adjuvant chemotherapy prior to surgical excision.

Staging CT is not used routinely in primary breast cancer, only if there is suspicion of metastatic spread.



[Q: 2602] OnExamination 2012 - Haematology

Which of the following observations best describes the relationship between malaria and HbS?

- 1- Patients with sickle cell disease do not get malaria
- 2- HbS protects against all complications of falciparum malaria
- 3- Only HbSS protects against malaria, HbAS is not protective
- 4- Sickle cell disease is most common in regions where P. falciparum malaria is endemic and in ethnic groups that have migrated from these areas
- 5- Malaria causes damage to red cell DNA, which is why sickle cell disease is more common in malarial regions

Answer & Comments

Answer: 4- Sickle cell disease is most common in regions where P. falciparum malaria is endemic and in ethnic groups that have migrated from these areas

The sickle cell gene is most prevalent in areas where malaria is also prevalent.

Patients with sickle cell trait have just as much risk of contracting P. falciparum malaria compared with patients with HbAA.

However, the reduced red cell life cycle in HbAS reduces parasitaemia, which reduces the risk of severe disease and neurological

complications (for example, seizures and coma).

Option A is incorrect because patients with sickle cell disease have the same risk of developing malaria as patients with HbAS or HbAA.

Option B is incorrect because HbS protects only against severe disease.

Option C is incorrect because HbAS is also protective against the complications of malaria. (In fact, patients with HbSS are at higher risk of severe malaria with complications and have a higher mortality rate.)

Option D is correct. Sickle cell disease is most prevalent in areas where malaria is endemic.

Option E is incorrect. The genetic abnormality is not caused by malaria, but the selective advantage of the carrier state in malarial regions has allowed it to persist in the gene pool (positive selective evolutionary pressure).



[Q: 2603] OnExamination 2012 - Haematology

A 56-year-old man is being reviewed for an elective cholecystectomy in the pre-operative clinic.

He has no co-morbidities apart from two attacks of cholecystitis in the last 12 months. He has never received a blood transfusion in the past.

The request for the blood bank should include which of the following?

- 1- Group and save, direct Combs' test (DAT) and across match for 2 units
- 2- Group and save only
- 3- Group and save as well as cross match
- 4- Cross match for 3 units only
- 5- Group and Save, DAT and a cross match for 3 units.

Answer & Comments

Answer: 2- Group and save only

A 'group and save' is adequate for elective surgeries and is standard practise in most modern blood banks. This will involve blood grouping and its confirmation as well as an antibody screen (option B).

Other options include crossmatch and a direct Coombs' test (options A, C, D and E) which are often done only if the antibody screen test is positive - these are not routinely done for elective surgery unless the patient has had a recent blood transfusion or a history of previous known red cell antibodies.



[Q: 2604] OnExamination 2012 - Haematology

Which of the following is true about manufacture of pooled plasma derivatives?

- 1- Pooled plasma is often sourced from within the UK
- 2- These are usually manufactured from 10 donors at a time
- 3- The process does not involve any viral inactivation steps
- 4- The end product is a freeze dried product
- 5- These products have a short half life typically days.

Answer & Comments

Answer: 4- The end product is a freeze dried product

The plasma derivatives (such as factor VIII) are prepared from several thousand plasma donations typically 20 000 or 5000 kg of plasma at a time (hence not option B).

Pooled plasma has been sourced from outside UK since 1999 to avoid vCJD risks (hence not option A).

The process involves several chemical steps including ethanol extraction, chromatography

and viral inactivation steps (hence not option C) which results in a freeze dried product (option D).

These products have a long shelf life of several months to years (hence not option E).



[Q: 2605] OnExamination 2012 - Haematology

A 72-year-old woman is admitted by the orthopaedic surgeons for a routine left total hip replacement (THR). She has no past medical history of note apart from well controlled hypertension which is currently managed with a combination of ramipril and amlodipine.

On examination her BP is 142/82 mmHg, her pulse is 75 and regular, her BMI is 23 kg/m². She looks pale, cardiovascular and respiratory examination is unremarkable, but she has splenomegaly on examination of the abdomen.

Investigations show

Haemoglobin 10.4 g/dl(11.5-16.5)

White cell count 35.1 x 10⁹/L

Lymphocytes 31.2(4-11)

Platelets 180 x 10⁹/L (150-400)

Serum sodium 138 mmol/l (135-146)

Serum potassium 4.4 mmol/l (3.5-5)

Creatinine 115 mmol/l (79-118)

Bone marrow aspirate Lymphocytic infiltration

Which of the following is the most appropriate course of action?

- 1- Chlorambucil
- 2- Cyclophosphamide
- 3- Lenalidomide
- 4- Proceed with the hip replacement
- 5- Rituximab

Answer & Comments

Answer: 4- Proceed with the hip replacement

This patient has chronic lymphocytic leukaemia (CLL).

Indications for intervention are very clear, and the implication in this case is that the patient has no symptoms from her CLL.

Guidelines suggest that chemotherapy should be considered when one of the following conditions is satisfied.

Weight loss more than 10%

Extreme fatigue

Progressive marrow failure

Autoimmune anaemia or thrombocytopenia not responding to prednisolone

Progressive splenomegaly

Massive lymphadenopathy or progressive lymphocytosis

Progressive lymphocytosis (an increase of more than 50% in two months or a doubling time of less than six months).

From the history we are given she currently satisfies none of these conditions and can proceed to THR.



[Q: 2606] OnExamination 2012 - Haematology

A 53-year-old woman with inoperable cancer has pain due to posterior abdominal wall infiltration. This has been controlled well with Kapake (codeine 30 mg and paracetamol 500 mg), two tablets four times per day.

The patient has been admitted with nausea and vomiting the cause of which is, as yet, unknown. Because she cannot retain her analgesics, she has severe pain in her loin.

What is the best option for controlling her pain until the vomiting settles?

1- Fentanyl skin patch

2- Intramuscular pethidine

3- Morphine four hourly orally and as needed intramuscularly

4- Rectal non-steroidal anti-inflammatory drug

5- Subcutaneous diamorphine by continuous infusion

Answer & Comments

Answer: 5- Subcutaneous diamorphine by continuous infusion

This patient has inoperable carcinoma and already needs opiate analgesia orally; as she is vomiting she will need parenteral analgesia.

The most effective way of achieving this, and being able effectively to titrate the dose to achieve adequate analgesia, is subcutaneous diamorphine by continuous infusion.

Fentanyl patches are difficult to titrate because they are used for 72 hours. You usually therefore only use them once a patient has a stable opiate usage. Intramuscular pethidine has a delayed onset and its effect is prolonged, which again is not ideal when you do not know what the patient's opiate requirements are. Oral morphine is unlikely to be tolerated whilst she is vomiting. Non-steroidals are unlikely to be sufficient in this case.



[Q: 2607] OnExamination 2012 - Haematology

Which of the following statements concerning abnormalities of the haemoglobin molecule is true?

1- Alpha thalassaemia is due to a deficiency of beta-chain production

2- HbS is caused by a single base mutation on the beta-chain

3- Genes for the alpha and beta chains are located on the same chromosome

4- In thalassaemia, persistence of HbF is an adverse prognostic sign

- 5- Oligonucleotide probes may assist in the diagnosis of haemoglobinopathies in adolescents

Answer & Comments

Answer: 2- HbS is caused by a single base mutation on the beta-chain

A. Alpha thalassaemia is due to abnormalities of the alpha chain. Persistence of HbF has survival advantages in severely affected subjects.

C. Alpha is located on 16, beta on 11.

E. Hb electrophoresis are used in the adult, rather than oligonucleotide probes as used in the fetus.



[Q: 2608] OnExamination 2012 - Haematology

A 65-year-old lady with a history of recurrent DVT has been weaned off her warfarin and started on intravenous heparin prior to cardiac bypass for ischaemic heart disease.

She seems to require very high doses of heparin to achieve adequate anticoagulation especially during surgery.

Which of the following conditions would explain her thrombophilia and her heparin resistance?

- 1- Activated protein C resistance
- 2- Antithrombin III deficiency
- 3- Lupus anticoagulant
- 4- Protein C deficiency
- 5- Protein S deficiency

Answer & Comments

Answer: 2- Antithrombin III deficiency

"Cardiac surgery produces a unique activation of coagulation due to the presence of the cardiopulmonary bypass (CPB) circuit. Whilst not yet fully elucidated, the mechanisms of

activation of coagulation during CPB may involve activation of fX by the tissue factor-mediated pathway within the pericardial cavity, in addition to direct generation of fXa on the surface of monocytes by Cathepsin G, a substance released from activated monocytes. The inhibition of fXa in these situations involves the AT-dependent mechanism of action of heparin." British Journal of Anaesthesia, 2002, Vol. 88, No. 4 467-469



[Q: 2609] OnExamination 2012 - Haematology

A 60-year-old patient with metastatic breast carcinoma attends clinic complaining of pain in the jaw and ulceration within the oral cavity which has persisted for four weeks following a dental extraction. She has had a course of antibiotic therapy for suspected secondary infection of the ulceration.

On examination there is ulceration within the oral cavity which extends as far as the underlying mandible.

Which of the following drugs is likely to be responsible for her presentation?

- 1- Anastrozole
- 2- Diclofenac
- 3- Prednisolone
- 4- Tamoxifen
- 5- Zoledronic acid

Answer & Comments

Answer: 5- Zoledronic acid

The likely causative agent is the nitrogen containing bisphosphonate zoledronic acid.

The clinical scenario suggests a diagnosis of bisphosphonate associated osteonecrosis of the jaw. This is a recently recognised adverse effect of bisphosphonate therapy. This is a consequence of potent anti-resorptive action of the nitrogen containing bisphosphonates.

Most cases have been associated with zoledronic acid and pamidronate given intravenously for metastatic bone disease. The reported incidence in patients with malignancy treated with these drugs is between 1.3-4.0%.

Dental disease is a recognised predisposing factor.

The lesions usually heal with minimal surgical debridement, chlorhexidine mouthwashes, antibiotics and analgesia.



[Q: 2610] OnExamination 2012 -
Haematology

An 80-year-old man presents with tiredness and weakness.

A diagnosis of myelodysplastic syndrome is suspected.

Which of the following statements regarding myelodysplastic syndrome is correct?

- 1- Absence of ring sideroblasts on the blood film excludes myelodysplasia as a diagnosis
- 2- Cytotoxic chemotherapy is likely to be part of his treatment
- 3- He is more likely to die from an infection than from leukaemic transformation
- 4- If blast cells constitute 1% of the total white cells, this signifies leukaemic transformation.
- 5- On a blood film, neutrophils typically show toxic granulation

Answer & Comments

Answer: 3- He is more likely to die from an infection than from leukaemic transformation

The patient has myelodysplastic syndrome (MDS).

Myelodysplastic syndrome is a disease of old age. Men are affected more frequently than women. 80% of patients present because of symptoms of anaemia. The blood film typically

shows pancytopenia with hypogranular neutrophils. The number of blasts seen varies.

The disease can be classified into the following subtypes(WHO classification 2008):

1. Refractory anaemia with unilineage dysplasia- ie anaemia , neutropaenia or thrombocytopaenia (<5% blasts)
2. Refractory anaemia with ring sideroblasts (<5% blasts; >15% sideroblasts)
3. Refractory anemia with multilineage dysplasia (based on bone marrow dysplasia in 2 or more myeloid lineages)
3. Refractory anaemia with excess blasts-1(5-9% blasts) and refractory anemia with excess blasts -2 (10-19%)
5. Myelodysplasia unclassified
6. Myelodysplasia with isolated 5qdel(cytogenetic abnormality with prognostic significance)

Blasts > 20% is now classified as acute myeloid leukemia.

Few patients require aggressive therapy and most need only supportive care. As the vast majority are elderly patients with other medical conditions, excessive intervention is unwarranted.

Transfusions of packed red cells or platelets may be required and antibiotics for intercurrent infections.

Granulocyte-colony stimulating factor (G-CSF) and recombinant erythropoietin (r-Epo) can improve blood counts. Aggressive cytotoxic chemotherapy is generally reserved for treatment of transformation to acute myelogenous leukemia (AML) in younger patients.

Median survival is two years. Patients are more likely to have serious infections or life-threatening bleeds than blastic transformation.



[Q: 2611] OnExamination 2012 -
Haematology

A 30-year-old female presents to the antenatal clinic with her first pregnancy.

During the interview she reports that she has been entirely well but her sister had suffered a deep vein thrombosis in her second pregnancy. A thrombophilia screen shows that she is heterozygous for factor V Leiden (FVL).

Which is the most appropriate action for this patient?

- 1- She should be informed to seek medical attention if she becomes aware of calf swelling or pain
- 2- She should be treated with aspirin 75 mg daily
- 3- She should be treated with prophylactic low molecular weight heparin
- 4- She should be treated with prophylactic unfractionated heparin
- 5- She should receive warfarin

Answer & Comments

Answer: 1- She should be informed to seek medical attention if she becomes aware of calf swelling or pain

Although she is heterozygous for factor V Leiden, she has not had a previous thrombotic event.

There is no need to anticoagulate her throughout pregnancy. However she is at increased risk - pregnant and FVL - and should be very alert to the symptoms and signs of a thrombotic event.

There is no evidence of benefit from aspirin to reduce her thrombotic risk.

For more information on this topic please see the following link to the RCOG guideline:

<http://www.rcog.org.uk/files/rcog-corp/GTG37aReducingRiskThrombosis.pdf>



[Q: 2612] OnExamination 2012 -
Haematology

A 65-year-old lady presents with weight loss, lethargy and lower limb weakness. She is now unable to mobilise without assistance and complains of some urinary incontinence.

On examination she is cachectic and there is a fungating mass in her left breast. She is able to move her hips but has quadriceps wasting and fasciculation bilaterally. She is unable to flex or extend her knees with absent knee jerks. She has power 1/5 for dorsiflexion and extension with evidence of clonus and positive Babinski sign. She has reduced anal tone and saddle paraesthesia.

What is the diagnosis?

- 1- Amyotrophic lateral sclerosis
- 2- Brown-Sequard syndrome
- 3- Cauda equina syndrome
- 4- Conus medullaris syndrome
- 5- Subacute combined degeneration of the cord

Answer & Comments

Answer: 4- Conus medullaris syndrome

This lady has breast cancer which is disseminated and gone to her spine to cause compression.

There is compression of the conus medullaris to give her a mixture of upper and lower motor signs (LMN). Because of the anatomy of the spinal cord if there is compression at the level of the conus medullaris some of the cord is compressed to cause upper motor (UMN) signs and some of the nerves are compressed to give lower motor signs. Hence she has UMN signs in L5-S2 but LMN signs in L3-4.

Cauda equina would give just LMN signs, and so she would not have positive Babinski sign and clonus.

Amyotrophic lateral sclerosis is the commonest form of motor neurone disease. There would be a mixture of UMN and LMN signs; however they do not have any sensory signs or incontinence.

Brown-Sequard syndrome is due to hemisection of the cord and so the patient will have UMN signs in one leg and loss of pain and temperature sensation in the contralateral leg.

Subacute combined degeneration of the cord is due to degeneration of the posterior and lateral spinal columns. It can cause bilateral spastic paresis with loss of vibration sensation, tingling and positive Babinski's sign. It is due to B vitamin deficiency or Friedreich's ataxia.



[Q: 2613] OnExamination 2012 - Haematology

A 45-year-old man is to undergo knee surgery. He has a history of factor IX deficiency. You are concerned about the prospect of significant bleeding during surgery.

Which of the following is most likely to reduce his risk of bleeding?

- 1- Mefenamic acid
- 2- Tranexamic acid
- 3- Vasopressin
- 4- Vitamin K
- 5- von Willebrand factor

Answer & Comments

Answer: 2- Tranexamic acid

Tranexamic acid inhibits thrombolysis without increasing the risk of thrombosis. As such it may be of value in patients undergoing surgery who have inherited factor IX deficiency in order to reduce the perioperative risk of bleeding.

Recombinant factor IX is of course also an option where it is available, although patients

have a high tendency to form neutralising antibodies to factor IX.

Vasopressin is associated with a significant increase in levels of both factor VIII and von Willebrand factor in haemophilia A.

Any increase seen in factor IX levels after vasopressin is however much more minor. As such tranexamic acid is a much more useful therapeutic choice.

None of the other options given has any role in the management of factor IX deficiency.



[Q: 2614] OnExamination 2012 - Haematology

By what mechanism does topoisomerase catalyse DNA replication?

- 1- Acts as a promoter
- 2- DNA synthesis
- 3- Helix torsion release
- 4- Homologous repair
- 5- Non-homologous end joining

Answer & Comments

Answer: 3- Helix torsion release

Topoisomerase releases torsion in the DNA helix during replication.

It accomplishes this by cutting the DNA helix at specific points to allow it to unravel and then ligates the ends together again. This allows large proteins such as DNA polymerase to replicate DNA along the sequence.

Topoisomerase is therefore an important target for chemotherapeutic agents such as topotecan which can arrest cells in S-phase and induce apoptosis.



[Q: 2615] OnExamination 2012 - Haematology

A patient with Hodgkin's lymphoma undergoes mantle field radiotherapy.

Several months later the patient complains that when they flex or extend their neck they feel an electric shock phenomenon down their back and into their limbs.

What is the patient describing?

- 1- Cervical arthritis
- 2- Cervical spine stenosis
- 3- Lhermitte's sign
- 4- Malignant spinal cord compression
- 5- Uhthoff's phenomenon

Answer & Comments

Answer: 3- Lhermitte's sign

Lhermitte's sign is classically associated with multiple sclerosis and suggests a lesion of the dorsal columns of the cervical cord or of the caudal medulla.

Radiation myelopathy is a potential cause of this but it can also be present in many other conditions, for example vitamin B₁₂ deficiency.

If following radiotherapy it usually resolves in two to three months.



[Q: 2616] OnExamination 2012 - Haematology

A 35-year-old woman presents to the oncology clinic with post-coital bleeding. A cervical biopsy confirmed a squamous cell carcinoma of the cervix.

With which of the following strain variations of human papilloma virus (HPV) is she likely to be infected?

- 1- 1 and 2
- 2- 2 and 8
- 3- 8 and 16
- 4- 16 and 18
- 5- 18 and 22

Answer & Comments

Answer: 4- 16 and 18

Cervical cancer is the most common cancer worldwide and is associated with HPV 16 and 18 in approximately 70% of cases.

New vaccines are currently available in the United Kingdom to help immunise against this virus and hopefully prevent future cases of cervical cancer.



[Q: 2617] OnExamination 2012 - Haematology

What is the best initial investigation for a patient with suspected malignant spinal cord compression?

- 1- CT chest, abdomen and pelvis
- 2- MRI brain
- 3- MRI spine
- 4- Nerve conduction studies
- 5- Spinal x ray

Answer & Comments

Answer: 3- MRI spine

Due to the spine being compressed by a soft tissue lesion MRI gives the best image quality to identify the site of disease accurately and to allow prompt treatment with either radiotherapy or surgical decompression.



[Q: 2618] OnExamination 2012 - Haematology

Which of the following histopathological subtypes is essential for successful treatment with cetuximab?

- 1- Her-2/neu negative
- 2- Her-2/neu positive
- 3- K-ras mutated
- 4- K-ras wild-type
- 5- VEGF overexpression

Answer & Comments

Answer: 4- K-ras wild-type

Cetuximab is licensed by NICE in metastatic colorectal cancer for k-ras wild-type proven patients who require downstaging prior to surgical resection of liver metastatic disease. This is always given in combination with chemotherapy and causes an acne type rash as its major side effect.

Her-2 status is currently only required in breast cancer patients for consideration of treatment with Herceptin; there are trials currently underway researching its role in treatment of other cancers such as gastric cancer.



[Q: 2619] OnExamination 2012 - Haematology

A 30-year-old woman with a strong family history of breast cancer is referred to the genetics service for counselling.

What is the DNA repair mechanism by which the BRCA1 and BRCA2 proteins act?

- 1- Base excision repair
- 2- Double strand DNA break repair
- 3- Non-homologous end joining
- 4- Nucleotide excision repair
- 5- Single strand DNA break repair

Answer & Comments

Answer: 2- Double strand DNA break repair

The BRCA proteins are involved in homologous recombination to repair DNA double strand breaks.

Mutations in either of the genes encoding these proteins puts the patient at significantly higher risk of developing breast and ovarian cancers, so that some women opt for prophylactic surgery to prevent this.

Future treatment options with PARP inhibitors take advantage of this deficiency in DNA repair to kill cancer cells via synthetic lethality.



[Q: 2620] OnExamination 2012 - Haematology

A 65-year-old woman presents to the oncology clinic with a two month history of cough and haemoptysis.

A suspicious lesion on a recent chest x ray was biopsied and confirms a bronchogenic adenocarcinoma.

Currently the patient is short of breath causing her to be in bed for about three hours every day. She can manage the stairs but is markedly breathless when she reaches the top. She is currently unable to work. Her husband helps around the house but she does not need help with her activities of daily living.

What is the patient's performance status, as measured on the World Health Organization scale?

- 1- 0
- 2- 1
- 3- 2
- 4- 3
- 5- 4

Answer & Comments

Answer: 3- 2

0. Asymptomatic. (Fully active, able to carry on all pre-disease activities without restriction).

1. Symptomatic but completely ambulatory. (Restricted in physically strenuous activity but ambulatory and able to carry out work of a light or sedentary nature. For example, light housework, office work).

2. Symptomatic, less than 50% in bed during the day. (Ambulatory and capable of all self-care but unable to carry out any work

activities. Up and about more than 50% of waking hours).

3. Symptomatic, more than 50% in bed, but not bedbound. (Capable of only limited self-care, confined to bed or chair 50% or more of waking hours).

4. Bedbound. (Completely disabled. Cannot carry on any self-care. Totally confined to bed or chair).

5. Death.



[Q: 2621] OnExamination 2012 - Haematology

A 16-year-old girl of African origin presents to the emergency department with a one week history fever and lethargy.

Shortly before developing her symptoms she received a course of antibiotics from her GP for an upper respiratory infection. She also complains of two to three days of pain and swelling in her hands. The patient tells you that she has had similar attacks before.

On examination she is pyrexial, with a heart rate of 109 and oxygen saturations of 91% on air. There is painful dactylitis of both her hands. The remainder of her examination was normal.

Initial investigations reveal haemoglobin of 9.3 g/dL; reticulocytes of 8 % and a white cell count of $13 \times 10^9/L$. ECG, urinalysis and electrolytes are normal. C reactive protein is 76.

You decide to treat the patient as a sickle cell crisis.

What treatment would you start in the Emergency department?

- 1- Analgesia
- 2- Analgesia and oxygen
- 3- Analgesia, oxygen and hydration
- 4- Analgesia, oxygen, hydration and antibiotics

- 5- Analgesia, oxygen, hydration, antibiotics and hydroxycarbamide

Answer & Comments

Answer: 4- Analgesia, oxygen, hydration and antibiotics

Analgesia: start with paracetamol and then add in a non-steroidal anti-inflammatory, for example, ibuprofen. If this does not control the pain then opioid analgesics should be used, for example, morphine sulphate. Often patients can give you information regarding which analgesics work for them.

Oxygen: the patient is hypoxic and will benefit from oxygen therapy. A rate of 2 L/min given via a nasal cannula should be started.

Hydration: This is important to correct any intravascular depletion. Oral fluid therapy may be sufficient but if the patient is severely dehydrated or unable to take oral fluids then intravenous therapy is required.

Antibiotics: Antibiotics should be started if there is evidence of infection, for example, green sputum, positive urinalysis, pyrexia or raised inflammatory markers. Start with broad-spectrum antibiotics and rationalise once sensitivities become available.

Hydroxycarbamide (and bone marrow transplantation) have roles to play in the management of sickle cell disease but they are not used in the acute setting.

Blood transfusion in this patient should be considered as she is anaemic with a raised reticulocyte count but you must also take into account the clinical condition of the patient.

Option A is wrong because although analgesia is indicated in this situation it is not the only treatment that you should give.

Option B is wrong because although analgesia and oxygen are indicated in this situation they are not the only treatments that you should give.

Option C is wrong because although analgesia, oxygen and hydration are indicated in this situation they are not the only treatments that you should give.

Option D is correct as it contains all the treatments that should be given in the acute setting.

Option E is wrong because although analgesia, oxygen, hydration and antibiotics are indicated in this situation hydroxycarbamide is not indicated in the acute setting.

The correct management of a sickle cell crisis would entail oxygenation, hydration with careful management of fluid balance, analgesia, predominantly based on opioids, and blood product support, including if required exchange transfusion to get the HbS fraction to less than 30%.

HbF switching therapies such as hydroxycarbamide are not instituted acutely.



[Q: 2622] OnExamination 2012 - Haematology

A 67-year-old woman presents with acute severe back pain. She is normally fit and well, but there is a strong family history of osteoporosis.

Hb 10.6 g/dl (12-16)

MCV 85 (80-90)

Calcium 2.9 mmol/l (2.2-2.6)

Phosphate 2.2 mmol/l (0.8-1.2)

Alkaline phosphatase 126 iu/l (50-150)

Total protein 76g/l (60-83)

Albumin 30g/l (35-45)

What is the most likely underlying diagnosis?

- 1- Metastatic disease
- 2- Multiple myeloma
- 3- Osteoporosis
- 4- Paget's disease

5- Sarcoidosis

Answer & Comments

Answer: 2- Multiple myeloma

This patient has hypercalcaemia/hyperphosphataemia and hyperglobulinaemia. (The globulin level is raised at 46 g/l total protein - albumin = 46. A normal level should be below 36g/l.)

This together with normocytic anaemia and probable vertebral collapse would be highly suggestive of multiple myeloma.

She needs serum immunoelectrophoresis, urinary Bence-Jones protein and bone marrow biopsy.

The hyperphosphataemia in multiple myeloma is due to reduced renal excretion which may be directly due to renal impairment or interference with excessive protein load.



[Q: 2623] OnExamination 2012 - Haematology

A 75-year-old lady is brought to the Emergency department by her next of kin after a three week history of having "gone off her feet".

A history of back pain radiating anteriorly around her chest and bilateral weakness of her legs is elicited. Physical examination shows a paraparesis.

Blood investigations are notable for haemoglobin of 9.5 g/dL, serum calcium of 3.6 mmol/L and a creatinine of 250 µmol/L.

Which of the following would be the most appropriate initial investigation?

- 1- Bone marrow biopsy
- 2- Serum protein electrophoresis, quantitative immunoglobulins and serum free light chains
- 3- CT chest, abdomen, pelvis

- 4- Urgent magnetic resonance imaging of her spine
- 5- Urine for creatinine clearance and Bence Jones protein

Answer & Comments

Answer: 4- Urgent magnetic resonance imaging of her spine

The combination of hypercalcaemia, anaemia and renal failure in a patient presenting with spinal cord compression should lead you to consider a diagnosis of multiple myeloma.

Multiple myeloma is a plasma cell disorder with a malignant clone producing a monoclonal paraprotein. Clinical manifestations relate both to substances secreted by the plasma cells and effects of marrow infiltration. Complications include pathological fractures, hyperviscosity syndrome, hypercalcaemia, renal impairment, bone pain and recurrent infections. Spinal cord compression can develop due to vertebral compression fractures or vertebral plasmacytomas.

An urgent MRI of the spine is indicated to determine whether spinal cord compression is present in view of this lady's neurology. Options A, B and E should all be done following this to determine if myeloma is the underlying diagnosis, and help guide further treatment. CT can be used to delineate the extent of disease, but is not a first line investigation for myeloma or spinal cord compression.

It is also important to realise that this level of hypercalcaemia is potentially life-threatening, with risk of arrhythmia or coma. Immediate treatment is with intravenous hydration (rapidly) followed by intravenous bicarbonate.



[Q: 2624] OnExamination 2012 - Haematology

A 76-year-old woman has had Paget's disease

of bone for at least 15 years. She develops a destructive mass in the bony pelvis and a diagnosis of primary tumour is considered.

What is the most likely primary tumour?

- 1- Chondrosarcoma
- 2- Exostosis
- 3- Multiple myeloma
- 4- Osteoma
- 5- Osteosarcoma

Answer & Comments

Answer: 5- Osteosarcoma

Paget's disease of bone usually occurs in later life.

In Paget's disease the continual repair process of bone is disturbed and ends at the stage of vascular osteoid bone. Bones are very weak.

Osteogenic sarcoma complicates 5% of cases.



[Q: 2625] OnExamination 2012 - Haematology

Which of the following best describes the function of the bcr-abl fusion protein?

- 1- Epidermal growth factor
- 2- Fibroblast growth factor
- 3- p53 inhibitor
- 4- Tyrosine kinase
- 5- Vascular endothelial growth factor

Answer & Comments

Answer: 4- Tyrosine kinase

The bcr-abl fusion protein is the proto-oncogene from the Philadelphia chromosome found in CML.

It is a potent tyrosine kinase which stimulates signal transduction and hence mitosis.



[Q: 2626] OnExamination 2012 -
Haematology

A 65-year-old man has locally advanced pancreatic cancer and has been paying privately for treatment with erlotinib (Tarceva) for the past nine months. It has worked effectively for that period but a recent CT scan showed further growth in the tumour.

Which of the following mechanisms best explains this resistance to treatment with erlotinib?

- 1- Development of antibodies to erlotinib
- 2- Lack of autophosphorylation at binding site
- 3- Malabsorption
- 4- Mutation in the ATP binding pocket of the EGFR kinase domain
- 5- Reduced expression of EGFR

Answer & Comments

Answer: 4- Mutation in the ATP binding pocket of the EGFR kinase domain

Erlotinib specifically targets the epidermal growth factor receptor (EGFR) tyrosine kinase (which is required for the conformational change) and binds in a reversible fashion to the adenosine triphosphate binding site.

For the signal to be transmitted, two members of the EGFR family need to come together to form a homodimer. These then use the molecule of adenosine triphosphate (ATP) to autophosphorylate each other, which causes a conformational change in their intracellular structure, exposing a further binding site for binding proteins that cause a signal cascade to the nucleus. By inhibiting the ATP, autophosphorylation is not possible and the signal is stopped.

A key issue with EGFR-directed treatments is that after a period of 8-12 months, the cancer cells become resistant to the treatment. This most commonly occurs due to a mutation in the ATP binding pocket of the EGFR kinase

domain. This prevents the binding of erlotinib (Tarceva).

Some IGR-1R inhibitors are in various stages of development (based either around tyrophostins such as AG1024 or AG538 or pyrrolo[2,3-d]-pyrimidine derivatives such as NVP-AEW541).



[Q: 2627] OnExamination 2012 -
Haematology

Burkitt lymphoma is associated with a mutation of which of the following genes?

- 1- BCL-6 gene
- 2- BCR-ABL gene
- 3- Cyclin D1 gene
- 4- MYC gene
- 5- RAR-alpha gene

Answer & Comments

Answer: 4- MYC gene

Burkitt lymphoma is a monoclonal proliferation of B lymphocytes which results (in approximately 90% of the cases) from chromosome translocations that involve the Myc gene.

A chromosome translocation means that a chromosome is broken which allows it to associate with parts of other chromosomes.

The classic chromosome translocation in Burkitt lymphoma involves chromosome 8, the site of the MYC gene.



[Q: 2628] OnExamination 2012 -
Haematology

Which of the following cytotoxic agents acts by inhibiting purine synthesis?

- 1- Bleomycin
- 2- Cisplatin
- 3- Doxorubicin
- 4- Methotrexate

5- Vincristine

Answer & Comments

Answer: 4- Methotrexate

Methotrexate inhibits purine synthesis. J. Biol. Chem., Vol. 262, Issue 28, 13520-13526, Oct, 1987.

The other drugs have different mechanisms of action.



[Q: 2629] OnExamination 2012 - Haematology

A 53-year-old male is receiving treatment with imatinib for chronic myeloid leukaemia.

Which of the following is imatinib?

- 1- Inhibits guanylate cyclase
- 2- Inhibits HER
- 3- Inhibits MAP kinase
- 4- Inhibits p53
- 5- Inhibits tyrosine kinase

Answer & Comments

Answer: 5- Inhibits tyrosine kinase

Imatinib is an inhibitor of tyrosine kinase and is used in the treatment of conditions such as chronic myelocytic leukaemia (CML) and gastrointestinal stromal tumours (GIST).

It inhibits TK on abl proto-oncogene, c-kit and the PDGF-R.

In CML, the Philadelphia chromosome leads to a fusion protein of abl with bcr (breakpoint cluster region), termed bcr-abl. As this is now a continuously active tyrosine kinase, imatinib is used to decrease bcr-abl activity.



[Q: 2630] OnExamination 2012 - Haematology

A 62-year-old male is diagnosed with chronic myeloid leukaemia and his investigations

show that both Philadelphia chromosome and bcr/abl gene is present.

What is the significance of the presence of the bcr/abl gene?

- 1- Acts on stem cell line DNA
- 2- Blocks apoptosis
- 3- Codes for the production of a tyrosine kinase in the leukaemic cells
- 4- Increases expression of granulocyte colony stimulating factor receptors on the cell membrane.
- 5- Increases production of granulocyte colony stimulating factor

Answer & Comments

Answer: 3- Codes for the production of a tyrosine kinase in the leukaemic cells

The product of the bcr/abl gene that is seen in 97% cases of chronic myeloid leukaemia is a constitutively active tyrosine kinase; this is responsible for the leukaemic process.



[Q: 2631] OnExamination 2012 - Haematology

A 29-year-old woman presents with acute right sided weakness.

She has one child aged 4 years and had two spontaneous abortions in the past. After the birth of her child she developed a DVT and required three months' anticoagulation with warfarin.

Examination revealed a right hemiparesis. A CT head scan showed a left middle cerebral artery territory infarct.

What is the most likely finding on echocardiography?

- 1- Atrial septal defect
- 2- Bicuspid aortic valve
- 3- Left atrial myxoma
- 4- Normal appearances

5- Ventricular septal defect

Answer & Comments

Answer: 4- Normal appearances

This patient has a prothrombotic tendency suggestive of the lupus anticoagulant with recurrent abortions, previous deep vein thrombosis (DVT) and now she has developed a right hemiparesis.

This has occurred off warfarin and it is highly unlikely to be due to any right to left transference of clot.

It is more likely to be due to spontaneous infarct related to the thrombophilia and her heart is likely to be normal.



[Q: 2632] OnExamination 2012 - Haematology

Which of the following statements is true of sickle cell disease?

- 1- A painful shoulder joint will respond to intra-articular corticosteroid injection
- 2- Oral iron supplements are required
- 3- Symptoms of anaemia are usually limiting when Hb equals 8 g/dl
- 4- There is often an inability to concentrate urine
- 5- The spleen is frequently enlarged

Answer & Comments

Answer: 4- There is often an inability to concentrate urine

A urine concentrating defect is quite common in sickle cell anemia, has its onset in early childhood, and may be reversible with prevention of sickle crises. The inner medulla is hypoxic, hypertonic and acidotic and therefore predisposes to sickling of red blood cells, which results in vasoocclusion and reduction in renal medullary blood flow. Associated haematuria increases venous

pressure, which can worsen renal medulla ischaemia. Clinical manifestations depend of the predominant site of tubule involvement: proximal tubule dysfunction impairs urinary concentration, whilst more distal dysfunction impairs potassium excretion.

There is a tendency to iron overload in sickle cell disease and therefore iron therapy is not usually indicated. The spleen is decreased in size after six months of age, due to repeated episodes of venoocclusion and infarction, and patients often have functional hyposplenism and are recommended to take daily penicillin. The anaemia associated with sickle cell disease is usually only symptomatic below 7g/dl, as oxygen is released more readily from erythrocytes. Intra-articular steroids have been associated with a sickle cell crisis, the mechanism of which is not fully understood, but they should be avoided.



[Q: 2633] OnExamination 2012 - Haematology

A 45-year-old Chinese man is found incidentally to have a severely hypochromic and microcytic blood picture, with Hb 11.2g/dl. He is asymptomatic.

Which of the following is the most discriminatory investigation?

- 1- Barium enema
- 2- Bone marrow biopsy
- 3- Gastroscopy
- 4- Haemoglobin electrophoresis
- 5- Ham test

Answer & Comments

Answer: 4- Haemoglobin electrophoresis

Thalassaemia trait is a common, usually asymptomatic abnormality.

Red cells are hypochromic and microcytic, but iron and ferritin stores are normal.

Haemoglobin electrophoresis shows raised HbA2 (greater than 3.5%) and raised HbF (normally consisting predominantly of HbA with trace of HbF and HbA2).



[Q: 2634] OnExamination 2012 - Haematology

What is the mode of inheritance of hereditary non-polyposis colorectal cancer (Lynch syndrome)?

- 1- Autosomal dominant
- 2- Autosomal recessive
- 3- Co-dominance
- 4- Incomplete penetrance
- 5- X linked

Answer & Comments

Answer: 1- Autosomal dominant

Lynch syndrome (HNPCC or hereditary non-polyposis colorectal cancer) is an autosomal dominant genetic condition which has a high risk of colon cancer as well as other cancers including:

Endometrial

Ovary

Stomach

Small intestine

Hepatobiliary tract

Upper urinary tract

Brain and

Skin.

The increased risk for these cancers is due to inherited mutations that impair DNA mismatch repair.



[Q: 2635] OnExamination 2012 - Haematology

Which non-gastrointestinal tumour is

frequently associated with Lynch syndrome?

- 1- Endometrial
- 2- Lung
- 3- Prostate
- 4- Renal
- 5- Sarcoma

Answer & Comments

Answer: 1- Endometrial

Lynch syndrome (HNPCC or hereditary nonpolyposis colorectal cancer) is an autosomal dominant genetic condition which has a high risk of colon cancer as well as other cancers including

Endometrial

Ovary

Stomach

Small intestine

Hepatobiliary tract

Upper urinary tract

Brain and

Skin.

The increased risk for these cancers is due to inherited mutations that impair DNA mismatch repair.



[Q: 2636] OnExamination 2012 - Haematology

A 25-year-old woman presents with oligomenorrhoea. On examination she has a large pelvic mass and is referred for further investigation.

Prior to a planned biopsy of her pelvic mass, she complains of a dry cough. A subsequent chest x ray reveals multiple rounded opacities throughout both lung fields.

What is the best test for monitoring her condition after optimal treatment?

- 1- Alpha-fetoprotein (AFP)
- 2- CA-125
- 3- None
- 4- Regular abdominal ultrasound
- 5- Regular pelvic examination

Answer & Comments

Answer: 1- Alpha-fetoprotein (AFP)

Patients with germ cell tumours are usually young and present in a variety of ways. The diagnosis is usually made on biopsy in the case of ovarian tumours and treatment usually consists of surgery followed by chemotherapy (BEP).

Markers such as AFP, β -human chorionic gonadotropin (HCG) and lactate dehydrogenase (LDH) may be raised but the most sensitive marker used for monitoring treatment efficacy and risk of relapse is AFP.



[Q: 2637] OnExamination 2012 - Haematology

What is the best predictive factor for local recurrence of breast cancer after surgery, chemotherapy and radiotherapy?

- 1- Age
- 2- HER-2/neu status
- 3- Lymph node status
- 4- Oestrogen receptor status
- 5- Tumour grade

Answer & Comments

Answer: 1- Age

Patients below the age of 40 are significantly more likely to develop local recurrence of a breast cancer than those aged 41+.

The exact mechanism for this remains unknown, however it was the most predictive of all factors in the trial.

Patients aged 41-50 are also at a high risk of recurrence (although not as high as under 40) and usually receive a boost of radiotherapy to the tumour bed if they have a grade 3 tumour, positive vascular invasion or lymph node disease.



[Q: 2638] OnExamination 2012 - Haematology

What is the mechanism by which patients with testicular cancer develop gynaecomastia?

- 1- Altered fat metabolism
- 2- Metastatic disease to breast tissue
- 3- Paraneoplastic phenomenon
- 4- Raised oestrogen levels
- 5- Raised testosterone levels

Answer & Comments

Answer: 4- Raised oestrogen levels

High levels of β -HCG in patients with testicular cancers cause increased production of oestrogen which in turn stimulates hypertrophy of breast tissue. This usually resolves with treatment of the underlying cancer.

Rarely gynaecomastia can be the trigger by which a young man will seek medical attention; testicular examination should therefore be done in every case.



[Q: 2639] OnExamination 2012 - Haematology

What is the approximate five year survival for a Dukes' C adenocarcinoma of the colon?

- 1- 10%
- 2- 25%
- 3- 50%
- 4- 80%
- 5- 95%

Answer & Comments

Answer: 3- 50%

The Dukes' staging system has now largely been replaced with the TNM system, however it is still used and referred to in follow up of patients diagnosed and treated recently.

The Dukes' staging system has been proven to correlate well with a patient's chance of survival, a Dukes' C colon cancer has a 40-50% chance of cure at five years.

It is classified as following

Dukes' A: Invasion into but not through the bowel wall

Dukes' B: Invasion through the bowel wall but not involving lymph nodes

Dukes' C: Involvement of lymph nodes

Dukes' D: Widespread metastases.



[Q: 2640] OnExamination 2012 - Haematology

Which of the following tumour markers are used to assess disease activity in metastatic breast cancer?

- 1- AFP
- 2- CA125
- 3- CA19-9
- 4- CA15-3
- 5- PSA

Answer & Comments

Answer: 4- CA15-3

While all the markers given above are used to monitor disease activity, only CA15-3 is used routinely to monitor metastatic breast cancer.

CA125 is monitored in ovarian cancer

CA19-9 in pancreatic cancer

AFP in teratoma and liver cancer with

PSA measured in prostate cancer.



[Q: 2641] OnExamination 2012 - Haematology

In an asymptomatic woman, which of the following conveys the greatest risk of developing breast cancer?

- 1- Early menarche
- 2- Late menopause
- 3- Oral contraceptive use
- 4- Previous fibroadenoma excised aged 25
- 5- Two first degree relatives with breast cancer

Answer & Comments

Answer: 5- Two first degree relatives with breast cancer

Early menarche and late menopause both confer an additional risk of developing breast cancer thought to be due to increased hormone exposure throughout life.

Oral contraceptive use is also associated with a slight increase in risk of developing breast and also endometrial cancer.

A previous fibroadenoma does not increase the patient's risk at all.



[Q: 2642] OnExamination 2012 - Haematology

A 45-year-old woman presents to the oncology clinic with a screen detected left sided breast lump.

The final histology following excision is a grade 3, 14 mm invasive carcinoma with clear vascular invasion.

Oestrogen and progesterone receptor status is positive, HER-2/neu overexpression is also strongly positive.

The patient is considered for adjuvant treatment with Herceptin (trastuzumab).

What is the best test for monitoring the patient while she is receiving Herceptin (trastuzumab)?

- 1- Monthly CA-15.3 measurement
- 2- Regular clinical examination
- 3- Three monthly ECG
- 4- Three monthly echocardiogram
- 5- Three monthly mammogram

Answer & Comments

Answer: 4- Three monthly echocardiogram

Herceptin has revolutionised the treatment of Her-2/neu positive patients, however it has been linked with the development of moderate to severe heart failure in a very small minority of patients.

Herceptin appears to be directly toxic to the cardiac muscle itself with relative sparing of the electrical conductivity of the heart.

As such regular echocardiograms are the best test to assess treatment safety, a reduction of greater than 10% in ejection fraction indicating the need to stop treatment.

BSE Statement on Trastuzumab (Herceptin) Therapy



[Q: 2643] OnExamination 2012 - Haematology

A 65-year-old woman is seen in the oncology clinic following a diagnosis of a grade 3, 14 mm invasive breast cancer with no vascular invasion.

0 of 4 axillary lymph nodes were involved and excision margins were complete.

Staining for oestrogen receptors and progesterone receptors is strongly positive, HER-2 staining is negative.

She is considered for adjuvant chemotherapy and hormone treatments.

Which of the following endocrine agents would be prescribed for this patient?

- 1- Anastrozole
- 2- Exemestane
- 3- Fulvestrant
- 4- Letrozole
- 5- Tamoxifen

Answer & Comments

Answer: 1- Anastrozole

NICE has approved the use of anastrozole for first line adjuvant endocrine treatment of primary breast cancer. It works as an aromatase inhibitor preventing the peripheral conversion of oestrogen (which is the primary source in post-menopausal women).

Fulvestrant is a new pure anti-oestrogen agent which appears to be as effective as anastrozole; it is given by sub-cutaneous injection once every three weeks.

Fulvestrant is not currently given first line in post-menopausal women but this may change in the near future.

See NICE guidance for further details and trials data



[Q: 2644] OnExamination 2012 - Haematology

Which of the following is most commonly associated with prolonged QT interval?

- 1- Hypercalcaemia
- 2- Hyperthyroidism
- 3- Hypocalcaemia
- 4- Hypomagnesaemia
- 5- Hyponatraemia

Answer & Comments

Answer: 3- Hypocalcaemia

Hypocalcaemia causes prolonged QT interval due to an increase in ST segment duration.

Other causes of prolonged QT interval are

Hypothermia

Hypothyroidism

Drugs (amiodarone)

Acute myocarditis

Cerebral injury

Mitral valve prolapse and

Hypertrophic obstructive cardiomyopathy (HOCM).

Hypokalemia



[Q: 2645] OnExamination 2012 - Haematology

A 45-year-old Afro-Caribbean obese woman presented with unexplained confusion, shortness of breath, cold and pain in her fingers and toes.

She is usually fit and well and had only a transient gastrointestinal upset few weeks ago, after which she has felt increasingly tired with worsening confusion. She had no regular medications, did not smoke or use excessive amounts of alcohol. She has returned from a two day trip to Malaysia yesterday.

On examination she was mildly confused, looked generally pale with cold peripheries and very pale nail folds. She was afebrile, mildly tachycardic and tachypnoeic with normal heart sounds and bibasal crepitations on chest auscultation. She had no focal neurological deficit or cranial nerve palsy but during examination she developed a one minute seizure involving the right side of her body.

Her chest x ray showed bilateral peripheral patchy parenchymal opacities and routine bloods showed:

Sodium 137 mmol/l (137-144)

Potassium 5.8 mmol/l (3.5-4.9)

Creatinine 110 µmol/l (60-110)

Urea 7.1mmol/l (2.5-7.5)

Albumin 36 g/l (37-49)

Total bilirubin 28 µmol/l (1-22)

Alk.phosphatase 77 IU/L(30-110)

ALT 14 IU/L(5-40)

LDH 450 IU/L(672)

CRP 8 mg/l (<5)

Hb 7.9 g/dl(13.0-18.0)

Haematocrit 25%

WBC $11.6 \times 10^9/L$ (4-11)

Platelets $20 \times 10^9/L$ (150-400)

MCV 93 fl(80-96)

Prothrombin time 14.2 seconds(11.5-15.5)

INR 1.1<1.4

APTT 21.2 seconds(30-40)

Peripheral smear shows fragmented schistocytes and an elevated reticulocyte count.

What is the most likely cause of this patient's neurological presentation?

- 1- Cerebral malaria
- 2- Cerebral venous sinuses thrombosis
- 3- Haemolytic uraemic syndrome
- 4- Intracranial haemorrhage due to essential thrombocytopenia
- 5- Thrombotic thrombocytopenic purpura (TTP)

Answer & Comments

Answer: 5- Thrombotic thrombocytopenic purpura (TTP)

TTP is a clinical diagnosis and potential diagnosis in any patient with anaemia and thrombocytopenia - 95% of cases are fatal if left untreated.

Symptoms are usually non-specific. Renal and neurological dysfunctions are the main complications.

Examination of the peripheral smear is critical and shows evidence of microangiopathic haemolytic anaemia with fragmented RBCs (schistocytes) and thrombocytopenia. An urgent haematological consultation is recommended for suspected cases. Plasma exchange therapy is the mainstay of treatment.

A pentad of clinical features which characterise the disease are:

Microangiopathic haemolytic anaemia. The peripheral smear shows microangiopathic haemolysis as evidenced by the presence of schistocytes

Thrombocytopenia with purpura

Acute renal insufficiency (usually less marked in TTP than in haemolytic uraemic syndrome)

Neurological abnormalities (usually more marked in TTP than in haemolytic uraemic syndrome) Neurological manifestations are present in most patients, and range from confusion and severe headache, to focal neurological abnormalities, seizures and coma

Fever.

Not all of the above may be present.

Other features are:

Purpura, ecchymosis, and menorrhagia due to thrombocytopenia may also be seen in 20% of cases

Peripheral digit ischaemic syndrome

Nonocclusive mesenteric ischaemia

Adult respiratory distress syndrome (ARDS).

Additional laboratory findings:

The reticulocyte count is generally elevated

Lactate dehydrogenase and bilirubin are often elevated as markers of haemolysis

Direct Coombs' test should be negative to rule out autoimmune haemolytic anaemia

Assays have been developed to measure von Willebrand factor cleaving enzyme (ADAMTS-13) activity. ADAMTS-13 activity can be low, and inhibitors to its activity can often be demonstrated in patients with TTP.

Cerebral malaria is an important differential diagnosis in travellers to the endemic areas and who present with decreased Glasgow coma score (GCS) and history of fevers, but the incubation period is usually seven to 14 days. In this case, the patient developed symptoms gradually and prior to her travel.

A history of fevers would strongly suggest the possibility of malaria although fever may also be present in TTP, sepsis, disseminated intravascular coagulation (DIC) and all can give a similar laboratory picture. TTP in this clinical scenario would be the first on the differential list.

Cerebral venous sinuses thrombosis clinically may present as headache, focal neurological deficit, seizures and decreased level of GCS but pathogenesis is usually associated with prothrombotic conditions (with thrombocytosis being more likely rather than thrombocytopenia).

The pathogenesis of neurological disturbances in TTP is formation of microthrombi in microcirculation.

Haemolytic uraemic syndrome is the main differential in thrombocytopenia and haemolytic anaemia but this presents with more marked renal failure and neurological complications occur less frequently.

This is clearly not essential thrombocytopenia, which, as the definition says, affects only megakaryocytic lineage. In this clinical scenario, there is laboratory evidence of haemolytic anaemia.

Reference:

BMJ Best Practice. Thrombotic thrombocytopenic purpura.

Chang JC, Kathula SK. Various clinical manifestations in patients with thrombotic microangiopathy. *J Investig Med.* 2002 May;50(3):201-6.



[Q: 2646] OnExamination 2012 - Haematology

The mother of a 16-year-old boy with HbSC comes to your practice and asks for advice with regard to the vaccination requirements of her son.

He has had all of his childhood immunisations on schedule.

- 1- Usual childhood immunisation schedule is all that is required
- 2- Usual childhood immunisations and meningococcal C vaccine
- 3- Usual childhood immunisations and yearly influenza vaccine
- 4- Usual childhood immunisations, yearly influenza vaccine, five yearly Pneumovax vaccine
- 5- Usual childhood immunisations, five yearly Pneumovax vaccine and meningococcal C vaccine

Answer & Comments

Answer: 4- Usual childhood immunisations, yearly influenza vaccine, five yearly Pneumovax vaccine

Vaccinations should usually be done at general practice.

All adults who are hyposplenic, including patients with sickle cell disease need:

Yearly influenza vaccine

Pneumococcal C vaccine, (adults and children over 2 years) repeated every five years

Haemophilus influenzae type b; if not already given as part of childhood immunisation

Conjugated meningococcal C vaccine; if not already given as part of childhood immunisation

Meningococcal ACWY vaccine; if travelling to areas with high risk of meningitis.

Option A is incorrect. Patients with sickle cell disease are hyposplenic, and have additional lifelong requirements.

Option B is incorrect. Meningococcal C vaccine is a part of primary immunisation schedule which this young boy should have had already. Had this young boy not been up to date with his childhood immunisation schedule, then he should have a single dose.

Option C is incorrect. Although patients with sickle cell disease do need the yearly influenza vaccination, they also need five yearly Pneumovax.

Option D is correct. This young boy is up to date with all his childhood immunisations; therefore he should need yearly influenza and five yearly Pneumovax vaccinations. It is worth mentioning that all hyposplenic patients should be offered meningococcal ACWY vaccine if travelling to areas at high risk of meningitis.

Option E is incorrect. This young boy is up to date with his immunisation and therefore should not need additional meningococcal C vaccination. He does however need yearly influenza vaccination and five yearly Pneumovax.



[Q: 2647] OnExamination 2012 - Haematology

A 62-year-old gentleman is being investigated for normochromic, normocytic anaemia. He is diagnosed with diabetes mellitus type II and essential hypertension.

His haemoglobin is stable at 9.5 g/dL, his creatinine clearance is calculated at 45 ml/min, ferritin at 50ug/L and his serum

erythropoietin level comes back at 8 (normal range: 4-24 mU/ml).

Which of the following is the most appropriate management?

- 1- Commencement of subcutaneous darbopoietin
- 2- Intravenous iron supplementation
- 3- Check haemoglobin at 6 monthly intervals
- 4- Transfusion aiming for Hb of 10-12 g/dL
- 5- Transfusion aiming for Hb of 12-14 g/dL

Answer & Comments

Answer: 2- Intravenous iron supplementation

This patient has CKD stage 3A (borderline 3B). Renal-related anaemia can start to develop at this stage as alteration in erythropoietin production occurs. It is worsened by reduced dietary intake of iron due to anorexia, impaired intestinal absorption of iron, toxic effect of uraemia on erythroid precursors and reduced red blood cell survival.

It is imperative that renal patients avoid repeated blood transfusion, unless in extremis, so that future renal transplantation will not be precluded by allo-sensitisation.

Before initiation of recombinant erythropoiesis-stimulating agents the patient should be iron replete. The serum ferritin and transferrin saturation should be checked, as most patients will be iron deficient. Targets for treatment are:

- Haemoglobin 10.5-12.5g/dL
- Ferritin: >100ug/L in pre-dialysis and peritoneal dialysis patients, >200ug/L in haemodialysis patients
- Transferrin saturation >20%

This patient should also be referred to a nephrologist, as early assessment of the causes of his renal impairment is beneficial. Patients with CKD stage 3A, who are non-proteinuric, have a low risk of progression and

can usually be managed in the community following initial assessment by a nephrologist. Those with proteinuria are usually managed in secondary care, as the protein is directly toxic to the tubules and this typically results in progression of renal impairment.



[Q: 2648] OnExamination 2012 - Haematology

Which one of the following is a common feature in the presentation of myeloma?

- 1- Hypercalcaemia
- 2- Hyperglycaemia
- 3- Hypocalcaemia
- 4- Hyponatraemia
- 5- Polycythaemia

Answer & Comments

Answer: 1- Hypercalcaemia

The following are presenting clinical features of multiple myeloma:

Older adults - median age 60 years; male more than female

Anaemia

Bone pain - most common in the back or ribs; may present as a pathologic fracture following minimal trauma, especially of the femoral neck

Infection - commonly with encapsulated organisms such as *Streptococcus pneumoniae*, *Haemophilus influenzae*; due to suppression of antibody production and neutropenia

Hypercalcaemia - nausea, fatigue, confusion, polyuria, constipation

Weight loss is common

Hyperviscosity.

Hypercalcaemia is caused by osteoclast activating factors.

British Committee for Standards in Haematology.

<http://www.bcsghguidelines.com>

www.gpnotebook.com



[Q: 2649] OnExamination 2012 - Haematology

The most common error in transfusion according to the SHOT (serious hazards of transfusion) analysis is which of the following?

- 1- Cross match error in the blood bank laboratory
- 2- Inability to detect antibodies in the blood bank laboratory
- 3- Incorrect indication for transfusion
- 4- Incorrect storage temperature for blood products.
- 5- Wrong identification/ mislabelling of patient or sample

Answer & Comments

Answer: 5- Wrong identification/ mislabelling of patient or sample

Mislabelling of samples, requests or wrongly identifying recipients are the commonest transfusion errors.

This was borne out in the SHOT study which analysed transfusion errors and 'near misses' in a UK wide audit.

Other errors such as cross match error, incorrect storage and transfusion reaction due to an antibody not detected do occur but are rare.

Reference:

L M Williamson, S Lowe, E M Love, H Cohen, K Soldan, D B L McClelland, P Skacel, A J Barbara; Serious hazards of transfusion (SHOT) initiative: analysis of the first two annual reports *BMJ* 1999;319:16



[Q: 2650] OnExamination 2012 - Haematology

Which blood used for an exchange transfusion in a neonate should fulfil these criteria?

- 1- Any blood less than five days old
- 2- Any plasma reduced whole blood in CPD
- 3- Plasma reduced whole blood in CPD which is irradiated
- 4- Plasma reduced whole blood in CPD less than five days old and irradiated
- 5- Plasma reduced whole blood in CPD less than five days old, irradiated and Rh group should be same as the neonate

Answer & Comments

Answer: 4- Plasma reduced whole blood in CPD less than five days old and irradiated

An exchange transfusion requires blood which is plasma reduced whole blood, irradiated and less than five days old (hence option D and not A, B or C).

The Rh group should be compatible with the mother, not the neonate, to avoid haemolytic transfusion reaction in the neonate due to maternal Rh antibodies (hence not option E).



[Q: 2651] OnExamination 2012 - Haematology

A 73-year-old man with extensive bony metastases from carcinoma of the prostate is brought to the Emergency department by his family.

They are concerned as his pain has worsened over the past few days, but increasing his morphine has only resulted in worsening drowsiness and confusion. Currently he is managed with maximal paracetamol and 120 mg of MST BD.

Investigations show:

Haemoglobin 14.1 g/dl(13.5-17.7)

White cell count $7.2 \times 10^9/L$ (4-11)

Platelets $193 \times 10^9/L$ (150-400)

Sodium 140 mmol/l (135-146)

Potassium 4.3 mmol/l (3.5-5)

Creatinine 152 $\mu\text{mol/l}$ (79-118)

Which of the following is the most appropriate way to manage his pain relief?

- 1- Change him to a three day fentanyl patch
- 2- Reduce his MST to 80 mg BD
- 3- Reduce his MST to 100 mg BD and add naproxen
- 4- Start a subcutaneous morphine syringe driver
- 5- Stop his MST and titrate oramorph to his pain

Answer & Comments

Answer: 3- Reduce his MST to 100 mg BD and add naproxen

The key to management of bony metastases is a multimodal approach to managing pain, which involves opiates, paracetamol and an appropriate non-steroidal anti-inflammatory agent. This patient is on both morphine (MST - a slow release preparation of morphine sulphate) and paracetamol.

In this case he is too drowsy because of his morphine, but it is not appropriate to stop it and titrate oramorph when he complains of pain. It is much more appropriate to engineer a small dose reduction and add naproxen. Whilst his creatinine is abnormal, at this stage of his disease, relieving his pain is more important than concerns about worsening his renal function.

We are given no indication that he is unable to eat and drink, so a subcutaneous morphine syringe driver is not appropriate at this stage.



[Q: 2652] OnExamination 2012 - Haematology

A 45-year-old male is being treated with

imatinib for chronic myeloid leukaemia (CML).

Which of the following the class of agent is imatinib?

- 1- Angiogenesis inhibitor
- 2- Epidermal growth factor inhibitor
- 3- Interferon
- 4- Proteasome inhibitor
- 5- Signal transductase inhibitor

Answer & Comments

Answer: 5- Signal transductase inhibitor

Imatinib is a tyrosine kinase inhibitor which blocks the bcr/abl protein from inducing cell growth.

NICE recommend that imatinib should be used to treat people in the accelerated or blast crisis phase of CML.



[Q: 2653] OnExamination 2012 - Haematology

A young woman presents with pallor, tiredness and fatigue.

Her full blood count is reported as typical of acute lymphoblastic leukaemia.

Which of the following is associated with the worst prognosis in ALL?

- 1- Female sex
- 2- Philadelphia chromosome present
- 3- Pre-B phenotype
- 4- Presentation in childhood
- 5- WCC of $21 \times 10^9/L$ at diagnosis

Answer & Comments

Answer: 2- Philadelphia chromosome present

In acute lymphoblastic leukaemia:

Good prognostic factors

FAB L1 type

Common ALL
 Pre-B phenotype
 Low initial WBC
 Poor prognostic factors
 FAB L3 type
 B, T cell type
 Philadelphia translocation, t(9;22)
 Increasing age at diagnosis
 Male sex
 CNS involvement
 High initial WBC (e.g. > 100).



[Q: 2654] OnExamination 2012 - Haematology

A 28-year-old man presented with recurrent nose bleeds and iron deficiency anaemia.

A chest x ray found a shadow over the right lung base and auscultation in this area revealed a bruit.

Which of the following is the most likely diagnosis?

- 1- Ehlers-Danlos syndrome
- 2- Hereditary haemorrhagic telangiectasia
- 3- Idiopathic thrombocytopenic purpura
- 4- von Willebrand's disease
- 5- Wegener's granulomatosis

Answer & Comments

Answer: 2- Hereditary haemorrhagic telangiectasia

This is hereditary haemorrhagic telangiectasia (Osler-Weber-Rendu syndrome) characterised by bleeding from telangiectasia on mucous membranes such as the nose, mouth and gastrointestinal tract.

Clinical examination reveals telangiectasia on the skin.

Arteriovenous malformation may be seen in the lung (as in this case) or brain.

Hereditary Hemorrhagic Telangiectasia Foundation International



[Q: 2655] OnExamination 2012 - Haematology

A 28-year-old man presented with recurrent nose bleeds and iron deficiency anaemia.

A chest x ray found a shadow over the right lung base and auscultation in this area revealed a bruit.

Which of the following is the most likely diagnosis?

- 1- Ehlers-Danlos syndrome
- 2- Hereditary haemorrhagic telangiectasia
- 3- Idiopathic thrombocytopenic purpura
- 4- von Willebrand's disease
- 5- Wegener's granulomatosis

Answer & Comments

Answer: 2- Hereditary haemorrhagic telangiectasia

This is hereditary haemorrhagic telangiectasia (Osler-Weber-Rendu syndrome) characterised by bleeding from telangiectasia on mucous membranes such as the nose, mouth and gastrointestinal tract.

Clinical examination reveals telangiectasia on the skin.

Arteriovenous malformation may be seen in the lung (as in this case) or brain.

Hereditary Hemorrhagic Telangiectasia Foundation International



[Q: 2656] OnExamination 2012 - Haematology

A 26-year-old woman presented at 35 weeks of pregnancy with profuse vaginal bleeding. She had suffered two previous miscarriages.

She had a pulse of 95 beats per minute, blood pressure of 110/84 mmHg and no fetal heart sounds were audible.

Investigations revealed:

Haemoglobin 9.8 g/dl 11.5 - 16.5 g/dL

Platelets $66 \times 10^9/L$ 150 - $400 \times 10^9/L$

Prothrombin time 21 sec (11.5-15.5)

APTT 52 sec (30-40)

Fibrinogen 0.5 g/l (2-4)

What is the most appropriate next step in management?

- 1- Antithrombin III infusion
- 2- Fibrinogen replacement infusion (cryoprecipitate)
- 3- Intravenous heparin
- 4- Platelet transfusion
- 5- Transfusion of two units group O rhesus D negative blood

Answer & Comments

Answer: 2- Fibrinogen replacement infusion (cryoprecipitate)

The clinical picture is disseminated intravascular coagulation.

When bleeding is the major problem, the aim is to maintain the prothrombin and activated thromboplastin time at a ratio of 1.5 times of the control and the fibrinogen level above 1 g/l.

Platelet transfusion is recommended if the count is less than $50 \times 10^9/L$.

Anaemia is not very severe so in this case fibrinogen replacement would be the appropriate first choice with blood transfusion an addition if bleeding continues and patient develops hypovolaemic shock.



[Q: 2657] OnExamination 2012 - Haematology

A 65-year-old female is receiving treatment for colon cancer with a combination chemotherapy regime that includes irinotecan.

Which of the following best describes the action of irinotecan?

- 1- Alkylating agent
- 2- DNA antimetabolites
- 3- Inhibition of protein synthesis
- 4- RNA/DNA antimetabolites
- 5- Topoisomerase inhibitor

Answer & Comments

Answer: 5- Topoisomerase inhibitor

Irinotecan is a chemotherapy agent that is a topoisomerase 1 inhibitor. Chemically, it is a semisynthetic analogue of the natural alkaloid Camptothecin.

Its main use is in colon cancer, particularly in combination with other chemotherapy agents. This includes the regimen FOLFIRI which consists of infusional 5-fluorouracil, leucovorin, and irinotecan.



[Q: 2658] OnExamination 2012 - Haematology

A 26-year-old man presents with dark urine, especially in the early morning. Further investigations show that he has haemoglobinuria and haemolytic anaemia.

A diagnosis of paroxysmal nocturnal hemoglobinuria (PNH) is made.

What is the likely mechanism underlying this condition?

- 1- Aberrant fusion of two genes
- 2- Impaired protein degradation
- 3- Over-expression of cellular oncogene
- 4- Post-translational modification

5- Telomere shortening

Answer & Comments

Answer: 4- Post-translational modification

Post-translational modification by the GPI glycolipid anchor is essential for the surface expression of many membrane proteins.

Defect of GPI biosynthesis due to somatic mutation in the haematopoietic stem cell is the basis for an acquired genetic disease, paroxysmal nocturnal haemoglobinuria.

The other mechanisms are associated with various other diseases.



[Q: 2659] OnExamination 2012 - Haematology

A 31-year-old male is receiving treatment for testicular carcinoma with cisplatin based chemotherapy.

Which of the following best describes the action of cisplatin?

- 1- Alkylating agent
- 2- DNA antimetabolites
- 3- Inhibition of protein synthesis
- 4- RNA/DNA antimetabolites
- 5- Topoisomerase inhibitor

Answer & Comments

Answer: 1- Alkylating agent

Cisplatin is a platinum based chemotherapy used in the treatment of testicular tumours, ovarian tumours and lymphomas. It functions through crosslinking DNA preventing the division required for rapid mitosis. Although it does not have an alkyl group, it is classed as an alkylating agent.



[Q: 2660] OnExamination 2012 - Haematology

A 29-year-old female student nurse presents

with a discrete thyroid swelling.

An isotope scan reveals it to be a "cold nodule". She has scattered local cervical lymphadenopathy.

What is the likely diagnosis?

- 1- Anaplastic carcinoma
- 2- Graves' disease
- 3- Medullary carcinoma
- 4- Papillary carcinoma
- 5- Subacute thyroiditis

Answer & Comments

Answer: 4- Papillary carcinoma

Papillary carcinoma makes up 75% of thyroid tumours and this patient's age (less than 45) puts her in a low risk group.

Usually these tumours present as "cold nodules" on isotope scanning.

These cancers may extend by intraglandular spread or local lymph node invasion. They are slow growing but may become more aggressive spreading locally or metastasising, especially to the lung.

Anaplastic carcinoma is very aggressive and more common in elderly subjects.

Subacute thyroiditis presents with moderate thyroid enlargement, fever, malaise and neck pain. The gland is tender and there may be signs of thyrotoxicosis.



[Q: 2661] OnExamination 2012 - Haematology

A 35-year-old lady with a history of two previous lower limb deep vein thromboses presents with a further DVT. She has a thrombophilia screen performed, which shows the presence of lupus anticoagulant.

What is the best course of action?

- 1- Aspirin
- 2- Aspirin and warfarin

- 3- Long term low molecular weight heparin
- 4- Warfarin for six months
- 5- Warfarin life long

Answer & Comments

Answer: 5- Warfarin life long

This patient has recurrent DVTs and has been shown to have the presence of the lupus anticoagulant.

In the circumstances, evidence would suggest that lifelong anticoagulation with warfarin is required maintaining an international normalised ratio (INR) above 2.5.



[Q: 2662] OnExamination 2012 - Haematology

A 17-year-old woman with non-Hodgkin's lymphoma underwent splenectomy for haemolytic anaemia. She understood that she had an enhanced risk of developing overwhelming pneumococcal sepsis and wished to know how long this risk would persist.

What is the duration of the risk?

- 1- Up to six months
- 2- Up to one year
- 3- Up to five years
- 4- Five to 10 years
- 5- More than 10 years

Answer & Comments

Answer: 5- More than 10 years

The risk is thought to persist lifelong, and lifelong penicillin prophylaxis is recommended.



[Q: 2663] OnExamination 2012 - Haematology

A 75-year-old male is admitted with tiredness and lethargy and is found to have an enlarged

right supraclavicular mass.

Past medical history reveals that he had developed acrocyanosis six months previously and two months ago had been admitted with a chest infection for which he was treated with co-amoxiclav.

Investigations reveal:

Blood film red cell auto-agglutination

Direct antiglobulin test positive

Cold agglutinin test positive.

What is the most likely diagnosis?

- 1- Bronchial carcinoma
- 2- Drug-induced haemolysis
- 3- Mycoplasma pneumoniae infection
- 4- Non-Hodgkin's lymphoma (NHL)
- 5- Paroxysmal cold haemoglobinuria (PCH)

Answer & Comments

Answer: 4- Non-Hodgkin's lymphoma (NHL)

The results are consistent with an autoimmune haemolytic screen caused by a cold antibody. Drug induced haemolysis does not give these results.

Bronchial Ca can give rise to an autoimmune haemolytic process but the antibody is usually warm - you do not get red cell agglutination or a positive cold agglutinin test.

PCH is a rare syndrome of acute intravascular haemolysis after exposure to cold caused by the Donath-Landsteiner antibody. It typically follows a viral illness or syphilis and is usually self limiting.

The results and clinical description of acrocyanosis are consistent with a cold auto antibody (cold autoimmune haemolytic anaemia).

The antibody attaches to the RBCs in the peripheral circulation where the blood is cold, causing agglutination of the RBCs in the small vessels leading to the acrocyanosis.

It is an IgM Ab that can fix complement and cause both intra- and extravascular haemolysis. It can be a primary phenomenon (idiopathic cold haemagglutinin disease) or secondary to infection, for example, *Mycoplasma pneumoniae* or Epstein-Barr virus (EBV) or secondary to lymphoma.

The acrocyanosis developed before the chest infection, and in view of the lymphadenopathy, then NHL is the likely cause.



[Q: 2664] OnExamination 2012 - Haematology

Which one of the following types of thyroid cancer in a 45-year-old woman has the worst prognosis following optimal treatment?

- 1- Anaplastic cancer in a longstanding goitre
- 2- Follicular cancer with bone metastases
- 3- Medullary cancer as part of the MEN type II syndrome
- 4- Papillary cancer with cervical lymph node metastases
- 5- Thyroid lymphoma

Answer & Comments

Answer: 1- Anaplastic cancer in a longstanding goitre

Anaplastic carcinoma usually occurs in middle-aged and older patients with longstanding goitre.

The gland may suddenly increase in size producing pressure symptoms, dysphagia or vocal cord paralysis.

The tumour is resistant to therapy. Death from massive local extension usually occurs within three to 36 months.

Thyroid medullary carcinoma is the next most aggressive, especially so in multiple endocrine neoplasia (MEN) 2B subjects, but less so in 2A subjects.

Lymphoma may respond dramatically to irradiation.



[Q: 2665] OnExamination 2012 - Haematology

A 35-year-old male with a long history of ulcerative colitis is treated for an acute exacerbation which settles following an alteration of his medication.

Six weeks after discharge he is re-admitted with sepsis and his results show:

Haemoglobin 10.5 g/dl (13.0-18.0)

White cell count $2.0 \times 10^9/L$ (4-11)

Platelets $90 \times 10^9/L$ (150-400)

Which one of the following drugs is most likely to be the cause of his pancytopenia?

- 1- Azathioprine
- 2- Mesalazine
- 3- Metronidazole
- 4- Pamidronate
- 5- Prednisolone

Answer & Comments

Answer: 1- Azathioprine

Although both azathioprine and mesalazine cause pancytopenia, it is more commonly seen in patients undergoing azathioprine therapy.

Therefore this is 'most likely' to be the cause.



[Q: 2666] OnExamination 2012 - Haematology

A 19-year-old male with glucose-6-phosphate dehydrogenase deficiency wishes to travel to Africa.

Which one of the following should he be advised to avoid?

- 1- Ibuprofen
- 2- Loperamide
- 3- Mefloquine

- 4- Primaquine
5- Yellow fever vaccine

Answer & Comments

Answer: 4- Primaquine

G6PD deficiency is inherited in an X linked fashion and predisposes red blood cells to haemolysis.

Drugs recognised to predispose to acute haemolysis in G6PD deficiency include antimalarials such as primaquine, sulphonamides, nitrofurantoin and nalidixic acid.



[Q: 2667] OnExamination 2012 - Haematology

Which of the following genes encoding oncoproteins is associated with follicular lymphoma?

- 1- ATM
2- Bcl-2
3- BRCA-1
4- BRCA-2
5- p53

Answer & Comments

Answer: 2- Bcl-2

BRCA-1 and 2 are associated with early breast cancer and are involved in repair of double strand DNA breaks by homologous recombination.

ATM is inherited in a recessive fashion and is also involved in repair of DNA double strand breaks.

p53 is also referred to as the 'guardian of the genome' and is mutated in at least 50% of all breast cancers.



[Q: 2668] OnExamination 2012 - Haematology

In porphyria, which of the following is least likely to precipitate an acute attack?

- 1- Aspirin
2- Menstruation
3- Phenytoin
4- Starvation
5- Thiopentone

Answer & Comments

Answer: 1- Aspirin

Porphyria is a group of diseases characterised by excess production and excretion of porphyrins and their precursors.

They are caused by enzyme defects within the haem metabolic pathway.

Stress, infection, pregnancy, menstruation, starvation and certain drugs may precipitate acute attacks.

Definite precipitants include sulphonamides, barbiturates and phenytoin.

Drugs unsafe in porphyria



[Q: 2669] OnExamination 2012 - Haematology

In which of the following chemotherapeutic agents is the cumulative dose limited due to cardiotoxicity?

- 1- Cisplatin
2- Epirubicin
3- Etoposide
4- Herceptin (trastuzumab)
5- Methotrexate

Answer & Comments

Answer: 2- Epirubicin

Epirubicin and the other anthracycline chemotherapeutic agents are extremely potent but are limited by dose constraints.

Cumulative doses of over 900 mg/m² can lead to significant cardiac toxicity and heart failure.

Herceptin can cause direct myocardial damage and must be monitored with regular echocardiograms but it is not limited to a maximum lifetime dose.



[Q: 2670] OnExamination 2012 - Haematology

At which point in the cell cycle is the cell most resistant to radiation-induced apoptosis?

- 1- G0
- 2- G1
- 3- G2-M
- 4- Late S
- 5- S

Answer & Comments

Answer: 4- Late S

Cells exhibit different sensitivities to radiation in different phases of the cell cycle.

The cell is most radioresistant during late S-phase as there are double the number of chromosomes.

This forms the basis for dose fractionation in radiotherapy.



[Q: 2671] OnExamination 2012 - Haematology

What is the most effective bisphosphonate for use in reducing bone pain and preventing pathological fractures in patients with metastatic breast cancer?

- 1- Alendronic acid
- 2- Ibandronic acid
- 3- Olpadronate

- 4- Pamidronate
- 5- Zoledronic acid

Answer & Comments

Answer: 5- Zoledronic acid

Multiple randomised control studies have proven the efficacy of Zometa in treatment of bone metastasis from breast cancer.

It is commonly given for six months and if the patient responds then they can be switched to daily ibandronic acid to prevent repeat visits to hospital.

Zometa has a risk of osteonecrosis of the jaw which must be explained to patients before they are treated.



[Q: 2672] OnExamination 2012 - Haematology

A 20-year-old man is referred to the oncology clinic with a three week history of weight loss and a dry cough.

A chest x ray shows a large mediastinal mass which is subsequently biopsied showing a poorly differentiated carcinoma.

Which of the following tumour markers confers the best prognosis?

- 1- CA125
- 2- CA15.3
- 3- CA19.9
- 4- CEA
- 5- β -HCG

Answer & Comments

Answer: 5- β -HCG

A young man with a germ cell tumour (raised β -HCG) can expect a greater than 95% cure rate, especially with seminomas.

The patient should also have his alpha-fetoprotein level checked.

The other tumour markers listed here are raised in a variety of other cancer such as

CA 125 - Ovarian

CA 15.3 - Breast

CEA - Colorectal

CA 19.9 - Pancreatic

although they can be raised in other cancers and therefore are only useful in assessing response to treatment or monitoring for early evidence of relapse.



[Q: 2673] OnExamination 2012 - Haematology

Which of the following bacteria confer a decreased risk of developing an oesophageal adenocarcinoma?

- 1- Escherichia coli
- 2- Helicobacter pylori
- 3- Streptococcus bovis
- 4- Streptococcus pneumoniae
- 5- Streptococcus viridans

Answer & Comments

Answer: 2- Helicobacter pylori

Although the mechanism of action is unclear population studies have shown a lower incidence of oesophageal cancer in patients infected with H. pylori.

Reference:

Ye W, Held M, Lagergren J, et al. (2004). "Helicobacter pylori infection and gastric atrophy: risk of adenocarcinoma and squamous-cell carcinoma of the oesophagus and adenocarcinoma of the gastric cardia". *J. Natl. Cancer Inst.* 96 (5): 388-96. doi:10.1093/jnci/djh057



[Q: 2674] OnExamination 2012 - Haematology

Chemotherapy is often given after the cancer

has been completely removed by surgery rather than prior to surgery.

What is the reason for this?

- 1- Because chemotherapy prior to surgery is unproven clinically
- 2- Because the patient cannot tolerate chemotherapy before surgery
- 3- To ensure all the cancer cells are in the most sensitive cell cycle phase
- 4- To reduce the chance of chemotherapy resistance
- 5- To reduce the chance of micrometastasis

Answer & Comments

Answer: 5- To reduce the chance of micrometastasis

Adjuvant chemotherapy is commonly given in many cancers to reduce the risk of local or distant recurrence or metastasis.

This confers a survival benefit to the patient but is not without risks which should be explained to the patient during consenting. One of the most serious complications is neutropenic sepsis, which if untreated, could result in a patient's death.

Neoadjuvant chemotherapy is commonly given to downstage a cancer to make it either operable or to reduce the need for radical surgery. It is often followed by adjuvant chemotherapy or radiotherapy.



[Q: 2675] OnExamination 2012 - Haematology

Which of the following antiemetics is most useful following treatment with a platinum based chemotherapy?

- 1- Cyclizine
- 2- Dexamethasone
- 3- Metoclopramide
- 4- Ondansetron

5- Prochlorperazine

Answer & Comments

Answer: 4- Ondansetron

Post-chemotherapy nausea and vomiting are very important side effects to try and control because of the significant morbidity associated.

Not all chemotherapeutic agents are equally emetogenic; the platinum based chemotherapies are most likely to cause sickness while the antimetabolites such as 5-FU are usually well tolerated.

Treatment with a 5-HT₃ antagonist is particularly useful in platinum based chemotherapy where it also avoids the dystonic side effects noted with metoclopramide use.



[Q: 2676] OnExamination 2012 - Haematology

What is the best initial treatment for superior vena cava obstruction (SVCO)?

- 1- CT scan of the chest
- 2- High dose dexamethasone prescription
- 3- Referral for urgent radiotherapy to the superior vena cava
- 4- Referral for urgent stenting of the superior vena cava
- 5- Therapeutic enoxaparin administration

Answer & Comments

Answer: 2- High dose dexamethasone prescription

The patient is likely to need either stenting or radiotherapy to his SVC but initial treatment with steroids will reduce the surrounding oedema and improve venous return from the head and neck, improving symptoms and providing extra time to ensure the correct diagnosis and subsequent treatment.



[Q: 2677] OnExamination 2012 - Haematology

A 45-year-old woman presents with a screen detected left sided breast lump. This is confirmed on biopsy to be an invasive carcinoma, grade 2.

She undergoes a wide local excision and axillary node sampling with intra-operative radiotherapy to the tumour bed via MammoSite.

Post-operatively, what radiation precautions need to be taken with this patient?

- 1- Apply a zone of exclusion of 2 metres around the patient for 24 hours
- 2- Isolate in a lead lined side room for 24 hours
- 3- Isolate in a side room for 24 hours
- 4- None
- 5- The patient needs to wear a standard lead-lined apron for 24 hours

Answer & Comments

Answer: 4- None

Much confusion surrounds the use of radiotherapy, especially how patients are cared for on the ward.

It is critical to distinguish between whether the patient has had external beam radiotherapy, brachytherapy or use of an unsealed source.

External beam radiotherapy or use of targeted intraoperative radiotherapy does not render the patient radioactive.

Use of brachytherapy methods can involve insertion of radioactive seeds or beads which may require some radiation protection precautions depending on the site.

Use of an unsealed source, for example radioiodine treatment of thyroid cancer, has substantial need for precautions and patients

need to be isolated in a lead-lined side room, often for several days.



[Q: 2678] OnExamination 2012 - Haematology

A patient is seen in the oncology clinic with chronic myeloid leukaemia (CML).

What reciprocal chromosomal translocation is he likely to have?

- 1- 2 and 9
- 2- 8 and 14
- 3- 9 and 12
- 4- 9 and 22
- 5- 12 and 22

Answer & Comments

Answer: 4- 9 and 22

CML is associated with the Philadelphia chromosome, a reciprocal translocation of chromosomes 9 and 22 designated as t(9;22)(q34;q11).

This translocation fuses the bcr and abl genes creating the bcr-abl fusion protein which is constitutively active within the nucleus leading to increased cell proliferation and reduced DNA repair.



[Q: 2679] OnExamination 2012 - Haematology

A 65-year-old woman is diagnosed with primary breast cancer and is seen in the oncology clinic.

As part of her adjuvant treatment she is recommended to start treatment with anastrozole to prevent recurrence of her cancer.

A DEXA scan organised at the time of prescription reveals a T score of -2.6 although she has suffered no fragility fractures to date.

What is the next correct step in endocrine management of this patient?

- 1- Continue anastrozole
- 2- Continue anastrozole and prescribe a bisphosphonate.
- 3- Stop anastrozole
- 4- Stop anastrozole and convert to exemestane
- 5- Stop anastrozole and start tamoxifen

Answer & Comments

Answer: 2- Continue anastrozole and prescribe a bisphosphonate.

In a post-menopausal woman the endocrine treatment of choice for preventing recurrence of her primary breast cancer is an aromatase inhibitor.

Aromatase inhibitors work by causing severe oestrogen deprivation which increases the risk of osteoporosis. Aromatase inhibitors can be continued in a patient who has suffered no fragility fractures providing adequate measures are taken for bone protection, for example, prescribing a bisphosphonate.

In patients who suffer a fragility fracture tamoxifen must be considered as this does have a partial oestrogen agonist action on bone, reducing the risk of osteoporosis.



[Q: 2680] OnExamination 2012 - Haematology

A 70-year-old woman with known metastatic breast cancer to her lungs and bones presents with a symptomatic pleural effusion whilst taking anastrozole.

Subsequent drainage of this effusion reveals it to be malignant in nature.

The breast MDT suggests switching her endocrine agent to exemestane.

What is the mechanism of action of exemestane?

- 1- Competitive oestrogen receptor antagonist
- 2- Non-steroidal aromatase inhibitor

- 3- Pure oestrogen receptor antagonist
- 4- Steroidal aromatase inhibitor
- 5- Synthetic progesterone derivative

Answer & Comments

Answer: 4- Steroidal aromatase inhibitor

Anastrozole and letrozole are non-steroidal aromatase inhibitors.

Tamoxifen is a competitive oestrogen receptor antagonist with partial oestrogen agonist actions on bone.

Fulvestrant is a pure oestrogen receptor antagonist given via the subcutaneous route.

Megace is a synthetic progesterone derivative with anti-tumour properties.



[Q: 2681] OnExamination 2012 - Haematology

A 35-year-old woman is seen in the oncology clinic following a diagnosis of a grade 3, 14 mm invasive breast cancer with no vascular invasion.

0 of 4 axillary lymph nodes were involved and excision margins were complete.

She is considered for adjuvant chemotherapy and hormone treatments.

Which of the following endocrine agents would be prescribed for this patient?

- 1- Anastrozole
- 2- Exemestane
- 3- Fulvestrant
- 4- Letrozole
- 5- Tamoxifen

Answer & Comments

Answer: 5- Tamoxifen

NICE has approved the use of tamoxifen for first line endocrine treatment of an adjuvant breast cancer patient.

It is not appropriate to use an aromatase inhibitor as the patient's ovaries will be producing oestrogen, which could drive further cancer development.

Fulvestrant is a new pure anti-oestrogen agent which appears to be as effective as anastrozole. It is given by sub-cutaneous injection once every three weeks.

Fulvestrant is not currently given first line in post-menopausal women but this may change in the near future.

See NICE guidance for further details and trials data.



[Q: 2682] OnExamination 2012 - Haematology

A couple who are expecting their first child present to you for advice.

Both parents are known to be carriers of sickle cell trait HbS and want to know if their child will inherit the disease.

What do you tell them?

- 1- There is no chance their child will inherit the disease
- 2- There is a 25% chance their child will inherit the disease
- 3- There is a 50% chance their child will inherit the disease
- 4- There is a 75% chance their child will inherit the disease
- 5- There is a 100% chance their child will inherit the disease

Answer & Comments

Answer: 2- There is a 25% chance their child will inherit the disease

If both parents carry the sickle cell gene there is a 25% chance that their child will inherit the disease since the gene is inherited in an autosomal recessive fashion.

Although there is no primary prevention for sickle cell disease genetic counselling can help advise heterozygous parents.

Prenatal diagnosis is available by chorionic villus sampling at 8-10 weeks gestation or by amniocentesis at 14-16 weeks gestation.



[Q: 2683] OnExamination 2012 - Haematology

A 10-year-old boy is noticed to be jaundiced on return from a holiday in Africa with his parents. He is on antimalarial prophylaxis.

His complete blood count shows haemoglobin of 8 g/dL, with Heinz bodies and blister cells on blood film examination.

Which of the following relates to this disorder?

- 1- It is most commonly precipitated by peas
- 2- This is a common autosomal dominant disorder
- 3- The antimalarial prophylaxis has no relation to the laboratory findings
- 4- Transfusion is strictly merited in each case
- 5- Treatment involves strict avoidance of known precipitants

Answer & Comments

Answer: 5- Treatment involves strict avoidance of known precipitants

This question relates to the management of G-6-PD deficiency.

G-6-PD is the most common inherited enzyme defect in humans; an X linked inheritance pattern (hence answer B is incorrect).

It is mostly commonly precipitated by several classes of drugs, including antimalarials (hence answer C is incorrect) and is also associated with ingestion of broad beans (favism - hence answer A is incorrect).

Treatment revolves around avoidance of all known precipitating factors, and blood product support should only be given in

unstable, symptomatic patients (so answer D is incorrect).



[Q: 2684] OnExamination 2012 - Haematology

Which one of the following is in keeping with a diagnosis of myeloma-induced hypercalcaemia?

- 1- Acute hepatic failure
- 2- Colitis
- 3- Polyuria and polydipsia
- 4- Prolonged Q-T interval on ECG
- 5- Tetany

Answer & Comments

Answer: 3- Polyuria and polydipsia

Hypercalcaemia causes acute renal failure, a shortened Q-T interval on ECG as well as polyuria and polydipsia.

The abdominal symptoms include constipation, nausea and vomiting, peptic ulceration - due to increased gastrin secretion, abdominal pain and pancreatitis.

Tetany is caused by hypocalcaemia.

GP Notebook www.gpnotebook.com



[Q: 2685] OnExamination 2012 - Haematology

For which of the following patients would a gamma irradiated blood product be recommended?

- 1- A 37-year-old patient with Hodgkin's lymphoma receiving chemotherapy
- 2- A 16-year-old thalassaemic receiving regular transfusions
- 3- A 42-year-old lady receiving adjuvant hormonal therapy for breast cancer post radical mastectomy
- 4- A 19-year-old nulliparous female after a road traffic accident

5- Post-operatively for carcinoma of the colon in a 50-year-old male

Answer & Comments

Answer: 1- A 37-year-old patient with Hodgkin's lymphoma receiving chemotherapy

The most common indications for irradiated blood products include

Those at risk of transfusion associated graft versus host disease such as neonates

Those receiving purine analogues based chemotherapy

Hodgkin's lymphoma

Immunodeficiency states and

Post bone marrow transplants (hence option A is correct).

The other scenarios described here do not necessarily represent an immunosuppressed state in the list of conditions eligible for a irradiated blood product (options B, C, D and E are incorrect).



[Q: 2686] OnExamination 2012 - Haematology

You are asked to review urgently a 32-year-old woman who is receiving a blood transfusion following a post partum haemorrhage which occurred after the birth of her second baby.

Apparently she required a three unit blood transfusion after the birth of her first child. A short time after the transfusion began she became acutely short of breath, with saturations of only 91% on air, and severe wheezing.

On examination she is pyrexial 37.8°C, her BP is 110/60 mmHg, her pulse 89 and regular. She has marked bilateral wheeze on auscultation of her chest.

Investigations reveal

Haemoglobin 10.4 g/dl(11.5-16.0)

White cell count $8.3 \times 10^9/L$ (4-11)

Platelets $179 \times 10^9/L$ (150-400)

Serum sodium 138 mmol/l (135-146)

Serum potassium 3.7 mmol/l (3.5-5)

Serum creatinine 100 $\mu\text{mol/l}$ (79-118)

CXR Bilateral pulmonary infiltrates

paO₂ 8.4 kPa(10-13)

paCO₂ 5.2 kPa(4.8-6.1)

Which of the following is the most likely diagnosis?

1- Acute haemolytic transfusion reaction

2- Acute non-haemolytic transfusion reaction

3- Cardiogenic pulmonary oedema

4- IgE mediated transfusion reaction

5- Transfusion associated lung injury

Answer & Comments

Answer: 5- Transfusion associated lung injury

Transfusion associated lung injury (TRALI) occurs in patients who have received a multi-unit blood transfusion previously and are then re-transfused some time later.

Two hypotheses are proposed for the cause of TRALI, that it is either

Due to HLA antigens in the donor blood reacting with neutrophil antigens in the patient, leading to neutrophil migration to pulmonary capillaries

or that

The neutrophils responsible do not actually require donor HLA antigens to react, and are just primed by infection, surgery or inflammation.

What is common to both hypotheses though, is that the neutrophils lead to a local release of cytokines, increased capillary permeability, and non-cardiogenic pulmonary oedema, accounting for the presentation with wheeze and hypoxia which is seen here.



[Q: 2687] OnExamination 2012 -
Haematology

A 40-year-old lady presents with a swollen right calf. She has a history of mental health problems and is on a number of medications.

Which of the following treatments increases the risk of thromboembolism?

- 1- Antipsychotics
- 2- Benzodiazepines
- 3- Monoamine oxidase inhibitors
- 4- Selective serotonin reuptake inhibitors
- 5- Tricyclic antidepressants

Answer & Comments

Answer: 1- Antipsychotics

The oral contraceptive and antipsychotics are possible causes of thromboembolism.



[Q: 2688] OnExamination 2012 -
Haematology

In idiopathic thrombocytopenic purpura there are antibodies directed at which of the following?

- 1- ADP receptor
- 2- Antithrombin III
- 3- ATP receptor
- 4- Glycoprotein IIb/IIIa complex
- 5- Platelet-activating factor

Answer & Comments

Answer: 4- Glycoprotein IIb/IIIa complex

In many cases of idiopathic thrombocytopenic purpura, the cause is not actually idiopathic but autoimmune, with antibodies against platelets being detected in approximately 80% of patients.

Most often these antibodies are against platelet membrane glycoproteins IIb-IIIa or Ib-IX, and are of the IgG type.

The coating of platelets with IgG renders them susceptible to opsonisation and phagocytosis by splenic macrophages.



[Q: 2689] OnExamination 2012 -
Haematology

Which of the following hereditary cancer syndromes is associated with an increased risk of ovarian cancer?

- 1- Hereditary non-polyposis colorectal cancer
- 2- Multiple endocrine neoplasia
- 3- Peutz-Jeghers syndrome
- 4- von Hippel-Lindau syndrome
- 5- Xeroderma pigmentosa

Answer & Comments

Answer: 1- Hereditary non-polyposis colorectal cancer

While all of the above hereditary cancer syndromes cause a patient to be at an increased risk of developing various cancers, only HNPCC increases the risk of ovarian cancer (along with many other cancers).

This is due to inherited mutations with DNA mismatch repair.



[Q: 2690] OnExamination 2012 -
Haematology

A 16-year-old boy with easy bruising and excessive bleeding from a tooth extraction is found to have von Willebrand's disease.

He is due to have further dental extractions and DDAVP is prescribed.

What is the mechanism of action of DDAVP in von Willebrand's disease?

- 1- Acts as a substitute carrier for factor VIII
- 2- Inhibits breakdown of von Willebrand's factor
- 3- Prevents renal excretion of von Willebrand's factor

- 4- Stimulates release of von Willebrand's factor from endothelial cells
- 5- Turns on the gene associated with von Willebrand's factor production

Answer & Comments

Answer: 4- Stimulates release of von Willebrand's factor from endothelial cells

DDAVP may be given to increase the amount of the von Willebrand factor long enough for surgery or dental procedures to be performed.

DDAVP can provide a twofold to fivefold increase in plasma von Willebrand factor and factor VIII concentrations.

It induces cyclic adenosine monophosphate (cAMP)-mediated vWF secretion by a direct effect on endothelial cells.



[Q: 2691] OnExamination 2012 - Haematology

A 14-year-old boy presents with excessive bleeding from a tooth cavity following an extraction at the dentist.

His investigations show:

Haemoglobin 13.2 g/dL (13.0-18.0)

Platelet count $260 \times 10^9/L$ (150-400 $\times 10^9$)

White cell count $8 \times 10^9/L$ (4-11 $\times 10^9$)

Prothrombin time 14 s (11.5-15.5)

Activated partial thromboplastin time 45 s (30-40)

Factor VIII 45 U/dL (50-150)

Which of the following is the most likely diagnosis?

- 1- Disseminated intravascular coagulation
- 2- Haemophilia A
- 3- Haemophilia B
- 4- Idiopathic thrombocytopenic purpura
- 5- von Willebrand's disease

Answer & Comments

Answer: 5- von Willebrand's disease

This young boy with excessive bleeding has a slightly raised APTT and slightly reduced factor VIII.

Haemophilia is therefore unlikely and von Willebrand's is the most likely.

DIC and ITP would typically be associated with thrombocytopenia.



[Q: 2692] OnExamination 2012 - Haematology

A previously well 75-year-old lady presented with tiredness and a mildly raised lymphocyte count on her full blood count. A blood film reports 'Smudge cells seen. Is this lady known to have Chronic Lymphocytic Leukaemia?'

What is the most appropriate next investigation to confirm this lady's diagnosis?

- 1- Bone marrow aspirate
- 2- Bone marrow trephine
- 3- Immunophenotyping
- 4- Serum immunoglobulins
- 5- Ultrasound scan

Answer & Comments

Answer: 3- Immunophenotyping

"A definitive diagnosis of CLL is based on the combination of a lymphocytosis and characteristic lymphocyte morphology and immunophenotype." British Committee for Standards in Haematology Guideline for CLL diagnosis 2005

The other tests are additional investigations all used in the workup of CLL.



[Q: 2693] OnExamination 2012 - Haematology

A 35-year-old lady presented with left-sided weakness.

She has a young family with a 5-year-old son and a 2-year-old daughter. Previously she had two spontaneous abortions. After the birth of her last child she developed a deep vein thrombosis (DVT) and received three months of anticoagulation with warfarin.

On examination she has left-sided weakness with pyramidal signs. A CT head scan showed a right middle cerebral artery territory infarct.

Which of the following is the most likely diagnosis?

- 1- Hypertension
- 2- Kawasaki syndrome
- 3- Patent foramen ovale
- 4- Systemic lupus erythematosus
- 5- Thrombotic thrombocytopenic purpura

Answer & Comments

Answer: 4- Systemic lupus erythematosus

This patient has a prothrombotic tendency suggestive of the lupus anticoagulant with recurrent abortions, previous DVT and now she has developed a left hemiparesis.



[Q: 2694] OnExamination 2012 - Haematology

A 22-year-old male presents with episodic nausea and abdominal pain although he has maintained a normal weight. The symptoms have been attributed to irritable bowel syndrome. There are no abnormalities on examination.

Blood tests were performed which reveal:

Haemoglobin 12.2 g/dl(13.0-18.0)

MCV 92 fl(80-96)

White cell count $6.5 \times 10^9/L$ (4-11)

Platelets $310 \times 10^9/L$ (150-400)

Reticulocytes 5%(0.5-2.4)

Bilirubin 42 $\mu\text{mol/l}$ (1-22)

AST/ALP Normal

Coombs' test Negative

Haptoglobin Undetectable

Which of the following is the likely diagnosis?

- 1- Acute intermittent porphyria
- 2- Dubin-Johnson syndrome
- 3- Gilbert's syndrome
- 4- Hereditary spherocytosis
- 5- Viral hepatitis

Answer & Comments

Answer: 4- Hereditary spherocytosis

This patient has an elevated bilirubin concentration and elevated reticulocyte count suggesting haemolysis.

The most likely explanation would be hereditary spherocytosis which could be confirmed on blood film. This too explains the symptoms - nausea and abdominal pains suggesting gallstones, which are common even in mild disease.



[Q: 2695] OnExamination 2012 - Haematology

A 48-year-old woman presents with a history of intestinal polyps and multiple lipomas on the arms and back. She now has a small palpable nodule in her neck. Thyroid function tests and thyroid antibodies are normal.

Which of the following tumours is she at increased risk of developing?

- 1- Anaplastic carcinoma of the thyroid
- 2- Follicular carcinoma of the thyroid
- 3- Medullary carcinoma of the thyroid
- 4- Papillary carcinoma of the thyroid
- 5- Thyroid lymphoma

Answer & Comments

Answer: 4- Papillary carcinoma of the thyroid

This lady has Gardner's syndrome, or familial adenomatous polyposis, characterised by multiple small and large intestinal tumours and lipomas. Osteomata and fibromas are also seen.

It is a rare familial condition, when arising from mutations of the APC gene is inherited in an autosomal dominant fashion.

Gardener's syndrome carries an increased risk of papillary carcinoma of the thyroid with a preponderance for female patients.



[Q: 2696] OnExamination 2012 - Haematology

A 30-year-old male patient presents with sudden deterioration and haematuria 15 minutes after starting blood transfusion.

His pulse rate is 120 beats per minute and blood pressure is 70/ 40 mmHg.

Which of the following is the most likely cause?

- 1- ABO incompatibility
- 2- Anaphylaxis to anaesthetic agents
- 3- Disseminated intravascular coagulation
- 4- Graft versus host disease
- 5- Rhesus incompatibility

Answer & Comments

Answer: 1- ABO incompatibility

Immediate life threatening reactions with intravascular haemolysis are caused by complement activating IgG or IgM antibodies.

They are usually ABO antibodies and these reactions can occur after transfusion of a few millilitres of blood.



[Q: 2697] OnExamination 2012 - Haematology

A 62-year-old male undergoes surgery for caecal carcinoma.

Which of the following tumour markers is most appropriate for the continued surveillance of this patient?

- 1- AFP
- 2- CA 19-9
- 3- CA 27-29
- 4- CA 125
- 5- CEA

Answer & Comments

Answer: 5- CEA

CEA is the most appropriate tumour marker for the monitoring of potential recurrence of colonic cancer.

CEA is also elevated in breast, melanoma and pancreatic malignancy to name but a few.

The value of CA 19-9 is higher concentrations often reflect more advanced pancreatic cancer.



[Q: 2698] OnExamination 2012 - Haematology

A 27-year-old woman presented with a history of sudden onset right-sided weakness and dysphasia lasting eight hours. She had returned to the United Kingdom from Australia two days previously.

There was no significant past medical history and physical examination was normal. Chest x ray, ECG and a CT head scan were all normal.

Which one of the following investigations is most likely to reveal the underlying cause of this episode?

- 1- Carotid Doppler ultrasonography
- 2- Cerebral angiography
- 3- MRI of head
- 4- Transoesophageal echocardiography
- 5- Transthoracic echocardiography

Answer & Comments

Answer: 4- Transoesophageal echocardiography

The history here suggests a lower limb deep vein thrombosis with peripheral embolus through a patent foramen ovale, leading to a left sided cerebrovascular event.

This is termed the paradoxical embolus so-called because a thromboembolus arising from the venous circulation can end up in the systemic circulation.

Transoesophageal echocardiography is the investigation of choice to investigate for a patent foramen ovale, although transthoracic echocardiography with contrast may be an alternative.



[Q: 2699] OnExamination 2012 - Haematology

A 52-year-old male presents with a history of lethargy and epistaxis over the last one month.

Examination reveals numerous bruises over arms and legs, splenomegaly and retinal haemorrhages.

A full blood count shows:

Haemoglobin 7 g/dL (13.0-18.0)

White cell count $14 \times 10^9/L$ ($4-11 \times 10^9$)

Platelet count $20 \times 10^9/L$ ($150-400 \times 10^9$)

His blood film reveals white cells predominantly myeloblasts and promyelocytes

Which one of the following investigations would be of most prognostic value?

- 1- Bone marrow aspiration
- 2- Bone marrow trephine biopsy
- 3- Cerebrospinal fluid examination
- 4- Cytogenetic karyotype
- 5- Immunophenotyping

Answer & Comments

Answer: 4- Cytogenetic karyotype

The history, full blood count results and the blood film are suggestive of acute myeloid leukaemia as there are numerous myeloblasts on film.

Of the answers given the cytogenetic karyotype is of most prognostic value.

The cytogenetic karyotype divides people into three categories:

Good risk

Standard risk and

Poor risk.



[Q: 2700] OnExamination 2012 - Haematology

A 65-year-old woman is seen in the oncology clinic following a diagnosis of a strongly oestrogen/progesterone receptor positive breast cancer.

She is considered for adjuvant treatment with anastrozole, an endocrine agent.

What further investigation does this patient require?

- 1- Bone scan
- 2- Chest x ray
- 3- CT chest, abdomen and pelvis
- 4- DEXA scan
- 5- Urine dip

Answer & Comments

Answer: 4- DEXA scan

Aromatase inhibitors work by preventing peripheral conversion of oestrogen and therefore cause profound oestrogen deprivation in a post-menopausal woman.

This increases the risk of osteoporosis and fragility fractures.

A DEXA scan must be done at the start of treatment to identify those patients in whom a bisphosphonate must be considered for bone protection.



[Q: 2701] OnExamination 2012 - Haematology

A 62-year-old male attends the Emergency Department with a severe nose bleed. He is known to have alcoholic cirrhosis.

His investigations reveal:

Haemoglobin 10.9 g/dl(13.0-18.0)

White cell count $5 \times 10^9/L$ (4-11)

Platelet count $60 \times 10^9/L$ (150-400)

Prothrombin time 17.5 s(11.5-15.5)

APPT 42 s(30-40)

Fibrinogen 0.7 g/l (1.8-5.4)

What is the most appropriate blood product for this patient?

- 1- Cryoprecipitate
- 2- Factor VIII
- 3- Platelets
- 4- Prothrombin complex concentrate
- 5- Whole blood

Answer & Comments

Answer: 1- Cryoprecipitate

The most significant abnormality is the low fibrinogen. Therefore the best product to correct the fibrinogen out of those given is cryoprecipitate.

To correct a coagulopathy you need to aim for:

Fibrinogen >1.0 g/l

Platelets $>50 \times 10^9/L$

PT and APTT <1.5 upper range of normal

So from the results you can see the most significant abnormality is the low fibrinogen.

The platelets are low and activated partial thromboplastin time/prothrombin time (APTT/PT) prolonged but not really sufficient to cause bleeding.



[Q: 2702] OnExamination 2012 - Haematology

A 30-year-old man presents with episodic jaundice and anaemia and has been diagnosed with glucose-6-phosphate dehydrogenase (G6PD) deficiency.

On further testing his wife has normal plasma G6PD activity.

What is the risk of their children developing this condition?

Which one of the following statements is correct?

- 1- 50% of their children will be affected, irrespective of gender
- 2- All their children will be affected
- 3- All their daughters will be affected
- 4- All their sons will be affected
- 5- None of their children will be affected

Answer & Comments

Answer: 5- None of their children will be affected

G6PD is X linked - therefore females are carriers, and are not usually affected, unless there is inactivation of their X chromosome. Males are affected.

Males will pass on the 'bad' X chromosome to their daughters so that they become carriers, and as said above they are not usually affected. Males pass on their Y chromosomes to any sons, therefore they will not be affected.

In the question the male is affected, but as the female has normal levels of the enzyme, we are assuming she is not a carrier (although

strictly she could be a carrier and have normal levels).

The male will pass on the X chromosome to any daughters, who will not be affected, as they will have a 'good' X from the mothers, and the father will pass on the Y chromosome to his sons, who will not be affected.



[Q: 2703] OnExamination 2012 - Haematology

A 32-year-old man was prescribed an oral antibiotic for a urinary tract infection.

Two days later he noticed that his urine was increasingly dark in colour.

Investigations revealed:

Haemoglobin 8.5g/dL (13.0-18.0)

Reticulocytes $147 \times 10^9/L$ (25-85 $\times 10^9$)

Blood film: marked anisopoikilocytosis and bite cells.

What is the most likely diagnosis?

- 1- Acute myeloid leukaemia
- 2- Autoimmune haemolytic anaemia
- 3- Haemoglobin H disease
- 4- Hereditary spherocytosis
- 5- Paroxysmal cold haemoglobinuria

Answer & Comments

Answer: 2- Autoimmune haemolytic anaemia

Paroxysmal cold haemoglobinuria (PCH) is a rare type of autoimmune haemolytic anaemia (AIHA) occurring primarily in children.

The classic symptom of PCH is a sudden onset of haemoglobinuria following exposure to cold, even for a few minutes. Symptoms may occur minutes to hours following exposure to cold. Haemoglobinuria is not always present because in some persons with PCH the autoantibody level is not high enough to cause intravascular haemolysis. PCH is usually of

abrupt onset in the setting of an infectious disease.

Given the patient's age and the specific history in this case the diagnosis is unlikely to be PCH.

If the diagnosis were hereditary spherocytosis then the blood film would show spherocytes.

In haemoglobin H disease the typical inclusions can be demonstrated in erythrocytes stained with brilliant cresyl blue and a chronic microcytic, hypochromic anaemia would be present.

Haemolytic anaemia may be precipitated by sulfonamides and also by penicillins.

This gentleman may have been treated with trimethoprim or a penicillin which then caused AIHA with the typical blood film.

The most appropriate answer to this question is B, given the patient's age, the lack of history of exposure to cold, and the history which is given of antibiotic prescription.



[Q: 2704] OnExamination 2012 - Haematology

You have been called to the ward by the senior nurse, to review a repeat calcium result. The repeat result is 3.9 mmol/l (2.2-2.6), the previous result four hours earlier was 3.2.

The patient has a disseminated malignancy with an unknown primary.

Which of the following statements is most correct when considering the hypercalcaemia of malignancy?

- 1- A prolonged QT interval is associated with hypercalcaemia
- 2- Bisphosphonates inhibit osteoblast function thereby lowering calcium
- 3- Calcitonin is of greater benefit than bisphosphonates in the treatment of hypercalcaemia of malignancy

- 4- NSAIDs are indicated for bone pain in this patient
- 5- On neurological examination, hyporeflexia may be exhibited

Answer & Comments

Answer: 5- On neurological examination, hyporeflexia may be exhibited

This is an oncological emergency affecting 20-40% of patients with advanced cancer.

Hyporeflexia is a common clinical sign in patients with significant hypercalcaemia.

Other signs include the classic mnemonic:

Bones - Bone pain, especially if the PTH is elevated

Stones - Renal calculi

Groans - Constipation and likely subsequent abdominal pain

Psychic moans - Depression and confusion

As well as nausea and vomiting, fatigue and pancreatitis.

Electrocardiogram changes in hypercalcaemia include bradycardia, prolonged PR interval, short QT interval, widened T waves and arrhythmias.

Bisphosphonates inhibit bone resorption by osteoclasts, and are the first line pharmacological treatment of hypercalcaemia of malignancy.

Calcitonin use is limited by its association with anaphylaxis.

Non-steroidal anti-inflammatory drugs (NSAIDs) should not be prescribed in patients with hypercalcaemia as they reduce renal blood flow thus inhibiting urinary calcium excretion.



[Q: 2705] OnExamination 2012 - Haematology

Which of the following patients with Hodgkin's disease has the worst prognosis?

- 1- 25-year-old man with inguinal lymphadenopathy
- 2- 25-year-old woman with mediastinal and inguinal lymphadenopathy
- 3- 25-year-old woman with mediastinal and inguinal lymphadenopathy and night sweats
- 4- 25-year-old man with mediastinal and inguinal lymphadenopathy and pruritis
- 5- 25-year-old man with cervical and mediastinal lymphadenopathy

Answer & Comments

Answer: 3- 25-year-old woman with mediastinal and inguinal lymphadenopathy and night sweats

Prognosis in Hodgkin's disease depends on staging and presence of B symptoms.

Patient A has Stage IA disease (one lymph node area).

Patient E has stage IIA disease (two lymph node areas on same side of diaphragm).

Patients B and D have stage IIIA disease (disease in lymph nodes on both sides of diaphragm).

Pruritis is not a B symptom and is not of prognostic significance.

Patient C has stage IIIB disease (as night sweats are a B symptom).



[Q: 2706] OnExamination 2012 - Haematology

A 64-year-old man has terminal cancer with hepatic metastases. He is treated with oral morphine (Oramorph) solution for pain relief.

Which is the most important pharmacodynamic factor in determining the appropriate timing between doses?

- 1- Bioavailability
- 2- First pass metabolism
- 3- Gastric emptying
- 4- Plasma half life
- 5- Renal clearance

Answer & Comments

Answer: 4- Plasma half life

Morphine undergoes extensive first pass metabolism in the liver.

However it is the plasma half life which defines the timing of the doses.

An increased dose may be required if the patient develops tolerance to the morphine dose.



[Q: 2707] OnExamination 2012 - Haematology

Which one of the following statements is true of B cell CLL?

- 1- Autoimmune thrombocytopenia is uncommon
- 2- Diffuse infiltration of bone marrow indicates good prognosis
- 3- Late transformation to ALL occurs in the majority of patients
- 4- Reduced immunoglobulins are a risk of recurrent viral infections
- 5- Stage A disease should be treated with chemotherapy

Answer & Comments

Answer: 1- Autoimmune thrombocytopenia is uncommon

Immune thrombocytopenia occurs in only 2% of cases.

Hypogammaglobulinaemia predisposes to encapsulated bacteria, for example, pneumococcus/H. influenzae causes death in 30% cases.

There are two transformations in chronic lymphocytic leukaemia (CLL):

CLL/PL (10%)

Richter's syndrome (5% = high grade non-Hodgkin's lymphoma).

Treatment only for Stage B, C and A with clear evidence of progression.



[Q: 2708] OnExamination 2012 - Haematology

Regarding retinoblastoma which of the following statements is correct?

- 1- Bilateral involvement is found in 70% of cases.
- 2- The predisposition may be inherited as an autosomal recessive condition.
- 3- There is an increased risk of autoimmune disease.
- 4- They have often metastasised by the time of diagnosis.
- 5- They usually present with leukocoria.

Answer & Comments

Answer: 5- They usually present with leukocoria.

The incidence is 1 in 16,000 live births.

Genetic predisposition occurs in 20% of patients with unilateral disease, and 30% of patients with bilateral disease.

The gene has been localised to 13q and the inherited form is associated with an increased risk of malignancy such as osteosarcoma and pineal tumours. It may be inherited as autosomal dominant.

The commonest presentation is leukocoria (yellowish white pupil reflex), and there may be diminished or absent vision or strabismus.

Late symptoms are pupil irregularity, hyphema, pain, proptosis, and signs of raised intracranial pressure.

The tumours have rarely metastasised before they are detected.



[Q: 2709] OnExamination 2012 - Haematology

A 23-year-old male presents with a deep vein thrombosis (DVT). He has no past medical history but his mother has suffered from deep vein thromboses.

Which of the following is likely to be found on haematological assessment?

- 1- Antithrombin deficiency
- 2- Factor V (FV) Leiden mutation
- 3- Lupus anticoagulant
- 4- Protein C deficiency
- 5- Protein S deficiency

Answer & Comments

Answer: 1- Antithrombin deficiency

Antithrombin deficiency is an autosomal dominant (AD) condition present in 0.02-1.1% of the population and is found in 4% of subjects who present with a thromboembolism.

Factor V Leiden is a possibility, although it seems less likely as the inheritance pattern seems more likely to be AD.

Similarly as the son had a DVT this would be far less likely with FV Leiden than antithrombin (AT) III, as thrombosis is more often precipitated in females on the oral contraceptive pill (OCP).

See Simioni P, Sanson BJ, Prandoni P, et al. Thromb Haemost 1999 Feb;81(2):198-202,

who show that "The annual incidences of total and spontaneous venous thromboembolic events in carriers of AT, PC or PS defects (n=181) were 1.01% and 0.40%, respectively, as compared to 0.10% and 0.04% in non-carriers, respectively (relative risks both 10.6). In carriers of Factor V Leiden (n= 224), the annual incidences of total and spontaneous venous thromboembolism were 0.28% and 0.11%, respectively, as compared to 0.09% and 0.04% in non-carriers, respectively (relative risks 2.8 and 2.5)."

See also "Risk of a first venous thrombotic event in carriers of a familial thrombophilic defect. The European Prospective Cohort on Thrombophilia (EPCOT)." J Thromb Haemost. 2005 Mar;3(3):459-64



[Q: 2710] OnExamination 2012 - Haematology

Which of the following statements is true of sarcoidosis?

- 1- Central caseation occurs in the sarcoid granuloma
- 2- Hypercalcaemia due to increased renal synthesis of 1-hydroxylase
- 3- It can produce Mikulicz's syndrome
- 4- Prognosis is poor when sarcoidosis presents acutely with bilateral hilar lymphadenopathy and erythema nodosum
- 5- Serum angiotensin converting enzyme (ACE) is useful for diagnosis of sarcoidosis

Answer & Comments

Answer: 3- It can produce Mikulicz's syndrome

Lofgren's syndrome is the combination of erythema nodosum and bilateral hilar lymphadenopathy (stage 1 radiograph). The prognosis is good with 80% resolving spontaneously, and have a normal CXR after one year.

Hypercalcaemia (2-10%) and hypercalciuria (up to 50%) are well recognised in sarcoidosis. The pattern resembles hypervitaminosis D, with:

Elevated serum calcium

Normal serum phosphate and

Normal/slightly raised alkaline phosphatase.

There is elevated 1,25-dihydroxycholecalciferol due to increased production by alveolar pulmonary macrophages and macrophages in granulomata.

Treat with rehydration and corticosteroids.

Serum ACE is produced by sarcoid granulomata from activation and differentiation of monocyte-macrophage system. It is a membrane bound glycoprotein, found mainly in the lung capillary endothelium.

ACE has poor diagnostic sensitivity (ability to detect disease) and specificity (ability to exclude disease), but is raised in active sarcoidosis. It is useful in monitoring of disease activity.

Mikulicz's syndrome is the enlargement of lacrimal glands and parotid glands, caused by sarcoidosis. Other causes include lymphoma and leukaemia.

Sarcoidosis is chronic multisystem non-caseating granulomatous disease. Central fibrinoid necrosis may occur, but tends to be focal and limited unlike the purulent necrosis/caseation seen in tuberculosis.



[Q: 2711] OnExamination 2012 - Haematology

Which of the following has been shown to increase the risk of prostate cancer?

- 1- Caucasian ethnicity
- 2- Exposure to cadmium

- 3- Family history of colon cancer
- 4- Low intake of animal fats
- 5- Occupational exposure to dust

Answer & Comments

Answer: 2- Exposure to cadmium

Black African and black Caribbean ethnicity is associated with a higher risk of prostate cancer than white.

A family history of breast cancer increases the risk of prostate cancer, as does a family history of prostate cancer.

An occupation in farming also seems to increase the risk of prostate cancer.

High intake of animal fats, and low selenium intake, as well as exposure to radiation and cadmium all increase the risk of prostate cancer.



[Q: 2712] OnExamination 2012 - Haematology

Concerning neurofibromatosis type 1 (NF1), which one of the following statements is true?

- 1- Bilateral acoustic neuromas are common
- 2- Clinical severity in individuals is similar in a given family
- 3- New mutations occur rarely
- 4- Pigmented spots on the iris are a characteristic feature
- 5- The diagnosis is likely if two café au lait patches are present

Answer & Comments

Answer: 4- Pigmented spots on the iris are a characteristic feature

Lisch nodules of the iris are present in more than 90% of patients.

Bilateral acoustic neuromas are a hallmark feature of neurofibromatosis type 2.

Expressivity of the gene is highly variable and members of the same family usually show wide differences in clinical symptoms.

NF1 is one of the most common autosomal dominant conditions. However almost half of all cases give no family history and are new mutations. The mutation rate is estimated to be 1:10,000 gametes.

The diagnosis is suggested by six or more café au lait macules (spots), each over 5 mm in diameter in prepubescent individuals and over 15 mm in post pubertal individuals.



[Q: 2713] OnExamination 2012 - Haematology

A 64-year-old man presents with haematuria.

Cystoscopy discovers a transitional cell carcinoma of the bladder.

Occupational exposure to which of the following is a recognised risk factor for bladder cancer?

- 1- Aflatoxin
- 2- Aniline dye
- 3- Beryllium
- 4- Mercury
- 5- Strongyloides stercoralis

Answer & Comments

Answer: 2- Aniline dye

Risk factors for bladder cancer include

Smoking

Exposure to aniline dyes in the printing and textile industry

Rubber manufacture

Cyclophosphamide

Schistosomiasis.



[Q: 2714] OnExamination 2012 - Haematology

Which of the following statements is most true regarding polycythaemia rubra vera (PRV)?

- 1- PRV is often associated with hypertension and smoking
- 2- PRV is usually associated with a high haemoglobin, but with neutropenia and thrombocytopenia
- 3- PRV may be characterised by a raised packed cell volume (PCV) and decreased plasma volume
- 4- The diagnosis of PRV is based on a high red cell mass, normal oxygen saturations and splenomegaly
- 5- Venesection treatment will improve long term survival rates

Answer & Comments

Answer: 4- The diagnosis of PRV is based on a high red cell mass, normal oxygen saturations and splenomegaly

The diagnosis of PRV is based on a high red cell mass, normal oxygen saturations and splenomegaly.

A decreased plasma volume causing a raised PCV is known as apparent or spurious polycythaemia. This may be associated with hypertension or smoking.

PRV is usually associated with a raised haemoglobin and often with a high platelet count and white cell count.

Venesection will lessen the rates of thrombotic complications but there is no evidence that venesection improves long term survival rates.



[Q: 2715] OnExamination 2012 -
Haematology

A 21-year-old man with non-Hodgkin's lymphoma and haemolytic anaemia is assessed for splenectomy.

When should Pneumovax vaccine be administered?

- 1- One month after surgery
- 2- One month before surgery
- 3- One week after surgery
- 4- One week before surgery
- 5- Perioperatively

Answer & Comments

Answer: 2- One month before surgery

The vaccine should be given a minimum of two weeks before elective splenectomy in order to ensure an optimal antibody response.

In emergency splenectomy the patient should be immunised as soon as possible after recovery from the operation and before discharge from hospital.

Unvaccinated patients splenectomised some time earlier should be vaccinated at the first opportunity.

Vaccination is delayed for at least six months after immunosuppressive chemotherapy or radiotherapy during which time prophylactic antibiotics should be given.



[Q: 2716] OnExamination 2012 -
Haematology

A 62-year-old Caribbean man with new onset type 2 diabetes presents to the Emergency department.

He has increasing lethargy and tiredness since starting a sulphonylurea a few days earlier.

On examination he has jaundiced sclerae, his BP is 135/72 mmHg, and pulse is 95. His mucous membranes look a little pale.

Investigations show:

Haemoglobin 10.2 g/dl (13.5-17.7) (Heinz bodies seen)

White cell count $10.2 \times 10^9/l$ (4-11)

Platelets $198 \times 10^9/l$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 4.4 mmol/l (3.5-5)

Creatinine 88 $\mu\text{mol/l}$ (79-118)

Bilirubin 80 $\mu\text{mol/l}$ (<17)

Which of the following is the most likely diagnosis?

- 1- Autoimmune haemolytic anaemia
- 2- Cold agglutinin disease
- 3- Glucose-6-phosphate dehydrogenase deficiency
- 4- Obstructive jaundice
- 5- Paroxysmal nocturnal haemoglobinuria

Answer & Comments

Answer: 3- Glucose-6-phosphate dehydrogenase deficiency

Autoimmune haemolytic anaemia would be associated with a more chronic course, and the close proximity to use of sulphonylurea is much more suggestive of G-6-PD deficiency.

Cold agglutinins are associated with mycoplasma or haematological malignancy.

Obstructive jaundice would not usually be associated with anaemia

Paroxysmal nocturnal haemoglobinuria (PNH) presents with episodes of haemolysis and

Venous thrombosis usually at a younger age.



[Q: 2717] OnExamination 2012 -
Haematology

An elderly lady with breast cancer is starting diamorphine elixir for painful bony metastases.

Which of the following is the most appropriate comment to make to her caregiver?

- 1- A laxative will need to be used
- 2- Dependence on diamorphine is likely and could cause problems
- 3- If pain relief is not adequate cocaine may need to be introduced
- 4- Sedation is likely to be an ongoing problem with diamorphine
- 5- The same dose could be given IM to achieve the same effect.

Answer & Comments

Answer: 1- A laxative will need to be used

A laxative should always be started in conjunction with narcotics to avoid distressing constipation.

Sedation occurring in the first few days typically wears off.

If pain relief is inadequate the dose should be increased; cocaine may produce hallucinations.

Addiction is not an issue in the terminally ill.

IM is three times more effective than the same oral dose.



[Q: 2718] OnExamination 2012 - Haematology

A 31-year-old woman comes to the clinic for review of chronic diarrhoea. She tells you she is opening her bowels some four to five times per day, and has lost 5 kg in weight over the past six months.

There is no blood and the diarrhoea has a strong smell and is difficult to flush away.

On examination her BP is 110/70 mmHg, pulse is 75 and regular, her BMI is 21.

Investigations show:

Haemoglobin 10.8 g/dl(11.5-16.0)

MCV 75 fL(80-96)

White cell count $9.3 \times 10^9/L$ (4-11)

ESR 41 mm/hr(<10)

Platelets $182 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (135-146)

Potassium 3.6 mmol/l (3.5-5)

Creatinine 115 micromol/l (79-118)

Albumin 24g/L(35-50)

Which of the following investigations is likely to be most useful in confirming the diagnosis?

- 1- Anti-endomysial antibodies
- 2- Colonoscopy
- 3- CT abdomen
- 4- Faecal elastase
- 5- Faecal fat estimation

Answer & Comments

Answer: 1- Anti-endomysial antibodies

The age of the patient and symptoms consistent with malabsorption, coupled with low albumin and iron deficiency anaemia fit best with a diagnosis of coeliac disease. As such anti-endomysial antibodies are the most appropriate of the investigations listed to confirm the diagnosis.

Colonoscopy is useful only if lower GI pathology is suspected, and CT abdomen is not very useful to confirm a diagnosis of coeliac.

Faecal elastase is a test for pancreatic insufficiency, and whilst faecal fat estimation will be useful in confirming malabsorption, it will not differentiate between pancreatic pathology and small bowel disease.



[Q: 2719] OnExamination 2012 - Haematology

What is the mechanism of action of hydroxycarbamide in the setting of its use in sickle cell disease?

- 1- Stimulation of the production of fetal haemoglobin
- 2- Decreasing the tendency of HbS to polymerise
- 3- Reducing the permeability of red blood cell membranes
- 4- Increasing the life span of sickle shaped red blood cells
- 5- Causing vasodilation

Answer & Comments

Answer: 1- Stimulation of the production of fetal haemoglobin

Stimulation of the production of fetal haemoglobin is its use in sickle cell anaemia; its usual mode of action is on its reduction of production of deoxyribonucleotides via inhibition of the enzyme ribonucleotide reductase. Hydroxycarbamide works by stimulating the production of fetal haemoglobin which protects against sickling.

In HbS the negative charge is lost and this removes the inhibition to polymerise.

HbS polymers interact with the red blood cell membrane creating temporary pores thus increasing permeability.

HbS has a life span of 30 days compared to the normal 120 days.

Vasodilation is caused by nitric oxide (endothelial derived relaxing factor).

Option A is correct, as this is the correct mechanism of action.

Option B is incorrect as this is the incorrect mechanism of action.

Option C is incorrect as this is the incorrect mechanism of action.

Option D is incorrect as this is the incorrect mechanism of action.

Option E is incorrect as this is the incorrect mechanism of action.



[Q: 2720] OnExamination 2012 - Haematology

Which of the following are features of acute chest syndrome?

- 1- Chest pain
- 2- Shortness of breath
- 3- Fever
- 4- Evidence of new infiltration on CXR
- 5- All of the above

Answer & Comments

Answer: 5- All of the above

Acute chest syndrome is defined as a 'new infiltrate consistent with consolidation at least segmental in size, and one of: chest pain, a temperature > 38.5°C, tachypnoeic, wheezing or cough'.

It is important to remember that not all of the above features will be present at the same time, CXR changes often lag behind. The key is to have a high index of suspicion and monitor vital signs particularly oxygen saturations regularly and anticipate development of possible acute chest syndrome. Early recognition and treatment is life saving.

Option A is correct. Chest pain is often a feature of acute chest syndrome, either from the onset or presents later during the course of disease.

Option B is correct. Shortness of breath is an important feature of acute chest syndrome and one of the main markers of deterioration indicating the need for possible exchange transfusion. All sickle patients should have their oxygen saturations measured regularly on air.

Option C is correct. Fever, usually temperature of greater than 38.5°C is another recognised feature of acute chest syndrome. All patients with temperatures more than 38°C should have cultures sent.

Option D is correct. Although new infiltrates are a characteristic feature of acute chest syndromes, it is important to remember that they can lag behind, and treatment should not be delayed in the absence of CXR changes if all other clinical signs suggest acute chest syndrome.

Option E is correct. This is the best answer as acute chest syndrome is a combination of signs and symptoms, not all of them need to be present for a diagnosis to be made.



[Q: 2721] OnExamination 2012 - Haematology

A pregnant woman attends for her booking antenatal appointment. She lives and is being treated within a high prevalence trust.

How will screening for sickle cell disease be undertaken?

- 1- She will automatically be offered chorionic villus sampling at 8-10 weeks gestation
- 2- It will depend on the family origin of herself and her partner
- 3- She will first be screened for sickle cell carrier status. If that test is positive, her partner will be screened, and only if both are positive will she be offered chorionic villus sampling or amniocentesis
- 4- The screening only detects HbS. It does not detect any other haemoglobinopathies
- 5- Amniocentesis cannot distinguish whether the fetus has sickle cell trait or sickle cell disease

Answer & Comments

Answer: 3- She will first be screened for sickle cell carrier status. If that test is positive, her partner will be screened, and only if both are positive will she be offered chorionic villus sampling or amniocentesis

In low prevalence trusts laboratory screening is only carried out if the baby is identified as being at risk of a haemoglobinopathy based

on the family origin questionnaire and a routine full blood count from the mother.

In high prevalence trusts all women undergo the initial laboratory screening to identify if the mother carries the sickle cell gene. The father is tested for carrier status only if the mother is found to be a carrier. If both are found to be carriers this is confirmed by genetic testing before offering chorionic villus sampling (CVS) (8-10 weeks) or amniocentesis (14-16 weeks).

Option A is incorrect because CVS is only offered if both parents are found to carry the sickle cell gene.

Option B is incorrect because in high prevalence trusts all women undergo laboratory testing for carrier status regardless of family origin. However, the family origin questionnaire still needs to be completed to facilitate diagnosis of the type of haemoglobinopathy.

Option C is correct. First the mother is screened for carrier status, and then the father is screened only if the mother is a carrier. Only if both parents are genetically confirmed as carriers is the mother offered chorionic villus sampling or amniocentesis.

Option D is incorrect. The screening will also detect some other haemoglobinopathies, some of which are clinically significant, some of which have no clinical significance.

Option E is incorrect because amniocentesis allows genetic testing, which can distinguish sickle cell disease from sickle cell trait.



[Q: 2722] OnExamination 2012 - Haematology

A 6-month-old baby is noticed to be pale and listless.

His complete blood count shows haemoglobin of 6 g/dL, and his blood picture shows a hypochromic, microcytic picture. Genetic testing shows the ?0?0 genotype.

Which is the correct answer relating to this haematological disorder?

- 1- Iron chelation is only possible with subcutaneous or intravenous infusion of desferrioxamine
- 2- A transfusion programme with iron chelation is the best initial approach
- 3- Transfusion support should be used sparingly considering the risks of transmission of infections and iron overload
- 4- The parents and other siblings should not be screened by genetic testing
- 5- There is no increased risk of gallstone formation or bone deformities

Answer & Comments

Answer: 2- A transfusion programme with iron chelation is the best initial approach

This question relates to the management of severe beta thalassaemia major.

Beta thalassaemia major is characterised by anaemia, splenomegaly, bone deformities and early death if not treated appropriately (option E is incorrect).

Treatment revolves around lifesaving red cell concentrate support (option C is incorrect), with the inherent development of transfusional iron overload, which can be managed with iron chelation, both intravenous/subcutaneous (desferrioxamine) or oral (deferasirox - option B is correct).

The next of kin should be offered screening (option D is incorrect).

Regular transfusion with attention to iron chelation is the mainstay of treatment, although haemopoietic stem cell transplantation has a possible role with curative intent - hence option B is the correct answer.



[Q: 2723] OnExamination 2012 - Haematology

A 25-year-old gentleman with Burkitt's lymphoma is admitted and commenced on induction chemotherapy.

Within 48 hours it is noticed that his urine output is dropping to 20 mls/hr. Further investigation shows potassium of 6.5 mmol/L, calcium of 1.5 mmol/L, phosphate of 4 mmol/L and creatinine of 250 µmol/L.

Which of the following is the most appropriate management of this complication?

- 1- Allopurinol and intravenous hydration
- 2- Intravenous hydration with 3L/m2 and rasburicase.
- 3- Intravenous hydration with 3 litres per day
- 4- Rasburicase only
- 5- Urinary alkalinisation

Answer & Comments

Answer: 2- Intravenous hydration with 3L/m2 and rasburicase.

This question concerns the management of acute tumour lysis syndrome (ATLS).

Acute tumour lysis syndrome is a common complication of haematological tumours which have a high proliferation index, for example, Burkitt's lymphoma, hyperleukocytic acute myelogenous leukaemia (AML), diffuse large B-cell lymphoma.

Management revolves around institution of aggressive hydration, aiming for 3L/m2 control of electrolyte disturbances (typically, hypocalcaemia, hyperphosphataemia, hyperkalaemia and uraemia) and clearance of the increased metabolic load with rasburicase, a specific recombinant enzyme.

Thus options A, C, D and E should not be selected since they omit important aspects of the holistic management of acute tumour lysis syndrome.



[Q: 2724] OnExamination 2012 -
Haematology

A regular donor reports yellow discoloration of his eyes and fevers five days after a blood donation.

What would be the next most appropriate course of action for the blood bank medical officer?

- 1- APlatelets are safe to be released in this situation
- 2- Release all the blood products from this donor if initial testing is negative
- 3- Recall blood products from this donor and arrange for retesting of this donor
- 4- DSelected blood products such as red cell packs may be released as these have a small volume of plasma
- 5- The donor needs to be struck off the donor register

Answer & Comments

Answer: 3- Recall blood products from this donor and arrange for retesting of this donor

Depending on the complications developed by the donor an assessment must be made on how to manage the donor as well as the blood products from the donation.

In this case, the blood products must be recalled till further testing and clarification of the donor illness (option C).

Release of one or any of the blood products must be prevented (hence not options A, B or D).

The donor need not be struck off the register at this stage till further testing results are available (option E).



[Q: 2725] OnExamination 2012 -
Haematology

Which of the following is the blood product with the highest risk of transmission of a

bacterial infection related to transfusion?

- 1- Cryoprecipitate
- 2- Fresh frozen plasma
- 3- Factor VIII concentrates
- 4- Packed red cells
- 5- Platelets

Answer & Comments

Answer: 5- Platelets

Since platelets are stored at room temperature (22°C), the risk of bacterial contamination is highest in this blood product (option E).

In contrast packed red cells are stored at an average of 4°C (option D) while fresh frozen plasma as well as cryoprecipitate are stored at - 20°C (options B and A).

Factor VIII concentrates are heat inactivated freeze dried products with a minimal risk of bacterial contamination (option C).



[Q: 2726] OnExamination 2012 -
Haematology

A pre-transfusion sample shows that a patient has blood group O.

This means that which of the following statements is correct?

- 1- The red cells have absent A /B antigen and plasma has anti A and anti B antibodies
- 2- The red cells have A /B antigen but no antibodies in the plasma
- 3- The red cells may have any antigen but plasma has anti A and anti B antibodies
- 4- The red cells have antigen A and plasma has antiB antibodies
- 5- The red cells have antigen B and plasma has A antibodies

Answer & Comments

Answer: 1- The red cells have absent A /B antigen and plasma has anti A and anti B antibodies

Option A is blood group O as it has no A or B antigen but has the corresponding antibodies

Option B represents blood group AB while

Options D and E represent groups A and B respectively.

Option C does not represent any blood group.



[Q: 2727] OnExamination 2012 - Haematology

Which of the following is a feature of haemoglobin S?

- 1- Has a higher affinity for oxygen than HbA
- 2- It is more negatively charged than HbA and as a result, less soluble
- 3- Is a result of a point mutation
- 4- It has the effect of shifting the oxygen dissociation curve to the left
- 5- It contains two α -like globins and two β -like globins and two haem molecules

Answer & Comments

Answer: 3- Is a result of a point mutation

HbS has the following properties:

It is less negatively charged than HbA (due to the loss of glutamate)

It polymerises with adjacent HbS

It is less soluble than HbA

It has lower affinity for oxygen (right-shift of the oxygen-dissociation curve), which improves the yield of oxygen to the tissues

It is the result of a point mutation.

Option A is incorrect because the statement is false. HbS has a lower affinity for oxygen,

which increases the risk of desaturation, but improves the yield of oxygen to the tissues.

Option B is incorrect because the statement is false. HbS is less negatively charged, due to the loss of glutamate for valine. The loss of the negative charge and the configuration of HbS makes it less soluble.

Option C is correct because the statement is true. HbS is the result of a point mutation substituting glutamate for valine at position 6.

Option D is incorrect because the statement is false. HbS shifts the oxygen dissociation curve to the right.

Option E is incorrect because the statement is false. It contains two α -like globins and two β -like globins and four haem molecules.



[Q: 2728] OnExamination 2012 - Haematology

Which of the following statements is true about the storage conditions and shelf life of blood products?

- 1- Fresh frozen plasma is stored at -30°C for up to 24 months
- 2- Fresh frozen plasma is stored at -30°C for 12 months
- 3- Packed red cells are stored at 4°C for up to 25 days
- 4- Platelets are stored at 22°C for up to 10 days
- 5- Platelets are stored at 4°C for up to five days

Answer & Comments

Answer: 1- Fresh frozen plasma is stored at -30°C for up to 24 months

Fresh frozen plasma can be stored up to 24 months at -30°C (hence option A is correct).

Red cells are stored at 4°C for up to 35 days and platelets at 22°C for five days on a platelet shaker/agitator (hence not options B, C, D and E).



[Q: 2729] OnExamination 2012 -
Haematology

A 32-year-old woman who has been admitted on two previous occasions with hypertension, agitation and severe abdominal pain is brought to the emergency department by her husband.

She has apparently hardly slept over the past few days, staying up all night working and then most recently drinking substantial amounts of alcohol.

On examination, her behaviour strikes you as hypomanic. She has a BP of 155/91 mmHg, and a pulse of 85. Her abdomen is soft, but is diffusely tender with active bowel sounds.

Investigations

Haemoglobin 12.8 g/dl(11.5-16.5)

White cells $11.3 \times 10^9/L$ (4-11)

Platelets $204 \times 10^9/L$ (150-400)

Sodium 131 mmol/l (135-146)

Potassium 4.4 mmol/l (3.5-5)

Creatinine 95 $\mu\text{mol/l}$ (79-118)

Which of the following is the most likely diagnosis?

- 1- Acute intermittent porphyria
- 2- Hypothyroidism
- 3- Irritable bowel syndrome
- 4- Manic depressive psychosis
- 5- Stimulant abuse

Answer & Comments

Answer: 1- Acute intermittent porphyria

Acute intermittent porphyria (AIP) should be considered in this type of patient, where there are intermittent symptoms characterised by repeated attacks of abdominal pain where no obvious cause is found.

Other features consistent with the diagnosis include

Agitation

Hypertension

Hyponatraemia

Mild leukocytosis.

A range of psychiatric symptoms, including hypomania and delirium may be seen.

Urinary porphobilinogen assay is the optimal way to establish the diagnosis.

Avoidance of precipitants, including alcohol and the oral contraceptive pill, can dramatically reduce the frequency of attacks.



[Q: 2730] OnExamination 2012 -
Haematology

An 18-year-old male presented with excessive bleeding following a tooth extraction.

His investigations showed:

Platelet count $260 \times 10^9/L$ (150-400)

Prothrombin time 13 s(11.5-15.5)

Activated partial thromboplastin time 86 s (30-40)

Factor VIII 110 IU/dl (50-150)

Deficiency of which of the following clotting factors is the most likely explanation for this patient?

- 1- II
- 2- V
- 3- VII
- 4- IX
- 5- X

Answer & Comments

Answer: 4- IX

An elevated APTT could be due to:

- * Treatment with heparin
- * Haemophilia

- * von Willebrand's disease
- * Antiphospholipid syndrome.

A normal factor VIII would suggest haemophilia B where there is lack of factor IX.

A prolonged APTT can be seen in von Willebrand's disease, but factor VIII activity would be low.

The presentation is not consistent with antiphospholipid syndrome and would also, typically, be associated with thrombocytopenia.



[Q: 2731] OnExamination 2012 - Haematology

A 17-year-old girl with mild von Willebrand's disease is scheduled for dental extraction. A previous dental extraction resulted in bleeding that had required two unit transfusion.

What is the most appropriate treatment prior to dental surgery?

- 1- Cryoprecipitate
- 2- DDAVP
- 3- Fresh frozen plasma
- 4- High purity factor VIII concentrate
- 5- Recombinant factor VIII concentrate

Answer & Comments

Answer: 2- DDAVP

DDAVP is the choice treatment for mild von Willebrand disease, which would include type I, and the majority of type II; although there is some controversy in type II B as it is thought that DDAVP can exacerbate thrombocytopenia that can accompany this type of von Willebrand's.

It is of no use in type III - severe von Willebrand's disease. The history tells us that she has mild disease.

You would not use cryoprecipitate or fresh frozen plasma in these patients in this era, due

to potential viral transmission risk from blood products.

For severe disease you would use a Von Willebrand factor concentrate, not factor VIII concentrate.



[Q: 2732] OnExamination 2012 - Haematology

Which of the following statements regarding thrombocytosis is correct?

- 1- Erythropoietin is the key hormone in the regulation of megakaryocyte differentiation
- 2- May occur as a response to exercise
- 3- Occurs exclusively in essential thrombocythaemia
- 4- Secondary thrombocytosis is an indication for hydroxycarbamide therapy
- 5- The most common cause is essential thrombocythaemia

Answer & Comments

Answer: 2- May occur as a response to exercise

The most common cause of thrombocytosis is a reactive thrombocytosis.

Thrombocythaemia may occur in any of the myeloproliferative disorders, particularly polycythaemia rubra vera (PRV).

Thrombopoietin is the key hormone in the regulation of megakaryocyte differentiation.

Secondary thrombocytosis does not place the patient at risk for haemostatic or cardiovascular events.



[Q: 2733] OnExamination 2012 - Haematology

A 60-year-old Chinese man has been started by his general practitioner on quinine for leg cramps.

He presents, a week later, with five days of darkened urine and two days of increasing breathlessness, back pain and fatigue.

Investigations show a haemoglobin of 7.0 g/dL (13.0-18.0) and raised reticulocyte count.

Which of the following best explain this drug reaction?

- 1- Autoimmune haemolytic anaemia
- 2- Glucose-6-phosphate dehydrogenase deficiency
- 3- Hereditary spherocytosis
- 4- Pyruvate kinase deficiency
- 5- Sickle cell disease

Answer & Comments

Answer: 2- Glucose-6-phosphate dehydrogenase deficiency

G6PDH (X linked recessive) is seen in African, Mediterranean, Iraqi, Jew, South East Asian and Chinese people and predisposes to a haemolytic anaemia reaction with drugs or infection.

Implicated drugs include

Aspirin

Sulphonamides

Antimalarials

Quinine/quinidine.

The haemolytic anaemia is non-immune (direct antiglobulin test [DAT] negative).

Pyruvate kinase deficiency is autosomal recessive and presents as a chronic haemolytic anaemia exacerbated by viral infections.

Hereditary spherocytosis is characterised by variable chronic non-immune haemolysis exacerbated by infections.

Further Reading G6PD.org



[Q: 2734] OnExamination 2012 - Haematology

A 70-year-old woman is on multiple medications for various conditions and she is found to have a macrocytic anaemia with a low serum B12.

Which of the following medications is a possible cause of the B12 deficiency?

- 1- Amiodarone
- 2- Ezetimibe
- 3- Metformin
- 4- Nicotinic acid
- 5- Sodium valproate

Answer & Comments

Answer: 3- Metformin

Metformin can lead to reduced B12 absorption but this is not usually a clinical problem.

"The clinician must be aware of the possibility of metformin-associated B12 deficiency in users who suffer cognitive impairment, peripheral neuropathy, subacute combined degeneration of the cord or anaemia." Age Ageing. 2006 Mar;35(2):200-1



[Q: 2735] OnExamination 2012 - Haematology

Which of the following conditions would be expected to be associated with a raised leukocyte alkaline phosphatase (LAP) score?

- 1- Chronic myeloid leukaemia
- 2- Infectious mononucleosis
- 3- Myelofibrosis
- 4- Pernicious anaemia
- 5- Thrombocytopenic purpura

Answer & Comments

Answer: 3- Myelofibrosis

The LAP score aids in the differential diagnosis of chronic myelocytic leukaemia (CML) versus leukaemoid reaction.

It also aids in the evaluation of:

Polycythaemia vera

Myelofibrosis with myeloid metaplasia, and

Paroxysmal nocturnal haemoglobinuria.

Low scores have been associated with:

CML

Paroxysmal nocturnal haemoglobinuria (PNH)

Thrombocytopenic purpura, and

Hereditary hypophosphatasia.

High scores have been seen in:

Polycythaemia vera

Myelofibrosis

Aplastic anaemia

Downs syndrome

Hairy cell leukaemia

Leukaemoid reactions and

Neutrophilia either physiological or secondary to infection.

It is also increased in Hodgkin disease. Read more



[Q: 2736] OnExamination 2012 - Haematology

A 45-year-old lady is found to have thymoma.

Which one of the following conditions is associated with thymoma?

- 1- Acute lymphocytic leukaemia
- 2- Acute myeloid leukaemia
- 3- Myelofibrosis
- 4- Pure red cell aplasia
- 5- Thrombocythaemia

Answer & Comments

Answer: 4- Pure red cell aplasia

"Originally, thymoma was cited as the primary cause of acquired pure red cell aplasia. However, subsequent studies revealed that thymomas caused only 2 of 37 cases of pure red cell aplasia. Conversely, only 7% of patients with thymomas had pure red cell aplasia. T-cell mediated erythroid rejection is considered the mechanism for the production of pure red cell aplasia in patients with thymomas. This is supported by evidence that a subgroup of T cells in B-cell chronic lymphocytic leukemia is responsible for pure red cell aplasia." eMedicine: Pure Red Cell Aplasia



[Q: 2737] OnExamination 2012 - Haematology

A 56-year-old man is found to have a macrocytic anaemia with a megaloblastic bone marrow.

Which of the following causes of macrocytosis is the most likely cause here?

- 1- Alcohol
- 2- Aplastic anaemia
- 3- Folate deficiency
- 4- Myelodysplasia
- 5- Reticulocytosis

Answer & Comments

Answer: 3- Folate deficiency

A megaloblastic bone marrow occurs in Vitamin B₁₂ or folate deficiency and with some cytotoxic drugs.

The other causes of macrocytosis do not cause a megaloblastic bone marrow appearance.



[Q: 2738] OnExamination 2012 -
Haematology

A 55-year-old gentleman presents to his GP with a six month history of lethargy and left upper quadrant abdominal discomfort.

A blood count shows a white cell count of $350 \times 10^9/L$, haemoglobin of 10.5 g/dL and a platelet count of $223 \times 10^9/L$. A bone marrow aspirate shows increased granulocytic precursors and less than 5% blasts. Molecular studies show the patient to be BCR-ABL transcript positive.

Which of the following is the most appropriate therapy?

- 1- Chemotherapy
- 2- Haemopoietic stem cell transplant
- 3- Hydroxycarbamide
- 4- Interferon
- 5- Treatment with tyrosine kinase inhibitor, for example, imatinib

Answer & Comments

Answer: 5- Treatment with tyrosine kinase inhibitor, for example, imatinib

The above presentation and laboratory findings are typical for chronic phase chronic myelogenous leukaemia (CML).

Option A (chemotherapy) is incorrect because chemotherapy is only used in the blast crisis phase of CML.

Options C and D are now outdated treatments for CML.

Option B (stem cell transplant) is not performed first in patients with CML since the advent of specifically targeted therapy for the BCR-ABL transcript positive leukaemias, that is, tyrosine kinase inhibitors, which are now the gold standard therapy for CML.

Hence option E is the correct answer.



[Q: 2739] OnExamination 2012 -
Haematology

A 25-year-old man presents with an enlarged inguinal lymph node with night sweats. The most likely clinical diagnosis is Hodgkin's lymphoma.

An excision biopsy of the lymph node is performed.

Which one of the following findings on histopathology is associated with the best prognosis in Hodgkin's disease?

- 1- Lymphocyte depleted
- 2- Lymphocyte predominant
- 3- Mixed cellularity
- 4- Nodular sclerosing
- 5- Reed-Sternberg cells

Answer & Comments

Answer: 2- Lymphocyte predominant

Hodgkin's disease is characterised by Reed-Sternberg cells and this is, therefore, not a prognostic feature.

Nodular sclerosing is the most common finding and has a good prognosis.

Mixed cellularity also has good prognosis.

Lymphocyte depleted has the worst prognosis.

The best prognosis is lymphocyte predominant.



[Q: 2740] OnExamination 2012 -
Haematology

A 16-year-old boy presents with a haemarthrosis that developed in his left knee following an injury in the garden.

His investigations show:

Platelet count $260 \times 10^9/L$ (150-400)

Prothrombin time 13 s(11.5-15.5)

Activated partial thromboplastin time 80 s(30-40)

Factor VIII 110 IU/dl(50-150)

Which of the following is the most likely diagnosis?

- 1- Antiphospholipid syndrome
- 2- Antithrombin III deficiency
- 3- Haemophilia A
- 4- Haemophilia B
- 5- von Willebrand's disease

Answer & Comments

Answer: 4- Haemophilia B

An elevated activated partial thromboplastin time (APTT) could be due to

Treatment with heparin

Haemophilia

von Willebrand's disease

Antiphospholipid syndrome.

A normal factor VIII would suggest haemophilia B where there is lack of factor IX.

A prolonged APTT can be seen in von Willebrand's disease but factor VIII activity would be low.

The presentation is not consistent with antiphospholipid syndrome which is associated with thrombosis rather than haemorrhage. Antithrombin III deficiency is also associated with thrombosis, and is most commonly acquired in the setting of nephrotic syndrome.



[Q: 2741] OnExamination 2012 - Haematology

Which of the following is the mechanism of action of warfarin?

- 1- Activation of gamma-glutamyl carboxylase
- 2- Chelation of calcium
- 3- Inhibition of activated factor X

4- Inhibition of vitamin K-dependent carboxylase

5- Inhibition of vitamin K epoxide reductase

Answer & Comments

Answer: 5- Inhibition of vitamin K epoxide reductase

The vitamin K epoxide is in turn recycled back to vitamin K and vitamin K hydroquinone by another enzyme, the vitamin K epoxide reductase (VKOR).

Warfarin inhibits epoxide reductase (specifically the VKORC1 subunit), thereby diminishing available vitamin K and vitamin K hydroquinone in the tissues which inhibits the carboxylation activity of the glutamyl carboxylase.

When this occurs, the coagulation factors are no longer carboxylated at certain glutamic acid residues, and are incapable of binding to the endothelial surface of blood vessels, and are thus biologically inactive.

More information



[Q: 2742] OnExamination 2012 - Haematology

A 78-year-old female who is on warfarin for atrial fibrillation presents with melaena.

Her blood pressure is 90/60 mmHg and heart rate is 100 bpm.

Investigations show:

Haemoglobin 9 g/l (12-16)

MCV 87 fl(83-95)

INR 7.2(<1.4)

A PR examination confirms melaena.

Which is the best option for correcting the coagulopathy?

- 1- FFP
- 2- IV vitamin K
- 3- Stop warfarin

4- Stop warfarin and give IV vitamin K

5- Stop warfarin and give IV vitamin K and prothrombin complex concentrate

Answer & Comments

Answer: 5- Stop warfarin and give IV vitamin K and prothrombin complex concentrate

This patient is hypotensive and tachycardic with melaena suggesting a major bleeding episode on warfarin.

In these circumstances current guidelines suggest stopping warfarin, giving IV vitamin K, and either fresh frozen plasma (FFP) or prothrombin complex concentrate.

Local guidelines will be available and if in doubt consult with the haematologist on call. FFP may not completely reverse the effects of warfarin so it may now be preferable to consider prothrombin complex concentrate (PCC) if available.

The rate of fatal haemorrhage in patients receiving warfarin approaches 1%. It is therefore essential that knowledge regarding the reversal of warfarin coagulation is serviceable.



[Q: 2743] OnExamination 2012 - Haematology

A 12-year-old boy was diagnosed with haemophilia A.

His uncle on his mother's side also has the same condition although his mother is well. The parents of the boy are worried about their next child suffering with the same condition.

What is the chance of the next child having the disease?

1- 0%

2- 25%

3- 50%

4- 75%

5- 100%

Answer & Comments

Answer: 2- 25%

Haemophilia is an X linked recessive disease.

The mother is the carrier of the disease.

There will be 50% chance of her sons having the disease and there is a 50% chance of her daughters being carriers.

The sex of the next child it is not mentioned in this question. The overall chance of the next child having the disease will be 25% and phenotypically normal child will be 75%.



[Q: 2744] OnExamination 2012 - Haematology

A patient with AML develops jaundice and spiking pyrexia three weeks into induction chemotherapy.

The patient remained pyrexial after seven days of intravenous antibiotics.

What is the likely diagnosis?

1- CMV

2- Fungal infection

3- Hepatic leukaemic deposits

4- Miliary TB

5- Toxoplasmosis

Answer & Comments

Answer: 1- CMV

The most likely cause for the persisting pyrexia plus hepatitis in this immunocompromised patient treated with appropriate antibiotics would be a Cytomegalovirus (CMV) infection.

Fungal infection would not be expected to cause the jaundice but again may be responsible for the pyrexia.

TB would be most unlikely and hepatic infiltration would not be expected to produce this pyrexia.



[Q: 2745] OnExamination 2012 -
Haematology

A 16-year-old girl presents with bilateral cervical lymphadenopathy. Her lymph node biopsy reveals a nodular sclerosing Hodgkin's disease.

Which one of the following features indicates a poorer prognosis?

- 1- Fatigue
- 2- Mediastinal mass of 3 cm
- 3- Night sweats
- 4- Pruritis
- 5- Recent Epstein-Barr virus infection

Answer & Comments

Answer: 3- Night sweats

Important prognostic features in Hodgkin's disease (HD) are stage B symptoms:

Fever

Night sweats

Weight loss.

A mass of > 10 cm in size is also a poor prognostic factor.

Therefore although fatigue and pruritus are common, they have no prognostic significance.

EBV infection commonly is associated with HD but has no prognostic significance.



[Q: 2746] OnExamination 2012 -
Haematology

A 40-year-old man presents with bleeding gums and ease of bruising. His only medication is omeprazole for dyspepsia.

Investigations show:

Haemoglobin 12.5 g/dL (13.0-18.0)

MCV 90 fL (80-96)

Platelets $20 \times 10^9/L$ (150-400 $\times 10^9$)

Prothrombin time 13.5s (11.5-15.5)

Blood film: occasional giant platelets

What is the most likely diagnosis?

- 1- Amegakaryocytic thrombocytopenia
- 2- Disseminated intravascular coagulation
- 3- Drug-induced thrombocytopenia
- 4- Immune thrombocytopenia
- 5- Thrombotic thrombocytopenic purpura

Answer & Comments

Answer: 4- Immune thrombocytopenia

The only abnormality is the very low platelet count.

The bone marrow is still working as there are giant platelets seen on film, which you see when there is peripheral consumption of the platelets.

The large platelets are a sign that the bone marrow is churning them out prematurely to keep up with demand.

With disseminated intravascular coagulation the prothrombin time would be prolonged.

With thrombotic thrombocytopenic purpura the haemoglobin would be low- as haemolysis is a feature.

Drug-induced thrombocytopenia in itself is an immune mechanism, and while lansoprazole can cause a reduction in platelet count, it is not classically a drug you associate with drug induced thrombocytopenia.

Immune thrombocytopenia is very common and would give this very low platelet count, and by choosing this answer it covers drug induced thrombocytopenia as well.



[Q: 2747] OnExamination 2012 -
Haematology

A 75-year-old woman receives two units of packed red cells following a hip replacement.

One week later her haemoglobin concentration had fallen by 4 g/l.

Which one of the following would be most likely to indicate a delayed transfusion reaction?

- 1- Conjugated hyperbilirubinaemia
- 2- Elevated D dimer concentration
- 3- Haemoglobinuria
- 4- Haemosiderinuria
- 5- Positive direct antiglobulin test

Answer & Comments

Answer: 5- Positive direct antiglobulin test

The features suggest immune haemolysis with direct antiglobulin test (DAT) being diagnostic.

A. Is inappropriate as it is unconjugated bilirubin that is raised in haemolysis.

B, C and D. Are not going to be diagnostic of an immune haemolytic transfusion reaction.



[Q: 2748] OnExamination 2012 - Haematology

Which of the following statements regarding disseminated intravascular coagulation (DIC) is most correct?

- 1- DIC is associated with a rising platelet count
- 2- DIC is associated with an elevated D-dimer
- 3- DIC is associated with rising fibrinogen levels
- 4- Normal clotting parameters effectively exclude a diagnosis of DIC
- 5- Removal of the underlying cause of the DIC will lead to resolution of the manifestations of DIC

Answer & Comments

Answer: 2- DIC is associated with an elevated D-dimer

DIC is caused by the enhanced and abnormally sustained generation of thrombin, and is associated with elevated products of fibrin breakdown, one of these being D-dimer.

Treatment of the underlying cause, for example, sepsis, does not always lead to resolution of the condition, and recombinant human activated protein C has been shown to be effective in reducing mortality from DIC in patients with sepsis.

DIC is associated with a falling platelet count and decreased fibrinogen, but the clotting factors may be normal, especially when one considers that the acute phase response may shorten the activated partial thromboplastin time (APTT) and increase fibrinogen.

For an excellent review see BMJ 2003;327:974-7.



[Q: 2749] OnExamination 2012 - Haematology

A 45-year-old woman being treated for acute myeloid leukaemia fails to get sufficient rises with platelet transfusions.

She is 14 days post chemotherapy, afebrile and apart from minor bruising is otherwise well.

Which of the following would be the next best step in the management of platelet refractoriness?

- 1- Avoid further platelet transfusions
- 2- Continue to monitor for platelet rises with random platelets
- 3- Check for a one hour post platelet transfusion platelet count
- 4- Prescribe HLA matched platelets
- 5- Request directed platelet donations

Answer & Comments

Answer: 3- Check for a one hour post platelet transfusion platelet count

Patients who are refractory to platelet transfusions should first be investigated to check for adequate platelet rises - best done on a one or two hour post platelet transfusion sample (option C).

Further management would include checking for HLA antibodies but requesting HLA matched platelets at this stage would not be appropriate (hence not option D).

Continuing random platelet transfusions or requesting a directed platelet donation are also not appropriate at this stage (options B and E).

Platelets are obviously indicated in this patient until recovery of blood counts and hence cannot be avoided (option A).



[Q: 2750] OnExamination 2012 - Haematology

A 42-year-old man presented with tiredness, breathlessness and nose bleeds for three weeks. On examination there were several bruises on his arms and legs, 2 cm splenomegaly and fundal haemorrhages.

Investigations revealed:

Haemoglobin 7.2 g/dl (13.0-18.0)

White cell count $13.8 \times 10^9/L$ (4-11)

Platelet count $24 \times 10^9/L$ (150-400)

Blood film White cells predominantly myeloblasts and promyelocytes

Which one of the following investigations would be of most prognostic value?

- 1- Bone marrow trephine biopsy
- 2- Cerebrospinal fluid examination
- 3- Cytochemistry
- 4- Cytogenic karyotype
- 5- Immunophenotyping

Answer & Comments

Answer: 4- Cytogenic karyotype

Cytogenetic evaluation of malignant haematological cells may have important implications for the prognosis and treatment options in acute myelogenous leukaemia (AML).

For example t(8;21) confers a good prognosis in adult AML, and about 70% of patients in this low-risk group can be cured with intensive chemotherapy alone, radiotherapy being reserved for patients who relapse.



[Q: 2751] OnExamination 2012 - Haematology

A 60-year-old male presents with bruising and tiredness.

Examination reveals four finger breadth splenomegaly and his results reveal:

Haemoglobin 11 g/dL (13.0-18.0)

White cell count $100 \times 10^9/L$ (4-11 $\times 10^9$)

Platelets $900 \times 10^9/L$ (150-400 $\times 10^9$)

Blood film reveals a neutrophilia, basophilia, numerous myelocytes and 4% myeloblasts.

Which of the following is likely to be present in this patient?

- 1- BCR-ABL gene fusion only
- 2- Deletion 11q13
- 3- Deletion chromosome 13
- 4- Normal chromosomal analysis
- 5- Translocation 9;22

Answer & Comments

Answer: 5- Translocation 9;22

The Philadelphia chromosome (translocation 9;22) is present in approximately 90% of subjects with chronic myelocytic leukaemia (CML).

The molecular consequences of this translocation is the generation of the fusion bcr-abl gene which creates an abnormal protein stimulating white cell growth. Only 5%

of cases have the bcr-abl fusion gene only without the typical Philadelphia chromosome.

Deletion of Ch13 is associated with a poorer prognosis in multiple myeloma.



[Q: 2752] OnExamination 2012 - Haematology

Whilst being investigated for infertility, a 30-year-old woman is noted to have some bruising on her limbs with a palpable spleen on abdominal examination.

Investigations reveal:

Haemoglobin 10.0 g/dL (11.5-16.5)

White cell count $110 \times 10^9/L$ (4-11 $\times 10^9$)

Neutrophils $60 \times 10^9/L$ (1.5-7 $\times 10^9$)

Lymphocytes $2 \times 10^9/L$ (1.5-4 $\times 10^9$)

Monocytes $0.8 \times 10^9/L$ (0-0.8 $\times 10^9$)

Eosinophils $0.3 \times 10^9/L$ (0.04-0.4 $\times 10^9$)

Basophils $0.7 \times 10^9/L$ (0-0.1 $\times 10^9$)

Myelocytes $40 \times 10^9/L$

Myeloblasts $4 \times 10^9/L$

Platelet count $900 \times 10^9/L$ (150-400 $\times 10^9$)

What is the most likely diagnosis?

- 1- Acute myeloid leukaemia
- 2- Acute promyelocytic leukaemia
- 3- Chronic myeloid leukaemia
- 4- Essential thrombocythaemia
- 5- Myelofibrosis

Answer & Comments

Answer: 3- Chronic myeloid leukaemia

The features of this blood film are anaemia, thrombocytosis, neutrophilia with roughly 55% neutrophils, 40% myelocytes with less than 5% blast cells.

This is typical of chronic myeloid leukaemia which usually has associated tender

splenomegaly. Usually the Philadelphia chromosome is present in 95% of cases.

Acute leukaemia is defined as blast cells constituting over 30% of cell type present.

Chronic myeloid leukaemia often ends in acute blastic transformation after a mean duration of approximately four years.



[Q: 2753] OnExamination 2012 - Haematology

An 80-year-old woman has a three month history of progressive numbness and unsteadiness of her gait.

On examination, there is a mild spastic paraparesis, with brisk knee reflexes, ankle reflexes are present with reinforcement, extensor plantars, sensory loss in the legs with a sensory level at T10, impaired joint position sense in the toes, and loss of vibration sense below the iliac crests.

Investigations were as follows:

Haemoglobin 12.2 g/dL (12-16)

MCV 95 fL (80-96)

What is the most likely diagnosis?

- 1- Anterior spinal artery occlusion
- 2- Dorsal meningioma
- 3- Multiple sclerosis
- 4- Subacute combined degeneration of the cord
- 5- Tabes dorsalis

Answer & Comments

Answer: 2- Dorsal meningioma

The presence of a sensory loss at T10 indicates a thoracic myelopathy.

Subacute combined degeneration of the cord is unlikely as the haemoglobin concentration and mean corpuscular volume (MCV) are normal.

Anterior spinal artery occlusion is unlikely as the history is progressive and chronic.



[Q: 2754] OnExamination 2012 - Haematology

Which of the following is a feature of hereditary haemorrhagic telangiectasia?

- 1- A good response to oestrogen therapy
- 2- Cerebral arteriovenous malformations
- 3- GI haemorrhage is the usual presenting feature
- 4- Telangiectasia of the mucous membranes, but not the skin
- 5- Tendency of lesions to become less obvious with age

Answer & Comments

Answer: 2- Cerebral arteriovenous malformations

Hereditary haemorrhagic telangiectasia (HHT) is a multisystem vascular dysplasia characterised by the presence of multiple arteriovenous malformations (AVMs) that lack intervening capillaries and result in direct connections between arteries and veins. Small AVMs, called telangiectases, close to the surface of skin and mucous membranes often rupture and bleed. It is inherited as an autosomal dominant trait.

The most common clinical manifestations of HHT are spontaneous and recurrent epistaxis and multiple telangiectases, which commonly appear on the lips, face, tongue or hands in adulthood. A minority of individuals with HHT have symptomatic gastrointestinal (GI) bleeding, which most commonly begins after age 50 years. Large AVMs often cause symptoms when they occur in the brain or lung; complications from bleeding or shunting may be sudden and catastrophic. It is estimated at least 30% of HHT patients have pulmonary involvement, 30% hepatic

involvement and 10-20% cerebral involvement.

The manifestations of HHT generally develop with age, and are usually not present at birth. Epistaxis is usually the earliest sign of disease, often occurring in childhood. Pulmonary AVMs can become apparent from puberty. By the age of 16 years 71% of patients will have developed signs of HHT, rising to over 90% by 40 years.

The Curacao criteria can be used to aid diagnosis:

The diagnosis is:

- Definite if three criteria are present.
- 'Possible' or 'suspected' if two criteria are present
- 'Unlikely' if fewer than two criteria are present

Criteria:

- Epistaxis: spontaneous, recurrent nose bleeds
- Telangiectases: multiple, characteristic sites (lips, oral cavity, fingers, nose)
- Visceral lesions, such as gastrointestinal telangiectasia, pulmonary AVM, hepatic AVM, cerebral AVM, spinal AVM
- Family history of a first degree relative with HHT

Cerebral involvement can be in the form of telangiectasias, cerebral AVMs, aneurysms or cavernous angiomas. Cerebral AVMs are thought to affect 10% of patients, and can result in headaches, seizures, surrounding ischaemia (steal) or haemorrhage. These lead to significant mortality and morbidity.

Management of epistaxis and gastrointestinal haemorrhage should be symptomatic initially. Whilst it is generally regarded that pulmonary AVMs should be screened for (and treated with prophylactic antibiotics and

embolisation), screening for cerebral and hepatic AVMs remains controversial and is not currently offered in the UK. Oestrogen therapy is sometimes advocated but their efficacy is unclear. They may be beneficial in heavily transfusion dependent patients.



[Q: 2755] OnExamination 2012 -
Haematology

An 18-year-old Asian female is noted by her dentist to have gingival hypertrophy.

Which of the following is most likely to be responsible for her presentation?

- 1- Carbamazepine
- 2- Lead poisoning
- 3- Phenytoin
- 4- Scurvy
- 5- Sodium valproate

Answer & Comments

Answer: 3- Phenytoin

The inclusion of 'Asian' descent in this question is intended as a distractor.

Gum hypertrophy may be seen in conditions such as acute myeloid leukaemias and with drugs such as phenytoin.

Scurvy (vitamin C deficiency) is associated with bleeding gums.

Lead toxicity is associated with pigmentation of the gingiva.

Carbamazepine is not associated with gingival hyperplasia but recognised side effects include ataxia, drowsiness and blood dyscrasias.



[Q: 2756] OnExamination 2012 -
Haematology

A 68-year-old woman was admitted to hospital with severe acute dyspnoea. She denied having any chest pain but said that she

had become progressively breathless over the past three months.

On examination her pulse was 120 beats per minute and regular. Her blood pressure was 95/55 mmHg and her jugular venous pressure was elevated to the angle of the jaw. Her heart sounds were normal. Auscultation of her chest revealed bilateral fine inspiratory crackles to the mid zones. She had haemorrhages in both fundi.

Investigations revealed:

Haemoglobin 5.6 g/dL(11.5-16.5)

Haematocrit 0.19(0.36-0.47)

MCV 118 fL(80-96)

MCH 33.0 pg(28-32)

White cell count $3.4 \times 10^9/L$ (4-11)

Platelets $95 \times 10^9/L$ (150-400)

Serum Vitamin B₁₂ Result pending

Serum folate Result pending

The electrocardiogram (ECG) showed left bundle branch block, which had been documented previously.

She is given 80 mg of intravenous furosemide which results in an excellent diuresis.

What is the next most appropriate immediate step in her management?

- 1- Blood transfusion
- 2- Bone marrow aspiration
- 3- Start intramuscular Vitamin B₁₂ and oral folic acid
- 4- Start oral ferrous sulphate
- 5- Thrombolyse with t-PA

Answer & Comments

Answer: 1- Blood transfusion

The clinical picture represents severe megaloblastic anaemia with cardiac failure.

The questions asks about immediate management. Although the anaemia has been

developing slowly, she has become acutely haemodynamically compromised. In such circumstances it would be most appropriate to transfuse the patient. This would need to be done very cautiously with diuretic cover.

She will clearly need to start an intensive course of intramuscular Vitamin B₁₂ and oral folic acid as well, but this is less important in the hyperacute situation where there is a risk of the patient dying from anaemia.

Giving oral folic acid without Vitamin B₁₂ would be hazardous and could precipitate subacute combined degeneration of the spinal cord. Transfusion may also be hazardous in a patient with severe cardiac congestive failure (CCF).



[Q: 2757] OnExamination 2012 - Haematology

Heinz bodies in red blood cells in haemolytic anaemia are present in which of the following?

- 1- Clostridium welchii septicaemia
- 2- Cold agglutinin disease
- 3- Glucose 6 phosphate dehydrogenase deficiency
- 4- Paroxysmal nocturnal haemoglobinuria
- 5- Post splenectomy

Answer & Comments

Answer: 3- Glucose 6 phosphate dehydrogenase deficiency

Heinz bodies are oxidised denatured Hb.

Post splenectomy causes:

Target cells

Pappenheimer bodies (siderotic granules) and

Howell-Jolly bodies (DNA remnants).



[Q: 2758] OnExamination 2012 - Haematology

A 20-year-old Caucasian student returns from Ghana with a spiking temperature and nocturnal sweats. She has 0.5% of red blood cells infected with Plasmodium falciparum.

Select one of the following answers relating to quinine therapy in this case.

- 1- Glucose levels should be monitored in those being treated with quinine
- 2- Pregnancy is a contraindication for quinine
- 3- Quinine is contraindicated in those taking mefloquine prophylactically
- 4- Quinine must always be given parenterally initially
- 5- The dose of quinine should be reduced in liver impairment

Answer & Comments

Answer: 1- Glucose levels should be monitored in those being treated with quinine

Severe malaria is indicated by more than 1% of RBC infected.

Hypoglycaemia is an important side effect of quinine therapy and should be monitored in those having intravenous quinine.

Intravenous infusion of quinine is reserved for severe or cerebral malaria (most deaths from M. falciparum occur in first 96 hours of starting treatment).

The initial dose should not be reduced in those severely ill with renal/hepatic impairment.

High doses of quinine in pregnancy are teratogenic in the first trimester. However in malaria, the benefit of treatment outweighs the risk. Current WHO Guidelines (2006) recommend artemisinins are first line in the second and third trimester. In the first trimester, both artesunate and quinine are considered treatment options. In severe

malaria, any available treatment should be started without delay as both the mother and foetus' life are in danger.



[Q: 2759] OnExamination 2012 - Haematology

A 56-year-old female presents at the general practitioner with weakness.

A full blood count (FBC) reveals a haemoglobin concentration of 10.5 g/dL (11.5-16.5) and a mean cell volume (MCV) of 104 fL (80-96), but no other abnormality.

Which of the following may account for this?

- 1- Hormone replacement therapy (HRT)
- 2- Scurvy
- 3- Thyrotoxicosis
- 4- Ulcerative colitis
- 5- Zollinger-Ellison syndrome

Answer & Comments

Answer: 2- Scurvy

This is a tricky question. However, if you bear in mind this patient's symptoms and her FBC you should come to the correct conclusion.

She has weakness and in association with a mild anaemia and her increased MCV a vitamin C deficiency is most probable. Anaemia of this level should not cause weakness in itself.

Scurvy should not be thought of as a disease of the past, as cases continue to be diagnosed in children and adults. Clinical manifestations vary, and can be seen within 8-12 weeks of irregular or inadequate dietary intake. The early stages are characterised by malaise, fatigue and lethargy. Continued deficiency leads to anaemia, myalgia, bone pain, bruising, petechial and perifollicular haemorrhages, corkscrew hairs, gum disease, poor wound healing and mood changes. Late stages can lead to generalised oedema, severe jaundice, haemolysis, haemorrhage,

neuropathy, convulsions and death. Treatment for scurvy is vitamin C supplementation, and recovery is usually complete within three months.

HRT can affect folate storage and absorption, but not usually to an extent to cause these biochemical changes. is more likely to be associated with iron (Fe) deficiency anaemia as is Zollinger-Ellison syndrome and ulcerative colitis are both associated with iron-deficiency anaemia, and therefore a microcytosis.

Hypothyroidism, not thyrotoxicosis, is associated with macrocytosis.



[Q: 2760] OnExamination 2012 - Haematology

A mild lymphocytosis of $15 \times 10^9/L$ with a few smear cells is reported on a full blood count result in a 70-year-old asymptomatic man attending clinic for an annual review.

Which of the following would be the most essential investigation to establish a diagnosis of chronic lymphocytic leukaemia (CLL)?

- 1- CT scan of chest abdomen and pelvis
- 2- Lactic dehydrogenase (LDH) levels
- 3- Presence of smear cells on the blood film
- 4- Presence of palpable cervical lymphadenopathy
- 5- Peripheral blood flow cytometry

Answer & Comments

Answer: 5- Peripheral blood flow cytometry

Flow cytometry (option E) showing a specific pattern of monoclonal B cell proliferation (CD19/5 coexpressing, CD23 positive, light chain restricted B cell population) is diagnostic of CLL.

CT scan (option A) and LDH (option B) are investigations needed to complete staging but not essential for diagnosis.

Smear cells (option C) are reported in other lymphoproliferative as well as benign lymphocytosis and merely indicate fragile lymphocytes which are artefactually smeared on the glass slide.

Cervical lymphadenopathy (option D) may be seen in CLL but can also be seen in any other cause of lymphadenopathy (for example, viral infections, adenopathy secondary to local dental infection).



[Q: 2761] OnExamination 2012 - Haematology

A 19-year-old woman presents for the third time in the past eight months with acute abdominal pain and severe agitation. On the two previous occasions she was admitted by the surgeons and discharged without significant intervention.

She has started the oral contraceptive pill within the last year. According to her mother the local GP has considered medicating her because of increasing anxiety.

On examination her BP is 155/82 mmHg, pulse is 90 and regular, BMI 22. Her abdomen is generally tender although there are active bowel sounds.

Investigations show:

Haemoglobin 12.0 g/dl(11.5-16.0)

White cell count $9.3 \times 10^9/L$ (4-11)

Platelets $182 \times 10^9/L$ (150-400)

Sodium 135 mmol/l (135-146)

Potassium 3.9 mmol/l (3.5-5)

Creatinine 92 micromol/l (79-118)

You give her opiates for pain.

Which of the following is the most important additional therapy during this acute attack?

- 1- IV cefuroxime and metronidazole
- 2- IV glucose
- 3- Oral chlorpromazine
- 4- Oral diazepam

5- Oral propranolol

Answer & Comments

Answer: 2- IV glucose

The history of three recent attacks of acute anxiety and abdominal pain coupled with starting the oral contraceptive pill, raises the possibility of acute intermittent porphyria. Use of IV or oral glucose during an attack can lead to more rapid resolution of symptoms, as such that would be the favoured approach here. The pill should of course be withdrawn if possible.

There is no indication of acute sepsis, so use of IV antibiotics is inappropriate.

Phenothiazines may be used for restlessness, nausea and anxiety, and beta blockers have a role in the management of sympathetic activation.

It is glucose however that will have most impact in shortening the duration and severity of symptoms.



[Q: 2762] OnExamination 2012 - Haematology

Which of the following chemotherapeutic agents inhibits topoisomerase?

- 1- Bleomycin
- 2- Cisplatin
- 3- Docetaxel
- 4- Etoposide
- 5- Vincristine

Answer & Comments

Answer: 4- Etoposide

The topoisomerase inhibitors are a major class of chemotherapeutic agents and work by arresting the cell in S phase, and thereby inducing apoptosis.

Etoposide inhibits DNA topoisomerase II, thereby inducing errors in DNA synthesis at the pre-mitotic stage of cell division.

Bleomycin binds directly to DNA, inducing strand breaks and therefore degradation.

Cisplatin cross-links DNA, activating several signal transduction pathways which culminate in cell apoptosis.

Docetaxel prevents microtubule disassembly, and therefore limits the amount of free tubulin available for cell replication.

Vincristine is a vinca alkaloid, which inhibits microtubule formation during metaphase of mitosis.



[Q: 2763] OnExamination 2012 - Haematology

Mutation in codon 12 of the Ras oncogene often results in which of the following?

- 1- Decreased GTP binding
- 2- Decreased GTP hydrolysis
- 3- Increased GTP binding
- 4- Increased GTP hydrolysis
- 5- Increased interaction with SOS

Answer & Comments

Answer: 2- Decreased GTP hydrolysis

The Ras family of oncogenes are important intracellular signalling proteins which transmit signals from receptor tyrosine kinase proteins in the cell membrane down to the nucleus.

Ras is controlled by the activity of a GTPase binding site; when guanosine triphosphate (GTP) is bound Ras is active and it slowly hydrolyses the GTP to guanosine diphosphate (GDP) resulting in an inactive state.

Mutations in codon 12 result in decreased GTPase activity and a Ras protein which is 'always on' resulting in increased proliferation of the cell.



[Q: 2764] OnExamination 2012 - Haematology

A 40-year-old woman with early breast cancer is referred to the oncology clinic for consideration of radiotherapy to her breast following wide local excision.

What is the role of adjuvant radiotherapy in this case?

- 1- To improve wound healing
- 2- To increase overall survival
- 3- To reduce keloid scarring
- 4- To reduce local recurrence
- 5- To reduce skin metastasis

Answer & Comments

Answer: 4- To reduce local recurrence

Adjuvant radiotherapy is given after wide local excision of a breast tumour to reduce the risk of local recurrence; following meta-analysis there is no increased survival benefit largely due to complications of radiotherapy treatment.

Radiotherapy does improve the appearance of scars and can reduce keloid scarring but it is only rarely given for this indication.



[Q: 2765] OnExamination 2012 - Haematology

Which tumour marker is most commonly raised in ovarian cancers?

- 1- AFP
- 2- Beta-HCG
- 3- CA125
- 4- CA19-9
- 5- CEA

Answer & Comments

Answer: 3- CA125

CEA is used to monitor colorectal and breast carcinoma

CA19-9 is used primarily to monitor pancreatic carcinoma response

Beta-HCG and AFP are used to monitor testicular carcinoma, and are also raised in germ cell tumours of the ovary

AFP by itself is useful in monitoring liver carcinoma

CA125 is most commonly used to monitor epithelial ovarian carcinoma but can also be raised in endometrial, lung, breast and gastrointestinal carcinoma.



[Q: 2766] OnExamination 2012 - Haematology

A 60-year-old woman presents with a gradual onset of lumbar spine pain over the past two weeks associated with a gradual deterioration in her mobility. She has a past history of metastatic breast cancer to her bones currently controlled on anastrozole.

An emergency MRI reveals widespread metastatic deposits in her spine with encroachment at L2 causing a moderate degree of spinal cord compression.

What is the best course of action?

- 1- Emergency chemotherapy
- 2- Emergency radiotherapy
- 3- Emergency surgical decompression
- 4- Emergency surgical decompression and chemotherapy
- 5- Emergency surgical decompression and radiotherapy

Answer & Comments

Answer: 5- Emergency surgical decompression and radiotherapy

Spinal cord compression is a devastating complication of metastatic disease which needs to be treated promptly.

The patient needs to be nursed in bed and given high dose steroids until the MRI result is known.

Surgical decompression is best for expansile soft tissue masses which have fractured the bone and are forcing this against the spinal cord. This should then be followed up by post-operative radiotherapy to reduce the soft tissue component.

Chemotherapy has no role in spinal cord compression from breast cancer; it is used in highly chemotherapy-responsive tumours such as germ cell malignancies and lymphoma.



[Q: 2767] OnExamination 2012 - Haematology

A 60-year-old woman presents with a gradual onset of lumbar spine pain over the past two weeks associated with a gradual deterioration in her mobility. She has a past history of metastatic breast cancer to her bones currently controlled on anastrozole.

An emergency MRI reveals widespread metastatic deposits in her spine with encroachment at L2 causing a moderate degree of spinal cord compression.

What is the best course of action?

- 1- Emergency chemotherapy
- 2- Emergency radiotherapy
- 3- Emergency surgical decompression
- 4- Emergency surgical decompression and chemotherapy
- 5- Emergency surgical decompression and radiotherapy

Answer & Comments

Answer: 5- Emergency surgical decompression and radiotherapy

Spinal cord compression is a devastating complication of metastatic disease which needs to be treated promptly.

The patient needs to be nursed in bed and given high dose steroids until the MRI result is known.

Surgical decompression is best for expansile soft tissue masses which have fractured the bone and are forcing this against the spinal cord. This should then be followed up by post-operative radiotherapy to reduce the soft tissue component.

Chemotherapy has no role in spinal cord compression from breast cancer; it is used in highly chemotherapy-responsive tumours such as germ cell malignancies and lymphoma.



[Q: 2768] OnExamination 2012 - Haematology

A 25-year-old man is diagnosed with a testicular seminoma and treated with BEP chemotherapy.

His staging CT scan reveals para-aortic lymphadenopathy and he is referred from the multi-disciplinary meeting for external beam radiotherapy.

He is admitted after his third fraction of radiotherapy with severe community acquired pneumonia and isolated in a lead-lined side-room on an oncology ward.

Unfortunately he deteriorates and you are fast-bleeped to attend as he is peri-arrest due to impending respiratory failure.

What radiation precautions should you take before entering the room?

- 1- Consult the local rules for radiation protection
- 2- Do not enter the room unless the patient arrests
- 3- None
- 4- Wear a disposable apron and gloves
- 5- Wear a lead-lined apron and disposable gloves

Answer & Comments

Answer: 3- None

Much confusion surrounds the use of radiotherapy, especially how patients are cared for on the ward.

It is critical to distinguish between whether the patient has had external beam radiotherapy, brachytherapy or use of an unsealed source.

External beam radiotherapy or use of targeted intraoperative radiotherapy does not render the patient radioactive.

Use of brachytherapy methods can involve insertion of radioactive seeds or beads which may require some radiation protection precautions depending on the site.

Use of an unsealed source, for example radioiodine treatment of thyroid cancer, has substantial need for precautions and patients need to be isolated in a lead-lined side room, often for several days.

In this case the patient is not radioactive and needs emergency care immediately. It is likely he is in a lead-lined side room as this is the only room available on the ward - it has no bearing on whether he is radioactive or not.



[Q: 2769] OnExamination 2012 - Haematology

Small molecule kinase inhibitors for cancer:

A 44-year-old woman presents to the clinic with increasing lethargy and fatigue. She has been treated previously with interferon alpha and has a diagnosis of chronic myeloid leukaemia.

Her white blood cell count has risen to 22×10^3 cells per microlitre, and she is anaemic with a recent haemoglobin of 8.9 g/dl.

You decide to start her on imatinib.

Which of the following correctly describes the mode of action of imatinib?

- 1- Bcr-abl tyrosine kinase inhibitor
- 2- Epidermal growth factor receptor (EGFR) kinaseinhibitor
- 3- Fibroblast growth factor receptor inhibitor
- 4- HER2 receptor inhibitor
- 5- Vascular endothelial growth factor (VEGF)inhibitor

Answer & Comments

Answer: 1- Bcr-abl tyrosine kinase inhibitor

The answer is A, Bcr-abl tyrosine kinase inhibitor.

In chronic myeloid leukaemia (CML) this particular kinase is stuck chronically in the "on" position.

By targeting the kinase, imatinib inhibits the unregulated cell division which occurs in CML and can maintain many patients in remission for a number of years.

There is also a role for imatinib in the treatment of gastrointestinal stromal tumours, where targeting of Bcr-abl tyrosine kinase has been shown to impact on progression of tumour size.

Other small molecules used in the treatment of cancer include trastuzumab which targets the human epidermal growth factor 2, used in the treatment of breast cancer, and sunitinib, which inhibits multiple kinases which are stimulated by agonism of a number of receptors including VEGF receptors, RET and platelet-derived growth factor (PDGF) receptors.

SUTENT:

http://www.medicines.org.uk/emc/medicine/18531#PHARMACODYNAMIC_PROPS

Herceptin:

http://www.medicines.org.uk/emc/medicine/3567#PHARMACODYNAMIC_PROPS

GLIVEC:

<http://www.medicines.org.uk/emc/medicine/15014>



[Q: 2770] OnExamination 2012 - Haematology

Approximately 1% of pregnant women develop clinically important red cell antibodies, the most common being rhesus antibodies.

The women negative for D antigen develop antibodies on exposure to D positive blood (such as fetomaternal haemorrhage, abortions and transfusions).

This increases the risk of haemolytic disease of the newborn (HDN) in subsequent pregnancies.

From the following, choose the correct statement about rhesus antibodies in pregnancy:

- 1- D positive women are less likely than D negativewomen to form antibodies to other red cell antigens (such as Kelland Duffy)
- 2- Following delivery, the degree of FMH should be calculated on a blood sample from a D negative mother
- 3- Maternal antibody titres do not predict haemolytic disease of new born
- 4- Pregnant women should be checked for antibodies at 28 weeks as fetomaternal haemorrhage (FMH) occurs only after the second trimester.
- 5- The fetal Rh type is not dependent on the paternal Rh grouping

Answer & Comments

Answer: 2- Following delivery, the degree of FMH should be calculated on a blood sample from a D negative mother

Following delivery, the degree of FMH should be calculated on a blood sample from a D

negative mother to adjust the dose of antiD in the D negative mother delivering a D positive child (option B).

D positive women and D negative women have the same chances of developing antibodies to other red cell antigens.

All pregnant women should have a blood group and antibody screen in their first trimester or at presentation, whichever is earlier (option D).

The fetal Rh type depends on the paternal and maternal Rh typing (option E).

Maternal antibody titres correlate with the degree of HDN.



[Q: 2771] OnExamination 2012 - Haematology

A 34-year-old man with normal baseline cardiac and respiratory function starts on the ABVD (Adriamycin, bleomycin, vinblastine and dacarbazine) chemotherapy regimen for his stage IIB Hodgkin's lymphoma.

He tolerated the first three cycles of the chemotherapy well.

After completion of the fourth cycle he presents with exertional dyspnoea and a dry cough. He is afebrile, a chest x ray and ECG are normal.

Which of the following is the most likely diagnostic possibility?

- 1- Adriamycin related cardiomyopathy
- 2- Bleomycin related pulmonary fibrosis
- 3- Hyperemesis and reflex cough related to dacarbazine
- 4- Pneumocystis carinii pneumonia
- 5- Vinblastine related neurotoxicity

Answer & Comments

Answer: 2- Bleomycin related pulmonary fibrosis

Bleomycin related pulmonary fibrosis (option B) is a major toxicity of the widely used ABVD regimen for treatment of Hodgkin's disease.

Although Adriamycin can cause cardiotoxicity (option A) this is unusual at the doses used in this regimen and one would expect abnormalities on the ECG.

He is afebrile so Pneumocystis (option D) is less likely though needs to be considered in the differential.

There is no history of hyperemesis (option C) given and a vinblastine neuropathy (option E) is unlikely to present an acute shortness of breath.



[Q: 2772] OnExamination 2012 - Haematology

The risk of a viral infection transmitted via a transfusion is widely variable.

In the UK, the risk of transmission of hepatitis B would be best described as which of the following?

- 1- 0.05 per million donations
- 2- 0.2 per million donations
- 3- 1 per million donations
- 4- Slightly more than 2 per million donations
- 5- Slightly less than 0.01 per million donations

Answer & Comments

Answer: 4- Slightly more than 2 per million donations

The common viral infections considered in the infective risks of a blood transfusion are hepatitis B, hepatitis C and HIV.

The risks are variable depending on the source of donation and the type of testing employed but generally in the United Kingdom the risks for hepatitis B are in the order of 2.2/ million donations (hence option D) while those for HIV and hepatitis C are 0.2 and 0.05/ million donations (hence not options A, B, C and E).

A broad knowledge of the risks may be required while consenting a patient for blood transfusion.



[Q: 2773] OnExamination 2012 - Haematology

A patient on a medical ward received a transfusion 48 hours ago for symptomatic anaemia on background of chronic renal disease and obstructive airways disease. He gives a history of previous transfusions in the last year. The patient has now actually dropped his Hb by 2g/L compared to his pretransfusion level and reports a dark coloured urine. The LDH and bilirubin are elevated.

The is most likely to represent:

- 1- acute hepatitis as an infective complication
- 2- acute haemolytic transfusion reaction
- 3- delayed haemolytic transfusion reaction
- 4- non haemolytic febrile transfusion reaction
- 5- transfusion related graft versus host disease

Answer & Comments

Answer: 3- delayed haemolytic transfusion reaction

This case is an example of delayed haemolytic transfusion reaction which occurs 24 hrs after the transfusion (hence option c as explained further). This happens in a patient who has been previously immunized by transfusions or pregnancy. The antibodies are not detectable initially but becomes obvious as a secondary immune response to the antigen exposure during the transfusion occurs. A haemoglobin level, blood film, LDH, direct antiglobulin test, renal profile, serum bilirubin, haptoglobin and urinalysis for haemoglobinuria should be checked. The group and antibody screen should be repeated. A transfusion associated graft versus host disease and an acute hepatitis is unlikely given the time frame - both would be expected to occur in a week or

two (hence not options a or e). This is also not an acute hemolysis which would be expected to occur during the transfusion (hence not option b). Given the rise in Bilirubin and LDH this is a haemolytic reaction (hence not option d).



[Q: 2774] OnExamination 2012 - Haematology

Which of the following is the minimum dataset for identifying a patient and a sample for purpose of a blood transfusion request?

- 1- The full name and gender
- 2- The full name, gender, date of birth, address and patient identity number
- 3- The full name , gender and patient identity number
- 4- The full name, gender, address and patient identity number
- 5- The full name, gender, previous blood grouping details, address and patient identity number

Answer & Comments

Answer: 2- The full name, gender, date of birth, address and patient identity number

Given that maximum errors and near misses occur because of mislabelling or mistaken identity of the patient or the sample a minimum dataset is prescribed for transfusion requests.

This involves recording the full name, gender, date of birth, address (in some areas) and patient identity number (option B is correct).

Previous blood grouping details are not required and missing elements of this minimum dataset are not acceptable in the transfusion service (options A, C, D and E).



[Q: 2775] OnExamination 2012 - Haematology

You are taking ward referrals on behalf of the

renal team and are asked to see a 24-year-old woman who has been undergoing chemotherapy for acute myeloid leukaemia.

Unfortunately over the past 24 hours her condition has deteriorated and she is now oliguric; this is associated with a rise in her creatinine to 420 $\mu\text{mol/l}$ (79-118).

Which of the following treatments would have been most effective in preventing this episode?

- 1- Colchicine
- 2- IV normal saline
- 3- Naproxen
- 4- Prednisolone
- 5- Rasburicase

Answer & Comments

Answer: 5- Rasburicase

Tumour lysis syndrome is recognised after the onset of chemotherapy in patients with acute leukaemia.

Whilst ensuring adequate hydration and alkalinisation of urine is of value, rasburicase, (recombinant urate oxidase) is effective when used both pre and post the onset of chemotherapy in reducing urate accumulation.

The commonest reported side effect of rasburicase therapy is fever associated with administration and rasburicase overdose may lead to accumulation of hydrogen peroxide.

Other options for the management of tumour lysis syndrome include

Prophylactic allopurinol

Acetazolamide to drive urine alkalinisation.



[Q: 2776] OnExamination 2012 - Haematology

A 32-year-old woman presented to the Emergency department with right upper quadrant pain related to cholecystitis. The

pain settled with conservative management, but the surgeons noticed when they admitted her that she appears to have splenomegaly.

You examine her and confirm that she has an enlarged spleen. On further questioning she tells you that her father had his spleen removed.

Investigations show

Haemoglobin 10.9 g/dl

Spherocytes and reticulocytes seen on film (11.5-16.5)

Mean corpuscular volume 102 fl(80-96)

White cell count $7.9 \times 10^9/\text{L}$ (4-11)

Platelets $180 \times 10^9/\text{L}$ (150-400)

Serum Sodium 141 mmol/l (135-146)

Serum Potassium 4.4 mmol/l (3.5-5)

Creatinine 90 $\mu\text{mol/l}$ (79-118)

Which of the following is the most appropriate next investigation?

- 1- Autoimmune profile
- 2- Bone marrow biopsy
- 3- Coombs' test
- 4- Osmotic fragility test
- 5- Ultrasound scan abdomen

Answer & Comments

Answer: 4- Osmotic fragility test

This patient has a history which is strongly suggestive of hereditary spherocytosis, with increased haemolysis leading to increased risk of gallstones as seen here.

Spherocytosis occurs because of inherited defects in the membrane of red blood cells, leading to reduced cell deformability and this leads to the cells being removed by the spleen, which is the cause of progressive splenic enlargement.

Twenty to 30% of patients have mild disease, and, as in this case, can present later in life,

but 60-70% have more severe anaemia and splenic enlargement which leads to presentation in childhood.

Elective splenectomy is often required in severe cases, but patients with mild hereditary spherocytosis (HS) may require no intervention at all.



[Q: 2777] OnExamination 2012 - Haematology

A 54-year-old man comes to the endocrine clinic for review.

He has a history of type 2 diabetes which is currently managed with gliclazide 80 mg BD.

Most recently he has been diagnosed with abnormal liver function which the GP suspects is cirrhosis, although he claims he does not drink more than three to four glasses of wine per week.

He has split from his partner and admits to erectile dysfunction problems going back over the past three years.

On examination he looks tanned and has signs of chronic liver disease. There is sparse secondary sexual hair.

Investigations show

Haemoglobin 14.8 g/dl(13.5-18)

White cell count $6.0 \times 10^9/L$ (4-10)

Platelets $222 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (134-143)

Potassium 4.7 mmol/l (3.5-5)

Creatinine 130 $\mu\text{mol/l}$ (60-120)

ALT 230 u/l (5-40)

Glucose 10.5 mmol/l (<6.0)

Which of the following is the most appropriate single test with respect to revealing the underlying diagnosis?

- 1- Hepatitis serology
- 2- Serum ferritin
- 3- Serum iron

4- Serum testosterone

5- Transferrin saturation

Answer & Comments

Answer: 5- Transferrin saturation

The clinical presentation here is highly suspicious for genetic haemochromatosis. The best way to measure iron overload is via transferrin saturation which is calculated from the serum iron and the serum total iron binding capacity.

If the saturation is greater than 55% then genetic testing for the two commonest mutations, C282Y and H63D should be considered. Liver biopsy is indicated where there is evidence of liver damage, as indicated here by the raised alanine aminotransferase (ALT).

Treatment is with venesection, which is indicated until transferrin saturation falls to below 16%. Diabetes mellitus and hypogonadism may respond in some patients to venesection.



[Q: 2778] OnExamination 2012 - Haematology

A 23-year-old man with a teratoma of the testis attended for review following chemotherapy.

Which one of the following serum tumour markers is of most value in monitoring the clinical progression of his disease?

- 1- Alpha-fetoprotein
- 2- Carbohydrate antigen CA 15-3
- 3- Carbohydrate antigen CA 19-9
- 4- Carbohydrate antigen CA 125
- 5- Carcinoembryonic antigen

Answer & Comments

Answer: 1- Alpha-fetoprotein

Alpha-fetoprotein (AFP), beta-hCG and PLAP (placental like isoenzyme of alkaline phosphatase) are the major tumour markers in use for the monitoring of testicular teratoma.

CA 125, 15-3 and 19-9 are useful in bowel, pancreatic and ovarian tumours, and carcinoembryonic antigen (CEA) in large bowel tumours.



[Q: 2779] OnExamination 2012 - Haematology

A 17-year-old girl underwent emergency splenectomy after a domestic accident.

Which one of the following organisms is most likely to cause life-threatening infection in the future?

- 1- Actinomyces
- 2- Haemophilus influenzae
- 3- Pseudomonas aeruginosa
- 4- Staphylococcus aureus infection
- 5- Streptococcus pneumoniae

Answer & Comments

Answer: 5- Streptococcus pneumoniae

Following splenectomy a person is at risk of Streptococcus pneumoniae, Haemophilus influenzae, Neisseria meningitidis, Escherichia coli and Pseudomonas aeruginosa.

By far the most common is Streptococcus pneumoniae, which can cause life-threatening infection.



[Q: 2780] OnExamination 2012 - Haematology

You are asked to provide advice on a 35-year-old woman who is admitted under the maxillo-facial surgeons for extraction of wisdom teeth.

The only concern was that she had developed prolonged bleeding following a tooth

extraction 10 years previously and had required suturing. Besides this, she gave no other history of bleeding.

What is the most likely diagnosis?

- 1- Factor V Leiden
- 2- Factor IX deficiency
- 3- Factor XII deficiency
- 4- Primary antiphospholipid syndrome
- 5- von Willebrand's disease

Answer & Comments

Answer: 5- von Willebrand's disease

Not that much is given away by this history, just the issue of a prolonged bleed after prior dental extraction.

The most likely diagnosis when considering this patient is von Willebrand's disease which is an autosomal dominant condition and is one of the commonest bleeding disorders. Most cases are mild, with bleeding after only mild injury, particularly mucosal membrane injuries.

The condition is due to a reduction or structural abnormality of von Willebrand's factor, which has the dual role of promoting normal platelet function and stabilising coagulation factor VIII.

Von Willebrand's disease can give normal results on screening tests, and diagnosis may require specialist investigation.

Most patients with mild disease respond to desmopressin (DDAVP), but clotting factor concentrates are needed for a minority.



[Q: 2781] OnExamination 2012 - Haematology

Which of the following haematological disorders is inherited as an autosomal recessive condition?

- 1- Antithrombin III deficiency

- 2- Protein C deficiency
- 3- Glucose-6-phosphate dehydrogenase deficiency
- 4- Pyruvate kinase deficiency
- 5- Acute intermittent porphyria

Answer & Comments

Answer: 4- Pyruvate kinase deficiency

A. Anti-thrombin 3 (AT3) is a plasma inhibitor protein that blocks the enzymatic activity of some serine proteases coagulation factors. The activity of this inhibitor is increased by heparin.

AT3 is synthesised by the liver, is not vitamin K dependent, and can be consumed during disseminated intravascular coagulation (DIC). Normal newborns have a reduced activity. Congenital AT3 deficiency is an autosomal dominant. Treatment of thrombotic events in these patients may be difficult.

B. Protein C is an inhibitor that, once activated, inhibits clot formation and enhances fibrinolysis. It is liver synthesised and vitamin K dependent. Protein C is converted to an active enzyme by a thrombin-thrombomodulin complex on the endothelial cell surface.

Activated protein C inhibits a plasminogen activator inhibitor, which results in enhanced fibrinolysis, and, with protein S as a co-factor, inhibits the clotting of the activated factors 5 and 8 by limited proteolysis. Activated protein C thus controls the conversion of factor 10 to 10a and prothrombin to thrombin.

Congenital deficiency is an autosomal dominant trait. Acquired deficiency may occur in association with infection.

C. Glucose-6-phosphate dehydrogenase deficiency is the most important disease of the pentose phosphate pathway, and is responsible for two clinical syndromes:

An episodic haemolytic anaemia induced by infections or certain drugs

A spontaneous chronic non-spherocytic haemolytic anaemia.

The deficiency is X linked, and heterozygous females are resistant to falciparum infections. There are a large number of abnormal alleles causing disease of vastly different severity.

D. Pyruvate kinase deficiency is a rare congenital haemolytic anaemia inherited as an autosomal recessive. Generation of adenosine triphosphate (ATP) within the red cell is impaired, resulting in an abnormally high concentration of 2,3,DPG in the red cell, which inhibits the enzymes of the pentose phosphate pathway.

Clinical manifestations vary from severe neonatal haemolysis, to a mild, well compensated haemolysis first noted in adulthood.

E. Acute intermittent porphyria is an autosomal dominant disorder resulting from partial porphobilinogen deaminase deficiency in the cytosol of all tissues including erythrocytes. Clinical expression of the disease is linked to environmental or acquired factors such as

Nutritional status

Drugs

Steroids

Chemicals.

The major abnormality is of the peripheral, autonomic or central nervous system (CNS).

Major symptoms are abdominal pain, nausea, vomiting, constipation or diarrhoea. In severe cases the urine develops a port wine colour due to the high content of porphobilin, an auto-oxidation product of PBG.

Hypertension and neuropathy are common, with muscle weakness, cranial nerve abnormality and seizures.



[Q: 2782] OnExamination 2012 -
Haematology

A 42-year-old man presents with increasing abdominal pain and a feeling of fullness and nausea when he eats. He has also felt constitutionally unwell over the past few weeks and months with some night sweats and gradual weight loss.

On examination his BMI is 21, his BP is 126/82 mmHg, pulse 80 and regular, his temperature is 37.4°C. He has an abdominal fullness with some evidence of ascites.

Investigations show

Haemoglobin 10.9 g/dl(13.5-17.7)

White cell count $8.9 \times 10^9/L$ (4-11)

Platelets $188 \times 10^9/L$ (150-400)

ESR 67 mm/hr(<10)

Serum Sodium 137 mmol/l (135-146)

Serum Potassium 4.9 mmol/l (3.5-5)

Creatinine 115 $\mu\text{mol/l}$ (79-118)

Alanine aminotransferase 85 U/l (5-40)

Colonoscopy Caecal mass, suggestive of Burkitt's lymphoma

Which translocation is likely to be found in the Burkitt's cells?

1- 2:5

2- 8:14

3- 8:21

4- 9:21

5- 14:11

Answer & Comments

Answer: 2- 8:14

Burkitt's lymphoma is associated with a t(8;14)(q24;q32) translocation, which is observed in approximately 80% of patients with the disease. What this does is to juxtapose c-Myc, which is a transcription factor responsible for initiating the cell cycle,

with the locus for the immunoglobulin heavy chain.

Burkitt's lymphoma, particularly sporadic lymphoma, may be seen in adults and commonly involves the abdominal organs, usually the caecum as seen here, or the distal ileum.

Localised Burkitt's is associated with around a 90% survival rate, although the prognosis is less good in adults.



[Q: 2783] OnExamination 2012 -
Haematology

Which one of the following is true of IgE?

1- Crosses the normal placenta

2- Is increased acutely in an asthmatic attack

3- Is increased in the serum of atopic individuals

4- Is involved in type 2 hypersensitivity

5- Is present in plasma in the same concentration as IgG

Answer & Comments

Answer: 3- Is increased in the serum of atopic individuals

IgG is the predominant form of immunoglobulin in plasma at a concentration around 10,000 times that of IgE.

IgG crosses the placenta to confer immunity to the fetus but IgE does not.

IgE is involved in arming mast cells and basophils. IgE causes mast cells to release vasoactive amines, such as histamine, producing an inflammatory response which can result in a type I hypersensitivity reaction.

IgE is responsible for allergen-mediated diseases such as anaphylaxis, asthma and atopy.

Total serum IgE is frequently increased in those with atopy but serum IgE does not rise acutely during an asthmatic attack.



[Q: 2784] OnExamination 2012 - Haematology

Which of the following malignancies is associated with HTLV-1 infection?

- 1- Adult T cell leukaemia
- 2- Burkitt's lymphoma
- 3- Chronic lymphocytic leukaemia
- 4- Pancreatic cancer
- 5- Transitional cell carcinoma

Answer & Comments

Answer: 1- Adult T cell leukaemia

Between 1:10 and 1:20 are believed to develop malignancy associated with human T lymphotropic virus 1 (HTLV-1); adult T cell leukaemia/lymphoma.



[Q: 2785] OnExamination 2012 - Haematology

A 29-year-old man is starting a chemotherapy regime that includes cisplatin.

Which of the following is the mechanism of action of cisplatin?

- 1- Causes crosslinking in DNA
- 2- Degrades preformed DNA
- 3- Inhibits purine synthesis
- 4- Reduces the formation of microtubules
- 5- Stabilises DNA-topoisomerase II complex

Answer & Comments

Answer: 1- Causes crosslinking in DNA

"Cisplatin acts by crosslinking DNA in several different ways, making it impossible for rapidly dividing cells to duplicate their DNA for mitosis." Wikipedia: cisplatin



[Q: 2786] OnExamination 2012 - Haematology

A 20-year-old man presented to hospital two days after returning from visiting his family in Bangladesh.

Within a day of his return to the United Kingdom he suddenly developed profuse watery diarrhoea. He says there had been an outbreak of diarrhoea in his family's village in the week before his return.

Stool culture revealed a growth of *Vibrio cholerae*.

Which one of the following blood types is associated with the greatest susceptibility to severe cholera?

- 1- Blood Group A
- 2- Blood Group AB
- 3- Blood Group B
- 4- Blood Group O
- 5- Rhesus -ve

Answer & Comments

Answer: 4- Blood Group O

"Individuals with blood group O are more susceptible than other individuals to severe cholera, although the mechanism underlying this association is unknown." Infect Immun. 2005 Nov; 73(11): 7422-7.



[Q: 2787] OnExamination 2012 - Haematology

A 52-year-old woman presents with tiredness and weight gain. She is confirmed to have autoimmune thyroiditis.

Which of the following tumours is she at increased risk of developing?

- 1- Anaplastic carcinoma of the thyroid
- 2- Follicular carcinoma of the thyroid
- 3- Medullary carcinoma of the thyroid
- 4- Papillary carcinoma of the thyroid

5- Thyroid lymphoma

Answer & Comments

Answer: 5- Thyroid lymphoma

There is a small but recognised risk of developing thyroid lymphoma associated with autoimmune thyroiditis (also known as Hashimoto's disease or lymphocytic thyroiditis).

The risk is small and would certainly not be screened for, nor should it in patients with autoimmune thyroid disease.



[Q: 2788] OnExamination 2012 - Haematology

A 70-year-old male is diagnosed with multiple myeloma and is treated with melphalan and prednisolone.

Which of the following when added to this chemotherapeutic regime would be expected to improve survival?

- 1- Cyclosporin
- 2- Interferon alpha
- 3- Methotrexate
- 4- Simvastatin
- 5- Thalidomide

Answer & Comments

Answer: 5- Thalidomide

Significant improvements in survival may be expected through the addition of thalidomide to standard chemotherapeutic regimes.

Studies suggest a significant improvement at both two years and five years with thalidomide.

NEJM 2006; 367:825-31.

Lancet 2006 354:1021-1-30



[Q: 2789] OnExamination 2012 - Haematology

A 55-year-old asymptomatic woman with mild splenomegaly was found to have a platelet count of $650 \times 10^9/L$ ($150-400 \times 10^9$) on blood investigation. White blood cells and haemoglobin are within the normal range.

What is the next step in management?

- 1- Anagrelide
- 2- Hydroxycarbamide
- 3- Low dose aspirin
- 4- Observation
- 5- Plateletpheresis

Answer & Comments

Answer: 4- Observation

In essential thrombocythosis low risk patients have a risk of thrombosis similar to that of the age and sex-matched population and a very low risk of life-threatening bleeding, supporting close observation as the most sensible approach.

Hydroxycarbamide is an adequate choice for patients 60 years of age or older who are otherwise in good health.

For elderly patients with limited projected survival (less than 10 years) and who have problems with other drug compliance, 32P administration might be appropriate.

Anagrelide should be offered to younger patients (less than 60) who are at high risk by virtue of a prior history of thrombosis.

In patients who suffer from thrombotic episodes, especially episodes involving the microcirculation or large vessels, low-dose aspirin (100 mg/day) is usually administered.

In severe life-threatening episodes rapid cyto-reduction may be achieved by plateletpheresis or by the administration of a single dose of 0.4 mg/kg of nitrogen mustard.



[Q: 2790] OnExamination 2012 -
Haematology

A 59-year-old male is referred with an abnormal full blood count (FBC).

He had presented to his general practitioner with a flu-like illness which has since subsided but a FBC revealed a platelet count of $800 \times 10^9/L$ ($150-400 \times 10^9$) which has remained persistently elevated but with no other abnormality on the FBC.

He is otherwise entirely asymptomatic and no abnormalities are noted on examination.

Which of the following is the most appropriate treatment for this patient?

- 1- Anagrelide
- 2- Aspirin
- 3- Hydroxycarbamide
- 4- Observation
- 5- Plateletpheresis

Answer & Comments

Answer: 4- Observation

There are a number of adverse prognostic markers for essential thrombocythaemia (ET):

Age above 60

Symptomatology - particularly thrombosis and

Platelet count above 1500.

Generally the prognosis is extremely good in ET with survival of over two decades expected.

This patient would be regarded as low risk and hence observation only employed.

The risk of bleeding can also be a problem and although you may think that aspirin would be appropriate the evidence is conflicting.



[Q: 2791] OnExamination 2012 -
Haematology

A 62-year-old female with colonic carcinoma is

treated with chemotherapy and is receiving ondansetron for intractable nausea and vomiting.

Which of the following best describes the pharmacological actions of ondansetron?

- 1- Anticholinergic
- 2- Cannabinoid
- 3- Dopaminergic antagonists
- 4- H1 antihistamine
- 5- 5-HT3 antagonist

Answer & Comments

Answer: 5- 5-HT3 antagonist

Ondansetron is a selective 5-HT3 antagonist both centrally and peripherally and as such is a potent antiemetic.



[Q: 2792] OnExamination 2012 -
Haematology

A man presents with generalised fatigue and weakness. A diagnosis of Eaton-Lambert syndrome is made.

An antibody to what cellular component is found in this condition?

- 1- Anticholinesterase
- 2- Mitochondria
- 3- Potassium channels
- 4- Sodium channels
- 5- Voltage gated calcium channels

Answer & Comments

Answer: 5- Voltage gated calcium channels

The EL syndrome is rare and unlike myasthenia gravis which affects mostly women primarily affects men over the age of 40 and is usually associated with an underlying bronchial neoplasm.

Strength usually is reduced in proximal muscles of the legs and arms producing a waddling gait and difficulty elevating the arms.

The disorder is associated with the presence of antibodies against the voltage dependent calcium channels.



[Q: 2793] OnExamination 2012 - Haematology

A 24-year-old female student presented with fever and rigors for two days, fatigue, headache especially retro-orbital and diarrhoea. In particular she complained of a weakness of the left side of her face and drooping of the lip.

She had recently returned from a sabbatical in Uganda four weeks previously.

She was febrile (39.9°C), had a mild left facial nerve palsy, lymphadenopathy in her axillae and groin and she had an erythematous, maculopapular rash.

Laboratory investigations showed:

Haemoglobin 12.0 g/dl (11.5-16.5)

WBC $3.0 \times 10^9/L$ (4-11 $\times 10^9$)

Platelets $150 \times 10^9/L$ (150-400 $\times 10^9$)

Blood film Lymphopenia, some atypical lymphocytes seen

Which of the following is the most likely diagnosis?

- 1- Acute HIV infection (seroconversion illness)
- 2- Dengue fever
- 3- Infectious mononucleosis
- 4- Typhoid fever
- 5- Viral hepatitis

Answer & Comments

Answer: 1- Acute HIV infection (seroconversion illness)

Acute human immunodeficiency virus (HIV) seroconversion illness should be suspected where there has been a risk of exposure.

The symptoms and signs are often vague but the clinical presentation here is consistent. The median time from exposure to presentation is 25 days.

More than three quarters of patients who become infected with HIV develop symptoms consistent with primary HIV infection.

Symptoms typically appear a few days to a few weeks after exposure to HIV, and generally include several of the following:

Fever

Rash, often erythematous maculopapular

Fatigue

Pharyngitis

Generalised lymphadenopathy

Urticaria

Myalgia/arthritis

Anorexia

Mucocutaneous ulceration

Headache, retro-orbital pain

Neurologic symptoms, e.g.

aseptic meningitis

radiculitis

myelitis.

Source: AETC National Resource Center



[Q: 2794] OnExamination 2012 -
Clinical pharmacology

Which of the following is correct regarding lead poisoning?

- 1- Can only result from lead ingestion
- 2- Causes a peripheral neuropathy due to demyelination
- 3- Causes adrenal suppression
- 4- Commonly presents with diarrhoea
- 5- Is associated with a macrocytic anaemia

Answer & Comments

Answer: 2- Causes a peripheral neuropathy due to demyelination

Lead can also be absorbed through the skin and by inhalation.

It is associated with iron deficiency and a microcytic anaemia.

The most common gastrointestinal symptoms are abdominal colic and constipation.



[Q: 2795] OnExamination 2012 -
Clinical pharmacology

You are asked to review a 71-year-old woman who comes to the clinic complaining that her hearing is not as good as it was after a prolonged period of treatment in hospital for infective endocarditis.

On examination you find that she has significant sensorineural hearing impairment and you suspect this may be gentamicin related.

What is the mechanism of ototoxicity associated with gentamicin?

- 1- Cell wall integrity disruption
- 2- DNA toxicity
- 3- Interruption of cell division
- 4- Nitric oxide reduction
- 5- Oxygen free radical generation

Answer & Comments

Answer: 5- Oxygen free radical generation

Gentamicin is toxic to cochlear hair cells, and it is known to disrupt mitochondrial protein synthesis, which leads to increased oxygen free radical generation via inducible nitric oxide synthase activity.

Peroxynitrite radicals are formed, which then leads to apoptosis.

It is thought that aminoglycosides take longer to clear from inner ear fluids, which may account for the site specific toxicity seen with this class of antibiotics.

A switch from BD dosing to OD dosing has reduced the susceptibility of patients to toxicity, and once daily regimes are now the preferred method of gentamicin administration.

Peak (one hour post dose), and trough, (pre-dose levels) are assayed to determine dose adjustments. A dose of 3 mg/kg/day is the usual starting level in adults with normal renal function.

Gentamicin may be used in patients with impaired renal function, but dose level and interval between doses needs to be adjusted to avoid toxicity.



[Q: 2796] OnExamination 2012 -
Clinical pharmacology

A 21-year-old nurse comes to the clinic requesting contraception. She works shifts including nights, and so often wakes up at odd times of the day. She has recently married and may want to start a family during the next two years.

Her mother suffered a DVT three years ago.

On further questioning she has some problems with libido and has heard that progesterone only based preparations may impact on this. On examination she looks well, her BMI is 21, and her BP is 100/70 mmHg.

Which of the following is likely to be the most appropriate medication for her?

- 1- Combined oral contraceptive pill
- 2- Diaphragm
- 3- Mirena coil
- 4- Progesterone implant
- 5- Progesterone only pill

Answer & Comments

Answer: 1- Combined oral contraceptive pill

The fact that her mother suffered a deep vein thrombosis (DVT) is largely irrelevant with respect to assessing her DVT risk.

For the progesterone only pill, it must be taken within three hours of the time the pill was taken on the previous day; given she works shifts this is likely to have a significant impact and increase the chances of a missed pill.

The time window for a missed pill with respect to the combined pill is 12 hours.

Given that she may decide to start a family at any time, the progesterone implant or Mirena coil do not seem to be ideal options, and progesterone only preparations may be associated with a reduced libido.

The diaphragm has a higher failure rate and should definitely not be the first choice in this patient.

The primary action of the combined oral contraceptive pill is inhibition of ovulation, although there are also alterations to the cervical mucus and endometrium which may contribute to effectiveness.

In contrast the progesterone only pill does not necessarily affect ovulation and its primary mode of action is on cervical mucus and implantation.

Long acting progesterone preparations prevent proliferation of the endometrium,

thicken cervical mucus and suppress ovulation in some women.

The major risk of the combined oral contraceptive pill is thromboembolic disease; with respect to long acting progesterone, the major concerns are around irregular menstrual bleeding and changes in libido.



[Q: 2797] OnExamination 2012 -
Clinical pharmacology

A 23-year-old woman presents to the Emergency department with low grade fever and dysuria. Her only medication is the oral contraceptive pill.

On examination her temperature is 37.8°C, and she has suprapubic and left loin tenderness consistent with a urine infection and possible pyelonephritis.

Investigations show:

Haemoglobin 12.5 g/dl 11.5-16.5

White cell count $12.8 \times 10^9/L$ 4-11

Platelets $209 \times 10^9/L$ 150-400

Serum Sodium 139 mmol/l 135-146

Serum Potassium 3.9 mmol/l 3.5-5

Creatinine 82 $\mu\text{mol/l}$ 79-118

Which of the following antibiotics do SIGN guidelines recommend for this patient?

- 1- Amoxicillin
- 2- Ciprofloxacin
- 3- Co-trimoxazole
- 4- Nitrofurantoin
- 5- Trimethoprim

Answer & Comments

Answer: 2- Ciprofloxacin

Upper urinary tract infection is one area where resistance to antimicrobials is increasing.

For this reason trimethoprim and amoxicillin are not recommended for treatment of upper urinary tract infections, and even resistance to quinolones such as ciprofloxacin is now beginning to prove problematic.

Nitrofurantoin is not used for the treatment of upper urinary tract infections because of difficulty in achieving sufficient plasma concentration, and co-trimoxazole is a second line choice due to problems with blood dyscrasias.

HPA suggests patients started on ciprofloxacin should have urine sent for culture and patients admitted to hospital if there is no response to treatment in 24 hours.

Reference:

<http://www.sign.ac.uk/pdf/sign88.pdf>



[Q: 2798] OnExamination 2012 - Clinical pharmacology

A 61-year-old man presents to the emergency department complaining of lethargy and muscle weakness. He has begun therapy for hypertension with bendroflumethiazide a few weeks earlier. Blood testing reveals a potassium of 2.5 mmol/l.

Which of the following is the most likely cause of his hypokalaemia?

- 1- Increased sodium within the ascending loop of Henle
- 2- Increased sodium within the descending loop of Henle
- 3- Increased sodium within the distal collecting duct
- 4- Increased sodium within the distal convoluted tubule
- 5- Increased sodium within the proximal convoluted tubule

Answer & Comments

Answer: 4- Increased sodium within the distal convoluted tubule

Thiazides block sodium reabsorption in the proximal segment of the distal convoluted tubule. This promotes increased delivery of sodium to the distal segment of the distal convoluted tubule. There the aldosterone sensitive sodium potassium exchange pump is presented with increased luminal sodium, which leads to increased excretion of potassium and hydrogen ions.

Often thiazide diuretics are combined in the treatment of hypertension with an ACE inhibitor or angiotensin receptor blocker (ARB), in which case hypokalaemia does not normally present itself as a problem.



[Q: 2799] OnExamination 2012 - Clinical pharmacology

A 60-year-old lady presented with heartburn. She is known to have osteoporosis and has been taking alendronate for a number of years.

Which of the following is the most likely cause of her symptoms?

- 1- Achalasia
- 2- Calcification of lower oesophageal sphincter
- 3- Crush fracture
- 4- Ischaemic heart disease
- 5- Oesophagitis

Answer & Comments

Answer: 5- Oesophagitis

"Oral bisphosphonates seem to induce serious esophagitis in some patients, may result in gastritis and cause diarrhoea. When used as recommended, serious esophageal complications are few. Patients with known esophageal disease (e.g. achalasia, stricture, Barrett's esophagus, severe reflux and scleroderma) should avoid taking oral bisphosphonates." American Family Physician 2000;61:2731-6



[Q: 2800] OnExamination 2012 -
Clinical pharmacology

A 59-year-old male with type 2 diabetes is attending the foot clinic regularly.

He has a neuropathic ulcer complicated by osteomyelitis. A deep wound swab has grown *Staphylococcus aureus* and *Escherichia coli*.

He also takes warfarin for atrial fibrillation.

Which of the following antibiotics will reduce the anticoagulant effect of warfarin?

- 1- Ciprofloxacin
- 2- Co-trimoxazole
- 3- Erythromycin
- 4- Metronidazole
- 5- Rifampicin

Answer & Comments

Answer: 5- Rifampicin

The anticoagulant effect of warfarin can be affected by drugs, which induce or inhibit the action of enzymes involved in the metabolism of warfarin.

Rifampicin is known to induce the action of such enzymes, therefore increasing the metabolism of warfarin and so reducing its anticoagulant effect.

Erythromycin and ciprofloxacin inhibit the effect of these enzymes, therefore enhancing the anticoagulant effect of warfarin.

Metronidazole and co-trimoxazole inhibit the clearance of the active S isomer of warfarin, therefore enhancing its anticoagulant effect.



[Q: 2801] OnExamination 2012 -
Clinical pharmacology

A 56-year-old female who is taking warfarin for atrial fibrillation and has had a stable INR of between 2-2.5 over the last one year is noted to have an INR on the last visit of 7.8 (>1.4).

Consumption of which of the following may be responsible for this?

- 1- Carrot juice
- 2- Cranberry juice
- 3- Oil of evening primrose
- 4- Orange juice
- 5- St John's wort

Answer & Comments

Answer: 2- Cranberry juice

Cranberry juice has been recognised to be responsible for a deranged INR, it being postulated that it inhibits cytochrome p450.

St John's wort induces cytoP450 and therefore reduces INR.



[Q: 2802] OnExamination 2012 -
Clinical pharmacology

A 45-year-old male takes lithium for a bipolar affective disorder.

Which of the following drugs would be contraindicated in conjunction with lithium?

- 1- Atenolol
- 2- Bendroflumethiazide
- 3- Codeine phosphate
- 4- Flucloxacillin
- 5- Thyroxine

Answer & Comments

Answer: 2- Bendroflumethiazide

Caution should be exercised when taking lithium and diuretics as the latter may reduce renal clearance of lithium and increase serum lithium concentrations.

Non-steroidal anti-inflammatory drugs (NSAIDs) also increase lithium concentrations.

Metronidazole, angiotensin-converting enzyme inhibitors (ACEis) and calcium channel

blockers also increase serum lithium concentrations.



[Q: 2803] OnExamination 2012 -
Clinical pharmacology

Which of the following statements regarding Antabuse (disulfiram) is/are correct?

- 1- Antabuse acts by promoting the metabolism of acetaldehyde
- 2- Can be used in patients with a history of psychosis in order to limit alcohol excess
- 3- Can be used to assist abstinence from alcohol in patients with heart disease
- 4- Patients using alcohol based perfumes may develop serious reactions
- 5- Requires regular dose titration once initiated

Answer & Comments

Answer: 4- Patients using alcohol based perfumes may develop serious reactions

Antabuse inhibits the breakdown of acetaldehyde, which is a major metabolite of alcohol.

It is the accumulation of acetaldehyde which causes the flushing, sweating, palpitations, nausea, and vomiting seen in patients taking Antabuse who imbibe alcohol.

These reactions may also occur with alcohol based products, for example, perfume.

Antabuse is contraindicated in cirrhosis and heart disease, and psychosis is a relative contraindication for its use.



[Q: 2804] OnExamination 2012 -
Clinical pharmacology

A 57-year-old man with a history of stable coronary artery disease comes to the clinic for review.

He suffered an inferior myocardial infarction some seven years earlier, but has been

troubled with only relatively minor chest pain since this time.

He takes a number of medications for control of blood pressure, cholesterol and his angina. On examination his BP is 145/72 mmHg, pulse is 70 and regular. His chest is clear and there is no ankle swelling.

He tells you that he has been buying sildenafil over the internet for erectile dysfunction.

Which of the following medications would concern you most with respect to possible drug interaction?

- 1- Atorvastatin
- 2- Bisoprolol
- 3- Indapamide
- 4- Nicorandil
- 5- Ramipril

Answer & Comments

Answer: 4- Nicorandil

Sildenafil leads to significant hypotension with nitrates and drugs such as nicorandil which act as nitrate donors. As such it is contraindicated for use with these agents.

Atorvastatin, bisoprolol, indapamide and ramipril are all commonly prescribed in patients with erectile dysfunction and no significant interaction with PDE-5 inhibitors is recognised.

Alpha blockers may lead to hypotension in patients prescribed sildenafil and caution is therefore advised where co-prescription is considered.

Sildenafil is metabolised via the CYP3A4 pathway, as such caution is also advised when co-prescribing agents such as erythromycin and increased consumption of grapefruit juice.



[Q: 2805] OnExamination 2012 -
Clinical pharmacology

In which of the following would the first drug

be associated with increased pharmacological action of the second drug?

- 1- Erythromycin : theophylline
- 2- Phenytoin : ethinyloestradiol
- 3- Ranitidine : corticosteroid
- 4- Rifampicin : warfarin
- 5- Valproate : phenobarbitone

Answer & Comments

Answer: 1- Erythromycin : theophylline

Erythromycin would inhibit the metabolism of theophylline.

Ranitidine unlike cimetidine is not an enzyme inhibitor.

Phenytoin would speed up metabolism of ethinyloestradiol making the pill less effective.

Rifampicin is a well recognised enzyme inducer.



[Q: 2806] OnExamination 2012 - Clinical pharmacology

A 71-year-old man is treated for paroxysmal atrial fibrillation with 200 mg of amiodarone per day.

He is finding extreme problems with photosensitivity and wants to discontinue the medication.

Which of the following is true of amiodarone therapy?

- 1- It has a half life of 36 hours so stopping the medication will be associated with an immediate improvement
- 2- Photosensitivity is a rare occurrence
- 3- Purple skin discoloration is seen independent of photosensitivity
- 4- Skin sensitivity can be prevented by using a sun block

- 5- Thyroid dysfunction is seen more commonly in patients who experience photosensitivity

Answer & Comments

Answer: 4- Skin sensitivity can be prevented by using a sun block

Photosensitivity is seen very commonly in those patients who are prescribed amiodarone therapy. It is distinct from the slate grey skin discolouration which can occur with prolonged amiodarone use and can be prevented by using a total sun block preparation.

The half life of amiodarone has a mean of around 50 days, and may be as short as 20 days in some individuals and as long as 100 days in others. Slate grey or blue skin appearance is the commonest pigmentation change seen in association with treatment.

The incidence of amiodarone induced thyroid dysfunction has no relationship at all to photosensitivity.



[Q: 2807] OnExamination 2012 - Clinical pharmacology

A 49-year-old woman presents to the Emergency department with right sided pleuritic chest pain. She has had two previous pulmonary emboli (PE) and is on lifelong warfarin therapy.

On examination she is short of breath and in pain. Her BP is 105/70 mmHg and her pulse is 92. Auscultation of the chest is normal. She has a swollen left leg, but she tells you this is chronic since an extensive DVT a few years earlier.

Investigations reveal:

Haemoglobin 12.5 g/dl (11.5-16.5)

White cell count $7.2 \times 10^9/L$ (4-11)

Platelets $203 \times 10^9/L$ (150-400)

Serum Sodium 137 mmol/l (135-146)

Serum Potassium 4.2 mmol/l (3.5-5)

Creatinine 82 µmol/l (79-118)

INR 2.22-3

CXR No focal changes

paO₂ 8.2 kPa10-13.3

paCO₂ 4.2 kPa4.8-6.1

Which of the following is the most appropriate next step?

- 1- Add aspirin to her therapy
- 2- Add clopidogrel to her therapy
- 3- Increase the INR target to 3-4
- 4- Increase the INR target to 4-5
- 5- Refer for an IVC filter

Answer & Comments

Answer: 5- Refer for an IVC filter

In this situation, where she is anticoagulated yet has sustained a further PE, there are two potential choices, either to consider increasing her INR target to 3-4, or considering an IVC filter.

Contraindications to anticoagulation where an IVC filter may be considered include

Haemorrhagic stroke

Recent neurosurgery or other major surgery

Major trauma and

Evidence of active internal bleeding.

Other contraindications include

Pregnancy

Frequent falls and

Poor potential compliance with warfarin.

In these situations an IVC filter may be the most appropriate option. Given her young age and the potential for further PEs, a filter may be considered ahead of increased warfarin dose.

IVC filters may also be considered for prophylaxis in patients who have a diagnosis of cancer or who have a DVT and are about to undergo surgery. In this case, anticoagulation may result in more problems than filter placement.

A previous relative contraindication to filter placement was the need to undergo MRI, but now, MRI proof filters are available and this is no longer a problem.

www.bcsghguidelines.com/documents/vena_cava_filters_bjh_2006.pdf



[Q: 2808] OnExamination 2012 - Clinical pharmacology

You are investigating a new anti-platelet agent which may have additional effects on top of clopidogrel. To investigate the effects of the new therapy you need to be aware of the mode of action of clopidogrel.

Which of the following best describes the action of clopidogrel?

- 1- 5HT-2 receptor inhibition
- 2- Cox-1 inhibition
- 3- Cox-2 inhibition
- 4- IIb IIIa inhibition
- 5- Inhibition of the platelet ADP receptor

Answer & Comments

Answer: 5- Inhibition of the platelet ADP receptor

The answer is inhibition of the platelet ADP receptor, which leads to decreased propensity to platelet aggregation and is complementary to cyclo-oxygenase inhibition, which of course is the action of aspirin.

5HT-2 receptor inhibition also reduces platelet aggregation; one example is sarpogrelate developed in North East Asia primarily as an alternative to aspirin because of its association with a lower risk of haemorrhage.

IIb IIIa inhibitors are used in patients with unstable angina/NSTEMI, an example being abciximab.



[Q: 2809] OnExamination 2012 -
Clinical pharmacology

A 55-year-old woman, who has a history of atrial fibrillation and is receiving warfarin and digoxin, informs you that she has been feeling down of late and has been self medicating with St John's wort which she obtained from a health shop.

Which of the following interactions may be expected between St John's Wort and her current medication?

- 1- Digoxin concentrations are unlikely to be affected
- 2- INR is likely to be increased
- 3- INR is likely to be reduced
- 4- INR is likely to be unaffected
- 5- There is an increased risk of digoxin toxicity

Answer & Comments

Answer: 3- INR is likely to be reduced

St John's wort is now commonly taken for depressive symptoms, yet it is a liver enzyme inducer and therefore has interactions with medications typically reducing the efficacy.

In this regard, St John's wort may reduce the efficacy of warfarin, requiring increased dose to maintain the INR and it may also reduce the efficacy of digoxin.



[Q: 2810] OnExamination 2012 -
Clinical pharmacology

The nurse bleeped you because an obese patient is feeling nauseous and is vomiting. He is also complaining of seeing green and yellow halos.

He has recently been treated with a standard intravenous bolus of digoxin for fast atrial

fibrillation. His creatinine clearance is normal. Digoxin toxicity is suspected.

What do you think is the cause of his symptoms?

- 1- Decreased hepatic excretion
- 2- Decreased protein binding
- 3- Decreased renal clearance
- 4- Decreased volume of distribution
- 5- Increased half life

Answer & Comments

Answer: 4- Decreased volume of distribution

Digoxin is concentrated in tissues and therefore has a large apparent volume of distribution. Serum digoxin concentrations are not significantly altered by large changes in fat tissue weight so that its distribution space correlates best with lean (that is, ideal) body weight, not total body weight.

In this case a higher dose than necessary was given due to calculation on the patient total body weight, resulting in digoxin toxicity. In other words his distribution space had been overestimated. Ideal body weight should be used, rather than total body weight, when calculating doses.

Approximately 25% of digoxin in the plasma is bound to protein.



[Q: 2811] OnExamination 2012 -
Clinical pharmacology

A 90-year-old man with chronic leukaemia presents with gout which his general practitioner treats with allopurinol.

How does allopurinol prevent the accumulation of uric acid?

- 1- By competing for its transporter to the kidney
- 2- By enhancing its solubility
- 3- By inhibiting purine synthesis

- 4- By inhibiting pyrimidine synthesis
- 5- By inhibiting the inflammatory response it causes

Answer & Comments

Answer: 3- By inhibiting purine synthesis

Allopurinol is a xanthine oxidase inhibitor and is converted by this enzyme to alloxanthine.

In this form it inhibits the conversion of hypoxanthine to xanthine and the conversion of xanthine to uric acid, therefore inhibiting the formation of uric acid.



[Q: 2812] OnExamination 2012 - Clinical pharmacology

A 50-year-old male has a blood pressure of 160/90 mmHg on two consecutive days.

You decide that you are going to initiate drug therapy.

Which of the following statements regarding your decision is correct?

- 1- ACE inhibitors should not be used as first line treatment in Afro-Caribbean patients
- 2- An alpha-blocker would be a first line agent in this patient
- 3- If the patient is non-caucasian a beta-blocker would be an appropriate first line treatment
- 4- Potassium monitoring is not required if an ACE inhibitor is prescribed without the addition of spironalactone
- 5- Spironalactone would be an appropriate second line agent in this patient

Answer & Comments

Answer: 1- ACE inhibitors should not be used as first line treatment in Afro-Caribbean patients

ACE inhibitors have low efficacy in black patients in the clinical trials of ACE inhibitors.

According to the British Hypertension Society guidelines (J Hum Hypertension 2003;17:81-86) first line treatment in black patients and patients older than 55 years of age should be with a diuretic or a calcium channel blocker.

An alpha blocker or spironalactone should only be used as an adjunct treatment in resistant hypertension.



[Q: 2813] OnExamination 2012 - Clinical pharmacology

A 52-year-old woman takes lithium carbonate for manic depression and also takes codeine and diclofenac prescribed by her GP for osteoarthritis.

Which one of the following statements is correct?

- 1- Codeine will reduce the bioavailability of lithium
- 2- The analgesic effect of codeine will be reduced by co-administration of diclofenac
- 3- The nephrotoxicity of diclofenac will be increased in this patient
- 4- Plasma lithium concentration will be increased by codeine
- 5- Plasma lithium concentrations will be raised by diclofenac

Answer & Comments

Answer: 5- Plasma lithium concentrations will be raised by diclofenac

Diclofenac decreases renal lithium clearance and increases lithium concentrations.

Codeine and diclofenac are frequently co-prescribed.



[Q: 2814] OnExamination 2012 - Clinical pharmacology

A 68-year-old lady with mitral valve disease and atrial fibrillation is taking warfarin. Lately her international normalised (INR) has fallen

and the dose of warfarin has had to be increased.

Which of the following new treatments may account for this change?

- 1- Allopurinol
- 2- Amiodarone
- 3- Clarithromycin
- 4- Sertraline
- 5- St John's wort

Answer & Comments

Answer: 5- St John's wort

The metabolism of warfarin has been increased since it is becoming less effective.

St John's wort is an enzyme inducer.

The other drugs are enzyme inhibitors.



[Q: 2815] OnExamination 2012 - Clinical pharmacology

A 52-year-old man has been started on regular diclofenac for back pain. He is concerned as over the past few days he has been suffering from deteriorating vision.

On examination his BP is 142/82 mmHg, pulse is 72 and regular. There is bilateral decreased visual acuity and loss of colour vision. The rest of the neurological examination is unremarkable.

Which of the following is most likely to have occurred?

- 1- Cataract formation
- 2- Closed angle glaucoma
- 3- Open angle glaucoma
- 4- Optic neuritis
- 5- Retinal detachment

Answer & Comments

Answer: 4- Optic neuritis

Optic neuritis is described as being rarely associated with diclofenac therapy. A range of other CNS side effects has also been noted on the summary of product characteristics, these include headache, dizziness, vertigo and in rare circumstances drowsiness.

Cataract formation would not lead to loss of colour vision or to a sudden deterioration in sight over the course of a few days.

Glaucoma and retinal detachment are not thought to be associated with diclofenac treatment.



[Q: 2816] OnExamination 2012 - Clinical pharmacology

Which of the following is correct with regard to poisoning / overdose?

- 1- Aspirin causes acidosis due to hypoventilation
- 2- Chlormethiazole causes hyperthermia and hypertension
- 3- Ethylene glycol causes a metabolic alkalosis and renal failure
- 4- Methanol causes a metabolic acidosis with an increased anion gap
- 5- Phenobarbitone causes a metabolic acidosis

Answer & Comments

Answer: 4- Methanol causes a metabolic acidosis with an increased anion gap

Aspirin causes hyperventilation which may result in a respiratory alkalosis; massive overdose may cause a metabolic acidosis.

Phenobarbitone and chlormethiazole both suppress the central nervous system causing hypoventilation, hypotension and hypothermia.

Ethylene glycol causes a metabolic acidosis.

Methanol is metabolised to formaldehyde and formic acid.



[Q: 2817] OnExamination 2012 -
Clinical pharmacology

You are examining the mechanisms of various agents used in either platelet inhibition or anticoagulation in the management of cardiovascular disease.

Which of the following correctly describes a mechanism of action associated with warfarin therapy?

- 1- 2b3a receptor inhibition
- 2- Cyclo-oxygenase inhibition
- 3- P2Y12 inhibition
- 4- Reduced levels of factor X
- 5- Selective COX-2 inhibition

Answer & Comments

Answer: 4- Reduced levels of factor X

Warfarin inhibits production of factors II, VII, IX and X, and it does this by restricting the activity and availability of vitamin K. This accounts for vitamin K administration being the treatment for warfarin toxicity.

2b3a receptor inhibitors are used in the treatment of acute coronary syndrome and they inhibit platelet aggregation.

P2Y12 is an adenosine diphosphate (ADP) dependent receptor involved in platelet aggregation which is inhibited by clopidogrel.

Cyclo-oxygenase inhibition is the mechanism of action of aspirin.

Selective COX-2 inhibitors have fallen out of favour due to potential increased risk of cardiovascular events.



[Q: 2818] OnExamination 2012 -
Clinical pharmacology

A 45-year-old woman presents to the oncology clinic with metastatic carcinoma of the breast.

She wants to take an active role in deciding on the optimal chemotherapy regime for herself, and wants to discuss the relative advantages of capecitabine versus 5-fluorouracil (5-FU).

What would you advise her about capecitabine?

- 1- Can be orally administered
- 2- Has a greater period of progression free survival than 5-FU
- 3- Is associated with less blood dyscrasias than 5-FU
- 4- Is not dependent on renal function
- 5- Is not usually associated with diarrhoea

Answer & Comments

Answer: 1- Can be orally administered

The major difference between capecitabine and 5-FU is that capecitabine is an oral prodrug of 5-FU. The final step in metabolism to 5-FU is thymidine phosphorylase, higher activity of thymidine phosphorylase occurring in tumour tissues.

Evidence suggests that efficacy of capecitabine versus 5-FU is broadly similar, with minor, insignificant differences occurring in progression free survival in comparative studies across a range of primary tumour types.

Whilst activation of capecitabine to 5-FU occurs after a number of steps, metabolites are still renally excreted, so in this sense, no significant advantage over 5-FU is conferred.



[Q: 2819] OnExamination 2012 -
Clinical pharmacology

A patient is suspected of having taken a substance with anticholinesterase effects.

Which of the following combinations of signs, if present, would be the most likely to confirm this effect?

- 1- Bradycardia and miosis

- 2- Bradycardia and mydriasis
- 3- Bradycardia and urinary retention
- 4- Tachycardia and diarrhoea
- 5- Tachycardia and lacrimation

Answer & Comments

Answer: 1- Bradycardia and miosis

An acetylcholinesterase inhibitor or anti-cholinesterase is a chemical that inhibits the cholinesterase enzyme from breaking down acetylcholine (ACh), so increasing both the level and duration of action of the neurotransmitter acetylcholine.

ACh can stimulate postganglionic receptors to produce effects such as salivation, lacrimation, defecation, micturition, sweating, miosis, bradycardia, and bronchospasm. Muscarine produces these effects, and hence they are referred to as muscarinic effects, and the postganglionic receptors are called muscarine receptors. (eMedicine)

SLUD (salivation, lacrimation, urination, defecation [and emesis]) is a syndrome of pathological effects indicative of massive discharge of the parasympathetic nervous system.

Unlikely to occur naturally, SLUD is usually encountered only in cases of drug overdose or exposure to nerve gases. Nerve gases irreversibly inhibit the enzyme acetylcholinesterase; this results in a chronically high level of acetylcholine at cholinergic synapses throughout the body, thus chronically stimulating acetylcholine receptors throughout the body.



[Q: 2820] OnExamination 2012 - Clinical pharmacology

A 60-year-old female suffers from bipolar affective disorder and is being treated with lithium. She also has a long history of hypertension for which she is on treatment.

During a recent clinic visit her blood pressure was noted to be 170/94 mmHg and a new antihypertensive agent was added. A week later she presents with features of lithium toxicity including tremor, nausea and weakness.

The addition of which one of the following drugs was likely to have precipitated the lithium toxicity?

- 1- Doxazosin
- 2- Hydralazine
- 3- Lisinopril
- 4- Minoxidil
- 5- Moxonidine

Answer & Comments

Answer: 3- Lisinopril

The precipitation of lithium toxicity by diuretics is well appreciated. Yet ACE inhibitors [log-in required for full text] and angiotensin antagonists are also capable of precipitating lithium toxicity through reduced lithium clearance.

Other drugs that may precipitate lithium toxicity include

NSAIDs

Tetracycline

Phenytoin

Ciclosporin.



[Q: 2821] OnExamination 2012 - Clinical pharmacology

Which of the following antiemetics functions through inhibition of neurokinin (NK) 1 receptor?

- 1- Aprepitant
- 2- Domperidone
- 3- Hyoscine
- 4- Granisetron

5- Ondansetron

Answer & Comments

Answer: 1- Aprepitant

Aprepitant is a neurokinin receptor blocker used in the prevention of chemotherapy induced nausea.

Ondansetron and granisetron are 5HT₃ antagonists.

Hyoscine is an anticholinergic/antihistaminergic.

Domperidone is an antidopaminergic agent.



[Q: 2822] OnExamination 2012 - Clinical pharmacology

A middle-aged lady presents with cervical and inguinal lymphadenopathy. She is also experiencing pins and needles in a glove and stocking distribution, and has gum hypertrophy. She has a previous history of epilepsy and is on regular medication.

Which of the following drugs is most likely to cause her symptoms?

- 1- Carbamazepine
- 2- Phenobarbitone
- 3- Phenytoin
- 4- Sodium valproate
- 5- Vigabatrin

Answer & Comments

Answer: 3- Phenytoin

Recognised side effects of phenytoin include

Drowsiness

Ataxia

Confusion

Blurred vision

Dizziness

Nystagmus

Permanent cerebellar ataxia

Peripheral neuropathy

Rashes

Gum hypertrophy

Thickening of the facial features

Lymphadenopathy

Chorea

Sleep disturbance.

Remarkable side effects of other anti-epileptic drugs are:

Drowsiness

Blurred vision

Dizziness

Leukopenia

SIADH and rash (carbamazepine)

Liver toxicity (sodium valproate)

Severe rash (lamotrigine)

Retinal damage (vigabatrin)

Aplastic anaemia (felbamate).



[Q: 2823] OnExamination 2012 - Clinical pharmacology

Which term best describes the affinity of a drug for its receptor?

- 1- Efficacy
- 2- Intrinsic activity
- 3- Potency
- 4- Selectivity
- 5- Therapeutic effect

Answer & Comments

Answer: 3- Potency

Affinity is the measure of the net molecular attraction between a drug (or neurotransmitter or hormone) and its receptor.

The receptor's affinity for binding a drug determines the concentration of drug required to form a significant number of drug-receptor complexes.

Affinity and intrinsic activity are determinants of potency.

Efficacy contributes both to potency and to the maximum effect of the agonist. Efficacy is a measure of the efficiency of the drug-receptor complex in initiating the signal transduction process.



[Q: 2824] OnExamination 2012 - Clinical pharmacology

A 16-year-old female is admitted with a severe paracetamol overdose. She is treated with IV N-acetylcysteine (NAC).

By replenishing which of the following compounds does N-acetylcysteine function as an antidote in paracetamol overdose?

- 1- Arginine
- 2- Cysteine
- 3- Cystine
- 4- Glutathione
- 5- Methionine

Answer & Comments

Answer: 4- Glutathione

Paracetamol is predominantly metabolised to glucuronide and sulphate conjugates, which are excreted in the urine.

Hepatotoxicity is related to the conversion of a small proportion of the ingested dose to N-acetyl-p-benzoquinoneimine.

In therapeutic doses N-acetyl-p-benzoquinoneimine is detoxified by

conjugation with glutathione in the liver, but once the protective intracellular glutathione stores are depleted hepatic and renal damage may ensue.

NAC and methionine replenishes glutathione stores in the liver and may also act through its sulphhydryl (-SH) group as a direct reducing agent.



[Q: 2825] OnExamination 2012 - Clinical pharmacology

A 60-year-old retired nurse with idiopathic Parkinson's disease presented with motor oscillations and on-off periods.

She had received co-beneldopa for five years. Selegiline was added to her treatment.

On which one of the following enzymes does selegiline act to cause this adjuvant action?

- 1- Catechol-o-methyltransferase
- 2- Dopa decarboxylase
- 3- Dopamine hydroxylase
- 4- Monoamine oxidase
- 5- Tyrosine hydroxylase

Answer & Comments

Answer: 4- Monoamine oxidase

Selegiline is a MAO-B inhibitor.



[Q: 2826] OnExamination 2012 - Clinical pharmacology

You are asked to see a 42-year-old man who complains of a cough at night. He also tells you that he has wheeze when he has a cold, and he smokes 20 cigarettes per day. He works as a landscaper on a housing development.

On examination his BP is 152/91 mmHg, his pulse is 70 and his BMI is 21. There is no significant wheeze.

You assess him at intermediate risk of having a diagnosis of asthma.

According to BTS guidelines, which FEV₁/FVC ratio triggers asthma therapy?

- 1- 0.5
- 2- 0.6
- 3- 0.7
- 4- 0.8
- 5- 0.9

Answer & Comments

Answer: 3- 0.7

Features described by the BTS guidelines as increasing the likelihood of asthma include

Worse symptoms at night and in the early morning

Nocturnal cough or wheeze

Symptoms after exercise

Allergen exposure

Beta blockers or

Aspirin.

A history of asthma or atopy in the family and wheeze on examination also increase the likelihood of an asthma diagnosis.

Prominent dizziness or tingling of the hands and feet associated with shortness of breath may be a pointer towards hyperventilation, and chronic cough without wheeze is also a pointer against a diagnosis of asthma.

Where the FEV₁/FVC is greater than 0.7, referral for specialist advice is recommended if significant chest disease is suspected.

2011 Asthma guidelines



[Q: 2827] OnExamination 2012 - Clinical pharmacology

Which of the following is not a cause of drug-induced hepatitis?

- 1- Amiodarone

- 2- Ethambutol
- 3- Isoniazid
- 4- Methyldopa
- 5- Pyrazinamide

Answer & Comments

Answer: 2- Ethambutol

Side effects of ethambutol are largely confined to visual disturbances in the form of

Loss of acuity

Colour blindness

Restriction of visual fields.

It does not cause hepatitis and is renally excreted.

Causes of drug-induced hepatitis include

Isoniazid

Amiodarone

Pyrazinamide

Methyldopa.



[Q: 2828] OnExamination 2012 - Clinical pharmacology

A 17-year-old boy is diagnosed with asthma and comes to the clinic for review. He is currently managed with 100 mcg BD of inhaled beclomethasone and salbutamol PRN.

His mother wants to enrol him in a class teaching the Buteyko technique.

What would you advise about its success?

- 1- It is associated with improved FEV₁
- 2- It is associated with improved FVC
- 3- It is associated with improved symptoms
- 4- It should not be recommended to adults who require inhaled steroids
- 5- Patients enrolled tend to use more short acting beta agonists

Answer & Comments

Answer: 3- It is associated with improved symptoms

The Buteyko technique controls chronic hyperventilation, as such patients perceive less symptoms of shortness of breath, and their use of short acting bronchodilators is reduced.

This does not however have any impact on lung function including FEV₁ and FVC.

It may be particularly valuable in patients who complain of symptoms of shortness of breath significantly in excess of those expected when you review their lung function.

British Thoracic Society's asthma guidelines



[Q: 2829] OnExamination 2012 - Clinical pharmacology

A mother brings her 3-year-old child to the casualty department because she is complaining of earache. You collect her from the waiting room where she is happily playing with toys. This is the second episode over the past year.

On examination her temperature is 37.4°C and her right ear drum is pink and bulging consistent with otitis media.

According to the SIGN national guidelines, how will you manage the child?

- 1- Advise paracetamol and or ibuprofen to relieve her pain
- 2- Prescribe clarithromycin for the child and advise her to start it immediately
- 3- Prescribe penicillin V for the child and advise she starts it immediately
- 4- Prescribe penicillin V for the child and advise she starts it in 24 hours if the pain does not improve
- 5- Refer to the ENT surgeons as this is the second episode

Answer & Comments

Answer: 1- Advise paracetamol and or ibuprofen to relieve her pain

Advise her to take paracetamol and or ibuprofen to relieve her pain.

SIGN guidelines point out that in children without significant systemic features of infection such as fever and generalised illness apart from pain, there is no significant benefit of antibiotics. The guidelines state that if all children were treated with antibiotics, then the number needed to treat (NNT) would be 17 to avoid one clinical failure.

Unfortunately practice in the management of otitis media in children varies considerably in children across the world, from 31% in the Netherlands to 98% in the USA and Australia.

Additionally, for a very common condition, the number of well conducted clinical trials is small. This is one area which could have benefited from better randomised controlled trials of antibiotics at the outset, but on available evidence, rationalisation of antibiotic use to guard against the development of resistance is sensible.

Reference:

<http://www.sign.ac.uk/guidelines/fulltext/66/section3.html>



[Q: 2830] OnExamination 2012 - Clinical pharmacology

A 68-year-old man with a history of type 2 diabetes, chronic renal failure and epilepsy is admitted to the emergency department with anorexia, nausea, and increasing lethargy.

He also developed tremor and nystagmus, with truncal ataxia and strange choreoathetoid movements. He takes BD mixed insulin for his diabetes, phenytoin for his epilepsy, ramipril and amlodipine for his hypertension.

On examination his BP is 159/88 mmHg, his pulse is 90. He has bilateral crackles on

auscultation of his chest consistent with fluid overload.

Investigations show

Haemoglobin 10.5 g/dl(13.5-17.7)

White cells $7.8 \times 10^9/L$ (4-11)

Platelets $182 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (135-146)

Potassium 5.7 mmol/l (3.5-5)

Creatinine 231 $\mu\text{mol/l}$ (79-118)

HbA1c 53 mmol/mol(<35)

Phenytoin levels Within the therapeutic range

Which of the following is the most likely reason for his phenytoin toxicity?

- 1- Decreased GI absorption of phenytoin
- 2- Decreased hydroxylation of phenytoin
- 3- Decreased protein binding of phenytoin
- 4- Increased protein binding of phenytoin
- 5- Increased renal cycling of phenytoin metabolites

Answer & Comments

Answer: 3- Decreased protein binding of phenytoin

This patient has renal failure, a state in which drugs that are usually highly protein bound, such as phenytoin, lose some of their affinity for protein binding. This results in increased availability of free drug at any given dose, which then increases the risk of toxicity.

Because laboratory assays for phenytoin usually measure total drug concentration, this gives a degree of false reassurance.

In patients with renal failure, dose reduction of phenytoin is therefore required.

Other drugs where this may be a problem include sodium valproate and warfarin.



[Q: 2831] OnExamination 2012 - Clinical pharmacology

A 45-year-old publican is brought to the Emergency department by ambulance.

He is extremely agitated and says that he can see a number of dogs at the door of the side room and they are barking fiercely. On further questioning his wife tells you that he drinks some eight to ten pints of beer and glasses of wine and whisky each day. They have recently had an argument about his drinking and he has not touched any alcohol for the past 12-18 hours.

On examination he is agitated and sweating, his BP is 145/84 mmHg, his pulse is 85 and regular. He has changes consistent with chronic liver disease and is tender in the right upper quadrant of his abdomen.

Investigations show:

Haemoglobin 10.1 g/dl(13.5-17.7)

White cell count $8.3 \times 10^9/L$ (4-11)

Platelets $151 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 4.0 mmol/l (3.5-5)

Creatinine 90 $\mu\text{mol/l}$ (79-118)

Alanine aminotransferase 92 IU/l (5-40)

Bilirubin 54 $\mu\text{mol/l}$ (<17)

Which of the following is the most likely diagnosis?

- 1- Alcoholic hallucinosis
- 2- Delirium tremens
- 3- Hypomanic episode
- 4- Minor alcohol withdrawal symptoms
- 5- Stimulant overdose

Answer & Comments

Answer: 1- Alcoholic hallucinosis

Alcoholic hallucinosis is known to appear some 12-24 hours after the last alcoholic drink

has been taken and hallucinations may be visual, auditory or tactile in nature.

More minor withdrawal symptoms which patients experience may include

A degree of agitation and restlessness

Sweating

Nausea and vomiting

Feelings of depression.

Withdrawal seizures are seen 24-48 hours after alcohol withdrawal, and two to three days after stopping drinking withdrawal delirium (delirium tremens 'DTs') is seen.

Management includes the use of anti-withdrawal medication such as chlordiazepoxide, and thiamine replacement.



[Q: 2832] OnExamination 2012 - Clinical pharmacology

A 28-year-old car mechanic is admitted to the hospital having taken an overdose of methanol after splitting up from his wife.

On admission to the Emergency department he is drowsy and intoxicated. His BP is 134/82 mmHg, and he has a tachycardia with a pulse of 95.

Investigations show:

Haemoglobin 14.0 g/dl (13.5-17.7)

White cell count $8.1 \times 10^9/L$ (4-11)

Platelets $190 \times 10^9/L$ (150-400)

Serum Sodium 137 mmol/l (135-146)

Serum Potassium 4.2 mmol/l (3.5-5)

Bicarbonate 17 mmol/l (22-30)

Creatinine 130 $\mu\text{mol/l}$ (79-118)

Which of the following is the most appropriate antidote for methanol poisoning?

1- Atenolol

2- Ethanol

3- Glucagon

4- Insulin

5- Polyethylene glycol

Answer & Comments

Answer: 2- Ethanol

Methanol, like ethanol, is metabolised by alcohol dehydrogenase to form formaldehyde. Formaldehyde is then further metabolised by aldehyde dehydrogenase to formic acid.

Formate formation leads to a severe metabolic acidosis, and crystals forming within the eye can lead to so called 'snow field' cataract formation.

Inhibition of metabolism of methanol by alcohol dehydrogenase with either ethanol or fomepizole is the treatment of choice.



[Q: 2833] OnExamination 2012 - Clinical pharmacology

A 38-year-old man is admitted with an hour history of chest pain, confusion and agitation after taking a recreational drug.

On examination, he is confused, has a temperature of 38.3°C and a blood pressure of 188/102 mmHg.

Which of the following drugs is most likely to be responsible for his presentation?

1- Cocaine

2- Ecstasy (MDMA)

3- Gamma hydroxybutyrate (GHB)

4- LSD

5- Opiates

Answer & Comments

Answer: 1- Cocaine

In this scenario, the young male presents with confusion and agitation following drug abuse.

The most likely agent is cocaine.

Through central effects, cocaine induces sweating, pyrexia and also adrenergic mediated hypertension.

It may also be responsible for coronary and cerebral artery spasm causing chest pain and/or infarction.

The main differential for this question would be ecstasy however cocaine is far more likely to present with chest pain and in this age group.



[Q: 2834] OnExamination 2012 - Clinical pharmacology

A 58-year-old male presents with painful breast tissue.

Six weeks previously he was treated for atrial fibrillation and had a number of drugs commenced.

Which one of the following drugs may have caused this problem?

- 1- Aspirin
- 2- Digoxin
- 3- Flecainide
- 4- Spironolactone
- 5- Warfarin

Answer & Comments

Answer: 4- Spironolactone

Digoxin may cause gynaecomastia but usually only on prolonged use.

Spironolactone is well known to cause gynaecomastia due to its well described anti-androgen effects.



[Q: 2835] OnExamination 2012 - Clinical pharmacology

A 70-year-old man presents with an episode of syncope.

On subsequent investigation he is found to have marked postural hypotension. He has

been taking felodipine for hypertension for a number of years and he also takes aspirin. On further questioning he appears to have taken up a new healthier lifestyle on his seventieth birthday.

Which of the following health supplements is he most likely to have taken that would have contributed to the calcium-channel blocker induced hypotension?

- 1- Cod liver oil capsules
- 2- Cranberry juice
- 3- Ginseng
- 4- Grapefruit juice
- 5- Vitamin C

Answer & Comments

Answer: 4- Grapefruit juice

Grapefruit juice interacts with drugs.

The basis for this interaction has been diligently explored and appears to relate to both flavanoid and nonflavanoid components of grapefruit juice interfering with enterocyte CYP3A4 activity.

Of the calcium channel blockers felodipine in particular is affected.

Am J Hypertens (2006) 19: 768-73



[Q: 2836] OnExamination 2012 - Clinical pharmacology

A 30-year-old patient with learning difficulties is admitted as a medical emergency.

The patient complains of headache, anorexia and vomiting.

On examination she is febrile with a temperature of 38°C, pulse 110 bpm and is clinically jaundiced.

Investigations reveal:

Bilirubin 60 µmol/L (1-22)

Albumin 28 g/L (37-49)

AST 400 IU/L(5-40)

Alkaline phosphatase 400 IU/L(45-105)

Prothrombin time 35 seconds(<14)

She was commenced on a new medication within the last three months.

Which do you suspect may be contributing to the presentation?

- 1- Cabergoline
- 2- Carbamazepine
- 3- Lamotrigine
- 4- Metformin
- 5- Sodium valproate

Answer & Comments

Answer: 5- Sodium valproate

Sodium valproate can occasionally have an idiosyncratic response leading to severe or even fatal hepatic toxicity.

This is more common if the patient has a metabolic or degenerative disorder, organic brain disease or severe seizures associated with mental retardation. Usually this reaction occurs within the first three months of therapy.

Carbamazepine can be associated with jaundice occasionally, however the history of mental retardation and short history of drug use point to sodium valproate as the cause.

Lamotrigine can disrupt liver function tests (LFTs).

Metformin and cabergoline do not affect liver function however caution is advised when using these drugs in patients with hepatic disease.



[Q: 2837] OnExamination 2012 - Clinical pharmacology

A 72-year-old woman comes to the emergency department complaining of nausea and vomiting. Apparently she saw the on-call

GP a few days earlier and was prescribed clarithromycin for a respiratory tract infection.

Past medical history of note includes COPD for which she takes high dose Seretide, tiotropium and oral theophylline, ischaemic heart disease for which she takes ramipril, amlodipine and indapamide and chronic renal failure.

On examination her BP is 132/70 mmHg, and her pulse is 105 (atrial fibrillation). She has bibasal crackles consistent with mild LVF.

Investigations show

Haemoglobin 11.4 g/dl11.5-16.5

White cell count $7.0 \times 10^9/L$ 4-11

Platelets $197 \times 10^9/L$ 150-400

Serum Sodium 139 mmol/l135-146

Serum Potassium 4.0 mmol/l3.5-5

Creatinine 145 $\mu\text{mol/l}$ 79-118

Which of the following medications is likely to have resulted in her presentation?

- 1- Amlodipine
- 2- Indapamide
- 3- Ramipril
- 4- Theophylline
- 5- Tiotropium

Answer & Comments

Answer: 4- Theophylline

Clarithromycin is a potent inhibitor of CYP3A4, and as such may interfere significantly with metabolism of a number of medications, including theophylline, simvastatin, and cyclosporine as the most important drug interactions.

The effect of warfarin and digoxin may also be potentiated by clarithromycin.

<http://www.medicines.org.uk/emc/medicine/16945/SPC/#INTERACTIONS>



[Q: 2838] OnExamination 2012 -
Clinical pharmacology

A 33-year-old woman with a history of alcoholism and self-neglect, presents with an episode of blood streaked vomiting. This is attributed to minor Mallory-Weiss tear.

She is admitted to hospital and given an intravenous infusion of 5% dextrose. Her serum potassium concentration is noted the following day to have fallen to 1.9 mmol/L (3.5-4.9) on admission.

What is the likely mechanism for the fall in potassium concentration?

- 1- Cortisol release in response to stress increasing renal potassium loss
- 2- Decompensated liver failure causing aldosterone secretion
- 3- Intracellular re-uptake in response to re-feeding with glucose
- 4- Metabolic acidosis increasing renal potassium excretion
- 5- Potassium levels falling following gastric loss in vomiting

Answer & Comments

Answer: 3- Intracellular re-uptake in response to re-feeding with glucose

This neglected person is being fed with dextrose, which will cause an elevation of circulating insulin to maintain glycaemic control.

This will consequently drive potassium intracellularly so reducing extracellular potassium concentration.



[Q: 2839] OnExamination 2012 -
Clinical pharmacology

A 64-year-old gentleman consults you in clinic because he is having trouble putting his shoes on due to swelling.

He has COPD, hypertension and angina.

Which medication is likely to be causing this problem?

- 1- Diltiazem
- 2- Eplerenone
- 3- Isosorbide mononitrate
- 4- Nicorandil
- 5- Propranolol

Answer & Comments

Answer: 1- Diltiazem

Diltiazem, as with nearly all the calcium channel blockers, causes gravitational/ankle oedema.

Eplerenone is an aldosterone antagonist and therefore is used to treat ankle oedema.

Isosorbide mononitrate commonly causes headaches and hypotension.

Nicorandil rarely causes angioedema, but not ankle swelling.

Propranolol does not cause ankle oedema although it may worsen decompensated heart failure, so is usually avoided until the patient has been diuresed appropriately.



[Q: 2840] OnExamination 2012 -
Clinical pharmacology

A 72-year-old woman comes to the Emergency department.

She takes warfarin, an anticoagulant for chronic atrial fibrillation, and is usually on a stable warfarin dose of 5 mg every morning. She has had a number of trips to the GP over past weeks for management of her hypertension, a respiratory tract infection, and for treatment of depression.

On examination her BP is 142/72 mmHg, her pulse is 80 bpm and regular, she has extensive bruising over her arms and legs.

Investigations show:

Haemoglobin 13.1 g/dl 11.5-16.5

White cell count $8.1 \times 10^9/L$ 4-11

Platelets $160 \times 10^9/L$ 150-400

Serum Sodium 140 mmol/l 135-146

Serum Potassium 4.7 mmol/l 3.5-5

Creatinine 106 $\mu\text{mol/l}$ 79-118

INR 6.12-3

Which of the following medications is most likely to have caused an increased propensity to bruising?

- 1- Azithromycin
- 2- Digoxin
- 3- Fluoxetine
- 4- Ramipril
- 5- Simvastatin

Answer & Comments

Answer: 3- Fluoxetine

Warfarin is subject to both pharmacodynamic and pharmacokinetic interactions which may lead to increased INR.

Pharmacodynamic interactions are those which may increase the propensity to bleeding without actually altering the absorption, metabolism, distribution or excretion of warfarin. Examples include concomitant use of clopidogrel or aspirin in combination with warfarin, or concomitant use of acute therapies like 2b3a receptor antagonists.

Pharmacokinetic interactions are those which impact on the absorption, metabolism, distribution or excretion of the drug.

Fluoxetine is a CYP450 enzyme inhibitor. Both inhibitors and inducers of CYP450 enzymes may lead to changes in the anti-coagulant effect of warfarin.

Co-prescription of antibiotics often inadvertently leads to increases in INR; examples of antibiotic P450 inhibitors include clarithromycin and erythromycin.



[Q: 2841] OnExamination 2012 - Clinical pharmacology

A 71-year-old man with a history of hypertension, type 2 diabetes and erectile dysfunction comes to the clinic for review complaining of blue vision.

He takes amlodipine and ramipril for hypertension, digoxin for atrial fibrillation, sitagliptin and metformin for diabetes, and sildenafil for erectile dysfunction.

Which of the following is most likely to be responsible for his blue vision?

- 1- Amlodipine
- 2- Digoxin
- 3- Metformin
- 4- Sildenafil
- 5- Sitagliptin

Answer & Comments

Answer: 4- Sildenafil

Digoxin is associated with yellow/green visual disturbance.

Sildenafil is a PDE-5 inhibitor, but at high dose it inhibits the activity of PDE-6, which is essential for the functioning of retinal rods cells. Inhibition of the enzyme leads to patients reporting blue tinged vision, particularly in low light conditions.

The condition may be improved by reducing the dose of sildenafil, but of course this may limit efficacy with respect to improving erectile dysfunction.



[Q: 2842] OnExamination 2012 - Clinical pharmacology

A 24-year-old female who has previously suffered with severe depression presents with secondary amenorrhoea.

She is found to have a prolactin of 645 mU/L (normal 50-350).

Which of the drugs which she takes may cause this?

- 1- Becotide
- 2- Montelukast
- 3- Omeprazole
- 4- Risperidone
- 5- Sertraline

Answer & Comments

Answer: 4- Risperidone

Antipsychotic medications are known to elevate prolactin levels, due to dopamine antagonist effects.

Sertraline is not thought to exert dopamine antagonist effects and thus does not result in hyperprolactinaemia.

The other medications on her list have not been associated with hyperprolactinaemia.



[Q: 2843] OnExamination 2012 - Clinical pharmacology

A 48-year-old man is admitted with nausea and excessive drowsiness after taking an antihistamine tablet. He has previously used the antihistamine but on this occasion he has recently been drinking large amounts of grapefruit juice for his health.

Grapefruit juice is suspected of causing a drug interaction in this man.

Which of the following liver enzyme systems is affected by grapefruit juice?

- 1- Cytochrome p450 3A4
- 2- Glucuronidation
- 3- Glutathione S-transferase
- 4- Glycine decarboxylase
- 5- Sulfation

Answer & Comments

Answer: 1- Cytochrome p450 3A4

Bergamottin is a constituent of grapefruit juice and is metabolised by the cytochrome p450 3A4 pathway.



[Q: 2844] OnExamination 2012 - Clinical pharmacology

Which of the following are centrally acting antihypertensive therapies?

- 1- Hydralazine
- 2- Minoxidil
- 3- Moxonidine
- 4- Phenoxybenzamine
- 5- Verapamil

Answer & Comments

Answer: 3- Moxonidine

Moxonidine and alpha-methyl dopa are centrally acting antihypertensives and modify blood pressure through central action modifying sympathetic activity.

Verapamil is a calcium antagonist, minoxidil and hydralazine both vasodilators and phenoxybenzamine an alpha blocker.



[Q: 2845] OnExamination 2012 - Clinical pharmacology

Which of the following pharmacological agents acts through the opening of potassium channels?

- 1- Amiloride
- 2- Glibenclamide
- 3- Lidocaine
- 4- Nicorandil
- 5- Phenytoin

Answer & Comments

Answer: 4- Nicorandil

Nicorandil is a potent potassium channel activator. It relaxes vascular smooth muscle

through membrane hyperpolarisation via increased transmembrane potassium conductance and, like nitrates, through an increase in intracellular cyclic guanosine monophosphate (GMP).

Glibenclamide blocks potassium channels.

Amiloride inhibits the action of aldosterone on the distal convoluted tubule producing potassium reabsorption.



[Q: 2846] OnExamination 2012 - Clinical pharmacology

A 22-year-old male is admitted after drinking engine coolant in an apparent suicide attempt after finding his wife in bed with the postman.

Investigations reveal:

pH 7.1(7.36-7.44)

pO₂ 15.3 kPa(11.3-12.6)

pCO₂ 3.2 kPa(4.7-6.0)

Standard Bicarbonate 2.2 mmol/L(20-28)

Serum calcium 1.82 mmol/L(2.2-2.6)

After replacing calcium which of the following is the most urgent treatment for this man?

- 1- 8.4% bicarbonate infusion
- 2- Alcohol infusion
- 3- Fomepizole infusion
- 4- Gastric lavage
- 5- Haemodialysis

Answer & Comments

Answer: 1- 8.4% bicarbonate infusion

Engine coolant contains ethylene glycol. Ingestion of as little as 30-60 ml is capable of causing death.

Traditional management of poisoning includes the use of ethanol, with or without haemodialysis.

Activated charcoal is not indicated and gastric lavage may be beneficial only in the first hour after ingestion.

However fomepizole has recently been approved for use and is a competitive inhibitor of alcohol dehydrogenase. However it is very expensive and the evidence supporting its use over alcohol is lacking. Also, this patient already has a severe metabolic acidosis.

In these circumstances, antidotal therapy to block alcohol dehydrogenase with ethanol or 4-MP alone is insufficient to treat the poisoning. Data suggest that a severe lactic acidosis needs initial correction and in this patient the most appropriate treatment would be IV fluids with bicarbonate to correct the metabolic acidosis.

Then haemodialysis is probably required.



[Q: 2847] OnExamination 2012 - Clinical pharmacology

A 42-year-old man presents with gingival hypertrophy.

Which of his cardiac medications is likely to be responsible?

- 1- Amlodipine
- 2- Atenolol
- 3- Digoxin
- 4- GTN
- 5- Simvastatin

Answer & Comments

Answer: 1- Amlodipine

Calcium channel blockers and drugs like phenytoin and cyclosporin are associated with gingival hypertrophy.



[Q: 2848] OnExamination 2012 -
Clinical pharmacology

A 76-year-old man is reviewed in clinic having recently been diagnosed with severe heart failure (HF) associated with very limiting breathlessness. He was formerly a heavy smoker with a medical history of COPD. His lung function test demonstrates mild to moderate obstructive airways disease and he has 5% airways reversibility.

On clinical examination his heart rate is 95 bpm and BP 156/90 mmHg. No wheeze is present. He has an elevated JVP +5 cms but no clinical signs of fluid congestion. He is already taking aspirin 75 mg od, ramipril 10 mg od, furosemide 40 mg od and simvastatin 40 mg nocte.

You decide to add in a beta-blocker as the next step.

Which would be the most appropriate choice?

- 1- Atenolol 25 mg od
- 2- Bisoprolol 5 mg od
- 3- Bisoprolol 1.25 mg od
- 4- Carvedilol 6.25 mg bd
- 5- Carvedilol 12.5 mg bd

Answer & Comments

Answer: 3- Bisoprolol 1.25 mg od

NICE recommends β blockers in all HF patients.

In chronic obstructive pulmonary disease (COPD) patients with HF, cardioselective β blockers appear safer at lower doses than higher doses or non-selective β blockers (refs in DTB article).

Bisoprolol 5 mgs is too high an initial starting dose, a low dose can always be titrated up later, if tolerated.

Carvedilol though effective treatment for heart failure is not selective and therefore

carries a greater risk of causing bronchospasm.

Atenolol though cardioselective has no clinical evidence for prognostic benefit in heart failure.

The patient should be closely monitored for deterioration in lung function post-administration.



[Q: 2849] OnExamination 2012 -
Clinical pharmacology

A 63-year-old female presents with dry mouth of three months duration.

She is taking medication for hypertension, stress incontinence and reflux oesophagitis.

Which of the following may be responsible for her dry mouth?

- 1- Bendroflumethiazide
- 2- Cimetidine
- 3- Doxazosin
- 4- Hydralazine
- 5- Oxybutinin

Answer & Comments

Answer: 5- Oxybutinin

Oxybutinin is an effective treatment for detrusor instability and is a parasympathetic muscarinic antagonist. Consequently dry mouth is a problem in up to 70% of cases.

Bendroflumethiazide, the thiazide diuretic, at a dose of 2.5 mg per day is not associated with dry mouth.

Cimetidine is an H₂ antagonist and is not associated with dry mouth.



[Q: 2850] OnExamination 2012 -
Clinical pharmacology

A 42-year-old woman was taking an antibiotic for a urinary tract infection when she suffered a left Achilles tendon rupture whilst playing

badminton. She is very fit, exercising and doing stretching work up to four times per week, and feels the antibiotic may have been responsible.

Which of the following antibiotics is the most likely cause?

- 1- Amoxicillin
- 2- Cephalexin
- 3- Co-amoxiclav
- 4- Ofloxacin
- 5- Trimethoprim

Answer & Comments

Answer: 4- Ofloxacin

The whole class of quinolone antibiotics is associated with case reports of tendon rupture. This may in part be related to decreased cellular proliferation and tendon fibroblast turnover.

In animal models where quinolones are continued post tendon rupture, it is associated with delayed healing.

Juvenile toxicity models also show increased rates of tendon abnormalities, and for this reason use of quinolones is not recommended in children or in pregnancy.



[Q: 2851] OnExamination 2012 - Clinical pharmacology

A 75-year-old patient being treated for heart failure presents with hyperkalaemia, the potassium being 6.9 mmol/l (NR 3.5-5.0).

He was recently commenced on amiloride.

The interaction of amiloride with which of his drugs listed below is likely to have caused the hyperkalaemia?

- 1- Bisoprolol
- 2- Digoxin
- 3- Metolazone
- 4- Perindopril

5- Warfarin

Answer & Comments

Answer: 4- Perindopril

The co-administration of a potassium-sparing diuretic and an ACE inhibitor, in this case perindopril, may result in profound hyperkalaemia as has occurred in this patient.

Thus patients on both these drugs should have their potassium monitored closely.

Metolazone may result in profound hypokalaemia.



[Q: 2852] OnExamination 2012 - Clinical pharmacology

This symbol appears next to a drug in the BNF.

What does this signify?

- 1- A drug less suitable for prescribing
- 2- A drug that requires closer surveillance for possible side effects
- 3- Controlled drug
- 4- Over the counter medication
- 5- Prescription only therapy

Answer & Comments

Answer: 1- A drug less suitable for prescribing

This symbol indicates those preparations that are considered by the Joint Formulary Committee to be less suitable for prescribing.

Although such preparations may not be considered first choice agents their use may be justifiable in certain circumstances.



[Q: 2853] OnExamination 2012 - Clinical pharmacology

This symbol appears next to a drug that you have looked up in the BNF:

What does this signify?

- 1- Not available for prescription on the NHS

- 2- Not recommended for NHS use
- 3- Only available for specialist use and not for the wider NHS use
- 4- Over the counter only therapy
- 5- Specialist licence required for prescription on the NHS

Answer & Comments

Answer: 1- Not available for prescription on the NHS

This symbol signifies that the drug is not available for NHS prescription but may be available as a private script.



[Q: 2854] OnExamination 2012 - Clinical pharmacology

Which of the following antiemetics functions as a cholinergic muscarinic antagonist?

- 1- Aprepitant
- 2- Domperidone
- 3- Hyoscine
- 4- Metoclopramide
- 5- Ondansetron

Answer & Comments

Answer: 3- Hyoscine

Scopolamine is named after the genus Scopolia.

The name 'hyoscine' is from the scientific name for henbane, Hyoscyamus niger.

It acts as a competitive antagonist at muscarinic acetylcholine receptors; it is thus classified as an anticholinergic or as an antimuscarinic drug.



[Q: 2855] OnExamination 2012 - Clinical pharmacology

Which of the following antiemetics functions through antagonism of the 5-

hydroxytryptamine 3A receptor?

- 1- Aprepitant
- 2- Domperidone
- 3- Hyoscine
- 4- Metoclopramide
- 5- Ondansetron

Answer & Comments

Answer: 5- Ondansetron

Ondansetron is a serotonin 5-HT₃ receptor antagonist used mainly to treat nausea and vomiting following chemotherapy.

Its effects are thought to be on both peripheral and central nerves. One part is to reduce the activity of the vagus nerve, which is a nerve that activates the vomiting center in the medulla oblongata, the other is a blockage of serotonin receptors in the chemoreceptor trigger zone.

It does not have much effect on vomiting due to motion sickness.

This drug does not have any effect on dopamine receptors or muscarinic receptors.



[Q: 2856] OnExamination 2012 - Clinical pharmacology

A 17-year-old boy is admitted with a severe paracetamol overdose following an argument with his girlfriend.

He is treated with intravenous N-acetylcysteine.

Paracetamol is normally metabolised to harmless compounds except in overdose.

Which of the following compounds is the toxic metabolite that accumulates during paracetamol overdose and is reduced by treatment with N-acetylcysteine?

- 1- Glucuronide
- 2- Homocysteine
- 3- Methionine

4- N-acetyl-p-benzoquinoneimine

5- N-hydroxyacetaminophen

Answer & Comments

Answer: 4- N-acetyl-p-benzoquinoneimine

Paracetamol is predominantly metabolised to glucuronide and sulphate conjugates which are excreted in the urine.

Hepatotoxicity is related to the conversion of a small proportion of the ingested dose to N-acetyl-p-benzoquinoneimine. In therapeutic doses N-acetyl-p-benzoquinoneimine is detoxified by conjugation with glutathione in the liver, but once the protective intracellular glutathione stores are depleted hepatic and renal damage may ensue.

NAC and methionine replenish glutathione stores in the liver and may also act through its sulphhydryl (-SH) group as a direct reducing agent.



[Q: 2857] OnExamination 2012 - Clinical pharmacology

A 16-year-old female is admitted after taking an overdose of her mother's propranolol tablets approximately two hours ago.

On examination she is drowsy and has a pulse of 40 beats per minute with a blood pressure of 80/40 mmHg. She is treated with activated charcoal, IV fluids and IV atropine but her bradycardia and hypotension fail to respond.

Which of the following would be the most appropriate next stage in her management?

- 1- IV adrenaline
- 2- IV amiodarone
- 3- IV glucagon
- 4- IV phenytoin
- 5- Insertion of temporary pacemaker

Answer & Comments

Answer: 3- IV glucagon

In those in whom initial atropine is unsuccessful, IV glucagon is a recommended treatment for β -blocker overdose, with some evidence indicating improvement in bradycardia and blood pressure.



[Q: 2858] OnExamination 2012 - Clinical pharmacology

You are asked to advise on analgesia for a 44-year-old woman with acute intermittent porphyria who has undergone wisdom teeth extraction.

Which of the following drugs is safe for use in her treatment?

- 1- Cephalexin
- 2- Cetirizine
- 3- Diclofenac
- 4- Erythromycin
- 5- Ibuprofen

Answer & Comments

Answer: 5- Ibuprofen

Many drugs may induce acute porphyric crises thus great care must be taken when prescribing for patients with acute porphyria.

Drugs unsafe for use in acute porphyria include:

- Barbiturates
- Tricyclic antidepressants
- Monoamine oxidase inhibitor (MAOIs)
- Amphetamines
- Anabolic steroids
- Hormone replacement therapy
- Benzodiazepines
- Diuretics
- Captopril
- Cephalosporins
- Erythromycin
- Isoniazid
- Sulphonamides

Sulphonylureas
Theophylline
Antihistamines
Nifedipine
Verapamil
Amiodarone
Simvastatin.

Ibuprofen is safe for use in acute intermittent porphyria, but diclofenac should be avoided.



[Q: 2859] OnExamination 2012 -
Clinical pharmacology

This symbol appears next to a drug in the BNF:

What does it signify?

- 1- Clinical directive needs to be entered on the prescription to facilitate prescription
- 2- Clinically licensed practitioners only can prescribe this drug
- 3- Control dependent prescribing by licensed practitioners only
- 4- Controlled dispensing from certain pharmacies only
- 5- Controlled drug requiring licensed prescribing

Answer & Comments

Answer: 5- Controlled drug requiring licensed prescribing

The CD symbol signifies a controlled drug, that is, a substance which when requested must be on a prescription signed and dated by a qualified practitioner and specify the prescriber's address.

Also the prescriber must write in his own handwriting the name and address of the patient, the preparation; dose - the total quantity to be prescribed in figures and words; also if prescribed by a dentist then it should state 'for dental use only'.

Such substances include opiates.



[Q: 2860] OnExamination 2012 -
Clinical pharmacology

An 18-year-old woman is admitted after taking drugs at a night club.

Which of the following features suggest she had taken ecstasy (MDMA)?

- 1- A pyrexia of 40°C
- 2- Hypernatraemia
- 3- Hypokalaemia
- 4- Metabolic acidosis
- 5- Respiratory depression

Answer & Comments

Answer: 1- A pyrexia of 40°C

The following are features of the amphetamine MDMA abuse:

Hyponatraemia
Tachycardia
Hyperventilation and
Hyperthermia.



[Q: 2861] OnExamination 2012 -
Clinical pharmacology

You are discussing the optimal medication for use in a patient who needs to withdraw from heroin. He seems motivated and would like to try tablet therapy. He failed to stay clean during the last month, having used street heroin on up to five occasions.

Which of the following is the most appropriate agent for him to combat symptoms of withdrawal?

- 1- Buprenorphine
- 2- Buprenorphine and naloxone combination tablets
- 3- Codeine phosphate
- 4- Dihydrocodeine
- 5- Morphine

Answer & Comments

Answer: 2- Buprenorphine and naloxone combination tablets

Buprenorphine is a partial opiate agonist which binds mu and kappa opiate receptors in the brain. A partial agonist occupies and modulates the receptor without exerting the euphoric effects that would be gained by injecting IV heroin, a full agonist, because it does not exert the full effect.

Naloxone is an opioid antagonist which binds at mu opioid receptors. This means that it blocks the action of opioid agonists such as morphine.

The purpose of combining buprenorphine and naloxone for the treatment of opioid action is that it prevents addicts from achieving a high if they try to create an IV preparation from the tablets for injection.



[Q: 2862] OnExamination 2012 - Clinical pharmacology

A 53-year-old woman is started on a capecitabine based regime for the treatment of metastatic carcinoma.

Which of the following is true of capecitabine?

- 1- Diarrhoea is rarely seen with therapy
- 2- It is a way to deliver cisplatin orally
- 3- It is a way to deliver 5 fluorouracil orally
- 4- It is not effective in the treatment of colon carcinoma
- 5- Capecitabine is more effective than IV agents

Answer & Comments

Answer: 3- It is a way to deliver 5 fluorouracil orally

The answer is option C, it is a way to deliver 5 fluorouracil orally.

Capecitabine is a prodrug which is metabolised to produce 5-fluorouracil, a chemotherapeutic agent used intravenously in the treatment of cancer.

Damage to rapidly dividing cells in the gastrointestinal tract leads to symptoms of diarrhoea and vomiting as a result of capecitabine treatment.

Studies of efficacy suggest no major differences in clinical remission when capecitabine is compared to 5-fluorouracil given IV.



[Q: 2863] OnExamination 2012 - Clinical pharmacology

A patient is treated with hydralazine for the management of her blood pressure. Unfortunately she suffers profound hypotension after only five doses of medication.

Which of the following characteristics does she most likely possess?

- 1- CYP 2D6 polymorphism
- 2- Fast acetylation
- 3- HLA-DR2 genotype
- 4- G6-PD deficiency
- 5- Slow acetylation

Answer & Comments

Answer: 5- Slow acetylation

Slow acetylators often experience toxicity from drugs such as isoniazid, sulfonamides, procainamide, and hydralazine, whereas fast acetylators may not respond to isoniazid and hydralazine in the management of tuberculosis and hypertension.

Sulphonamides are now rarely used due to problems with blood dyscrasias.

Patients with G6-PD deficiency suffer from toxicity when they are prescribed drugs which

are also oxidising agents, such as anti-malarials.



[Q: 2864] OnExamination 2012 - Clinical pharmacology

A 49-year-old woman with a history of hypertension comes to the clinic for review.

She has noticed that she has become jaundiced and is concerned one of her medications may be responsible. She has recently had a second anti-hypertensive added to her regime, and is taking an antibiotic for a respiratory tract infection.

Investigations show

Haemoglobin 12.3 g/dl(11.5-16.0)

White cell count $6.2 \times 10^9/L$ (4-11)

Platelets $195 \times 10^9/L$ (150-400)

Serum Sodium 138 mmol/l (135-146)

Serum Potassium 4.0 mmol/l (3.5-5)

Creatinine 105 $\mu\text{mol/l}$ (79-118)

Alanine aminotransferase 85 U/l (5-40)

Alkaline phosphatase 420 U/l (39-117)

Bilirubin 189 $\mu\text{mol/l}$ (<17)

Which of the following medications is the most likely cause?

- 1- Amlodipine
- 2- Co-amoxiclav
- 3- Enalapril
- 4- Paracetamol
- 5- Penicillin V

Answer & Comments

Answer: 2- Co-amoxiclav

Amoxicillin clavulanate is an important cause of cholestatic jaundice.

Other common drugs associated with cholestatic jaundice include:

Chlorpromazine

Ciprofloxacin

Ofloxacin

Cimetidine

Phenytoin

Naproxen

Captopril

Erythromycin

Azithromycin.

In this case the co-amoxiclav should be withdrawn, and the combination avoided in future.

Because of cholestatic jaundice, prescription of co-amoxiclav is not recommended for longer than 14 days.



[Q: 2865] OnExamination 2012 - Clinical pharmacology

A 45-year-old female is admitted with fatigue, nausea and weight loss.

She is known to have abused alcohol for many years and has previously developed delirium tremens. She stopped drinking alcohol two days ago.

On examination, she is thin, alert and orientated. She is slightly icteric, with features of chronic liver disease but there is no flapping tremor.

Pulse is 88 bpm regular, blood pressure is 106/74 mmHg and temperature is 37°C. She is treated with IV thiamine.

Which of the following agents would be recommended for the prevention of acute alcohol withdrawal?

- 1- IM haloperidol
- 2- IV diazepam
- 3- Oral diazepam
- 4- Oral quetiapine
- 5- No preventative treatment required.

Answer & Comments

Answer: 3- Oral diazepam

This patient with features of alcoholic chronic liver disease would be regarded at high risk of developing acute alcohol withdrawal, particularly in view of her past history of delirium tremens.

Benzodiazepines are appropriate agents in preventing acute alcohol withdrawal and oral agents such as lorazepam and diazepam are recommended.



[Q: 2866] OnExamination 2012 - Clinical pharmacology

A 62-year-old male presented to the urologists with symptoms of urinary hesitancy and dribbling.

They diagnose benign prostatic hyperplasia and he is commenced on finasteride.

Through which of the following mechanisms does finasteride function?

- 1- 5-alpha-reductase inhibitor
- 2- Alpha receptor antagonist
- 3- LHRH analogue
- 4- LHRH antagonist
- 5- Testosterone receptor antagonist

Answer & Comments

Answer: 1- 5-alpha-reductase inhibitor

Finasteride is a 5-alpha-reductase inhibitor preventing the conversion of testosterone to the active dihydrotestosterone (DHT).

Consequently this agent opposes testosterone, so gynaecomastia and reduced libido are common side effects.

It is also taken orally (under the brand name Propecia) for the treatment of male pattern hair loss.



[Q: 2867] OnExamination 2012 - Clinical pharmacology

What does this symbol signify?

- 1- Controlled drug
- 2- Intense monitoring required for any adverse events
- 3- Medication only available as prescription by licensed practitioner
- 4- Pharmacist prescribable drug
- 5- Prescribing can be optional and medication can be obtained over the counter

Answer & Comments

Answer: 3- Medication only available as prescription by licensed practitioner

Prescription Only Medicine - POM - and can be prescribed only by licensed medical or dental practitioners.



[Q: 2868] OnExamination 2012 - Clinical pharmacology

A 29-year-old man who is a keen amateur photographer with his own development studio presented to the Emergency department with confusion. His partner said he had been under a great deal of stress recently and she found him foolishly drinking a developer solution with a poison symbol on it. He is hypoxic and hypotensive.

The local poisons unit suggests a diagnosis of cyanide poisoning.

Which of the following would be the most appropriate treatment?

- 1- Desferrioxamine
- 2- Dicobalt EDTA
- 3- Gastric lavage with Fuller's earth
- 4- Haemodialysis
- 5- Penicillamine

Answer & Comments

Answer: 2- Dicobalt EDTA

Potassium ferricyanide is used chiefly for blueprints in photography, for staining wood, in calico printing, and in electroplating.

Kelocyanor (dicobalt EDTA), given by intravenous injection has been proven to be of use when administered to seriously ill victims of confirmed cyanide poisoning. It is itself toxic, however, and can kill if used wrongly.

HSE knows of several cases of inappropriate use resulting in hospital treatment. Its administration is beyond the scope of first aid and a recommendation has been made in the past that a 'Kelocyanor kit' should be kept by users of cyanide and transported to hospital with the patient.

Unfortunately we are aware of cases where this has misled doctors to treat patients for cyanide poisoning when this diagnosis was not correct.

UK guidelines for the first aid of cyanide poisoning.



[Q: 2869] OnExamination 2012 - Clinical pharmacology

A 59-year-old male presents with a three day history of marked muscle aches and weakness.

He has ischaemic heart disease for which he takes a number of drugs including simvastatin and has been taking these drugs for a number of years without any problem. On this occasion his CPK confirms a diagnosis of rhabdomyolysis with a level of 4200 iu/l (<200).

Which of the following health supplements is he most likely to have taken that would have contributed to the statin-induced rhabdomyolysis?

- 1- Cod liver oil capsules
- 2- Cranberry juice

- 3- Ginseng
- 4- Grapefruit juice
- 5- Vitamin C

Answer & Comments

Answer: 4- Grapefruit juice

Grapefruit juice significantly increases serum concentrations of some statins. This is achieved by reducing the CYP3A4-mediated first-pass metabolism in the small intestine. Concomitant use of atorvastatin and large amounts of grapefruit juice should be avoided, or the dose of atorvastatin should be reduced accordingly. CYP3A4 is a member of the cytochrome P450 system.

Whilst an interaction is increasingly being recognised between cranberry juice and warfarin, there has as yet been no interaction with other drugs metabolised via the P450 system.

No interaction has been shown between statins, omega-3 fish oils, ginseng or vitamin C



[Q: 2870] OnExamination 2012 - Clinical pharmacology

A 58-year-old woman presented with unsteadiness and ataxia and gave a recent history of nausea and epigastric pain for which she had been prescribed an antacid and cimetidine.

She was an epileptic and had been well controlled with phenytoin for eight years. She had been also been prescribed amitriptyline for depression, was receiving post-menopausal hormone replacement therapy and was self-medicating with St John's wort.

Which of the following drugs is most likely to be responsible for her presentation?

- 1- Amitriptyline
- 2- Antacid
- 3- Cimetidine

4- Estradiol

5- St John's wort

Answer & Comments

Answer: 3- Cimetidine

This patient has developed phenytoin toxicity which has been precipitated by cimetidine which inhibits cytochrome P450 metabolism of phenytoin.

Phenytoin concentration is reduced by St John's wort and is unaffected by amitriptyline which would however reduce seizure threshold; antacids may reduce phenytoin absorption and oestradiol metabolism may be increased by phenytoin.



[Q: 2871] OnExamination 2012 - Clinical pharmacology

A 72-year-old man presents with painful lumps in his feet and is diagnosed with gout.

Following initial treatment with nonsteroidal anti-inflammatory agents he is started on allopurinol.

How does this work?

- 1- Increases urinary uric acid excretion
- 2- Inhibits cyclooxygenase II
- 3- Inhibits macrophage tubular formation
- 4- Inhibits nitric oxide synthase
- 5- Inhibits xanthine oxidase

Answer & Comments

Answer: 5- Inhibits xanthine oxidase

Allopurinol inhibits xanthine oxidase, the enzyme involved in the conversion of purines into uric acid.



[Q: 2872] OnExamination 2012 - Clinical pharmacology

A 16-year-old boy reports palpitations, excessive sweating and tremor occurring

almost daily when he walks past a car park where he was mugged four weeks ago.

He is finding the symptoms very troublesome and has started missing school to avoid the car park.

Which of the following psychiatric illnesses does he have?

- 1- Adjustment disorder
- 2- Agoraphobia
- 3- Anorexia nervosa
- 4- Cynophobia
- 5- Generalised anxiety disorder

Answer & Comments

Answer: 1- Adjustment disorder

Adjustment disorder occurs within three months of an identifiable stressor and lasts six months from the withdrawal of the stressor. The patient will show either distress in excess of that expected or a disruption of their day to day life.

The criteria for diagnosing generalised anxiety disorder are anxiety/tension, occasionally accompanied by physical symptoms, on more days than not for more than six months. It is more a diagnosis of exclusion however, as it may be due to prescription medication or another psychiatric illness.

Anxiety disorders can be treated with selective serotonin reuptake inhibitors (SSRIs) or monoamine oxidase inhibitor (MAOI).

Benzodiazepines and beta blockers can be used on a PRN basis for patients who suffer with panic attacks.

Cognitive behavioural therapy can also be of help.

Anorexia nervosa is an eating disorder with altered body image.

Agoraphobia is phobia of open spaces.

Cynophobia is phobia of dogs.



[Q: 2873] OnExamination 2012 -
Clinical pharmacology

A 68-year-old woman comes to the cardiology clinic for review.

She complains of pitting oedema of both ankles and is concerned that some of her medication for heart disease or hypertension may be responsible.

On examination her blood pressure is 142/72 mmHG, pulse is 78 and regular. Her chest is clear, but there is pitting oedema of both lower legs, which she says gets worse towards the end of each day.

Which of the following medications is most likely to be responsible?

- 1- Diltiazem
- 2- Isosorbide dinitrate
- 3- Indapamide
- 4- Nicorandil
- 5- Ramipril

Answer & Comments

Answer: 1- Diltiazem

Diltiazem, like dihydropyridine calcium channel antagonists is associated with ankle swelling due to peripheral venous dilatation.

Swelling is seen to worsen during the course of the day, and is recognised to improve when patients keep their legs up.

Peripheral oedema is not a common problem in patients prescribed nitrates such as isosorbide dinitrate or nitrate donors such as nicorandil.

It is not reported with indapamide, a thiazide-like diuretic, or with ramipril, an ACE inhibitor.



[Q: 2874] OnExamination 2012 -
Clinical pharmacology

A 22-year-old woman attends the GP concerned that she has a positive pregnancy

test. She maintains that she never missed a pill over the course of the last three months.

Which of the following, when taken concurrently with the combined contraceptive pill, is most likely to increase the risk of pregnancy?

- 1- Cimetidine
- 2- Erythromycin
- 3- Fluconazole
- 4- Fluoxetine
- 5- St John's wort

Answer & Comments

Answer: 5- St John's wort

St John's wort is a potent CYP-450 inducer, and use can lead to rapid decreases in sex steroids administered as the combined pill.

Fluconazole is a 2C9 inhibitor

Fluoxetine a 2C19 inhibitor

Erythromycin a 3A4 inhibitor

Cimetidine an inhibitor of 1A2 and 2D6.

As such all four of the other potential choices should not affect contraceptive effectiveness because they do not lead to a decrease in sex steroid levels.

Potent enzyme inducers which may cause significantly decreased pill effectiveness include rifampicin and carbamazepine.

Other antibiotics such as the tetracyclines which may be used in this population for example in the treatment of acne, are known to lead to decreased pill efficacy.



[Q: 2875] OnExamination 2012 -
Clinical pharmacology

A 74-year-old woman with chronic renal failure is admitted to the unit with infective endocarditis. You elect to begin treatment with IV benzylpenicillin and gentamicin.

On examination her temperature is 38.2°C, and she has a pansystolic murmur loudest at the left sternal edge, her BP is 125/82 mmHg, her pulse is 80 bpm and regular and she weighs 80 kg.

Investigations show

Haemoglobin 10.5 g/dl 11.5-16.5

White cell count $7.0 \times 10^9/L$ 4-11

Platelets $202 \times 10^9/L$ 150-400

Serum Sodium 138 mmol/l 135-146

Serum Potassium 4.8 mmol/l 3.5-5

Creatinine 190 $\mu\text{mol/l}$ 79-118

Which of the following is likely to represent the most appropriate dosing regime for the gentamicin?

1- 0.75 mg/kg OD

2- 1 mg/kg BD

3- 1 mg/kg OD

4- 1 mg/kg TDS

5- 1.5 mg/kg OD

Answer & Comments

Answer: 3- 1 mg/kg OD

Where gentamicin is concerned both ototoxicity and nephrotoxicity are potential concerns.

In patients with low creatinine clearance the data sheet recommends a dosing regimen of 80 mg once per day. Given this woman's creatinine is 190 it seems likely she will fall into this group, (10-30 ml/min GFR), although this should be formally calculated either using the Cockcroft-Gault or MDRD equations available on the internet.

Where weight is less than 60 kg it is better to reduce the dose to 60 mg daily.

Studies have compared potential risk of ototoxicity versus efficacy for the OD and BD dosing regimens. It has become apparent that

once daily dosing is associated with reduced risk of toxicity.

Peak levels of gentamicin should however still be assayed, aiming for a level one hour after dosing of between 4 and 10 mg/l. With respect to pre-dose levels the gentamicin SPC recommends not exceeding 2 mg/l.

Three other drugs which require therapeutic monitoring are phenytoin, warfarin and clozapine.

Phenytoin is a highly effective anti-epileptic but is associated at toxic levels with neurological dysfunction including dizziness and nystagmus.

Most warfarin therapy is directed towards a narrow therapeutic window between an INR of 2-3. Ineffective anticoagulation and excess coagulation can both be associated with significant adverse effects.

Clozapine is effective in the treatment of psychotic disorders but is associated with blood cell dyscrasias, for this reason regular monitoring of full blood count is recommended.

Whereas monitoring of gentamicin and phenytoin involves PK monitoring (measuring the level of the drug in plasma), monitoring of warfarin and clozapine is essentially pharmacodynamic monitoring, looking for either over anticoagulation or abnormalities in the white blood cell count.



[Q: 2876] OnExamination 2012 - Clinical pharmacology

You are asked to see a 27-year-old woman on the oncology ward. She has been admitted for a course of chemotherapy and has been taking high dose steroids for a few days. The nurses report that she is very agitated and talks about trying to open the window of her room and jump out from the fourth floor.

You review her notes and see that she admits to drinking a few glasses of wine per week and has smoked cannabis on a few occasions.

On examination her BP is 145/88 mmHg, her pulse is 80 and regular and she looks agitated and upset.

Investigations show:

Haemoglobin 12.1 g/dl(11.5-16.5)

White cell count $16.2 \times 10^9/L$ (4-11)

Platelets $200 \times 10^9/L$ (150-400)

C-reactive protein 9 nmol/l (<10)

Sodium 140 mmol/l (135-146)

Potassium 3.9 mmol/l (3.5-5)

Creatinine 92 $\mu\text{mol/l}$ (79-118)

Which of the following is the most likely diagnosis?

- 1- Alcohol withdrawal
- 2- Cannabis-related psychosis
- 3- Corticosteroid-related psychosis
- 4- Manic depressive psychosis
- 5- Personality disorder

Answer & Comments

Answer: 3- Corticosteroid-related psychosis

Corticosteroid-related psychosis is seen within a few days of starting high dose oral or intravenous corticosteroids, although some patients have been diagnosed with the condition up to 12 weeks or more after commencing therapy.

Symptoms which are seen include

Agitation

Hypomania

Suicidal intent.

Given the close proximity of her symptoms to the onset of steroid therapy this is much more likely to be the diagnosis than cannabis or alcohol related psychiatric disorder.

In severe cases, typical or atypical antipsychotics or benzodiazepines to manage agitation may be required.



[Q: 2877] OnExamination 2012 - Clinical pharmacology

A 44-year-old woman is taking lithium for bipolar disorder. She also suffers from hypertension and angina and recently underwent a medication review at her GP. She also suffers from osteoarthritis of her knees and has suffered a recent respiratory tract infection.

Over the past few days she has become increasingly drowsy, with ataxia, dizziness and slurred speech. A lithium level is measured at 4 mmol/l.

Which of the following is most likely to have resulted in her presentation with lithium toxicity?

- 1- Amoxicillin
- 2- Atenolol
- 3- Paracetamol
- 4- Ramipril
- 5- Verapamil

Answer & Comments

Answer: 4- Ramipril

ACE inhibitors are known to increase serum lithium levels, as are dihydropyridine calcium antagonists.

Atenolol, in contrast, is a relatively safer option for the treatment of hypertension in association with long term lithium use.

Verapamil in combination with lithium leads to neurotoxicity; this is independent of any increase in serum lithium levels.

If patients have poorly controlled hypertension and they are taking lithium, it may be better to discuss the case with the psychiatrist to see if they can be changed to

another mood stabilising agent, such as sodium valproate.



[Q: 2878] OnExamination 2012 -
Clinical pharmacology

A 55-year-old woman is attending clinic a number of months after having had a myocardial infarction.

She has been commenced on appropriate drugs to reduce cardiovascular risk and has made dietary modifications for healthy living. Recently, however, she complains of muscle aches and pains and is found to have an elevated CPK.

Consumption of which of the following is likely to have contributed to increased statin-associated myotoxicity?

- 1- Carrot juice
- 2- Cranberry juice
- 3- Garlic cloves
- 4- Grapefruit juice
- 5- Omega-3 fish oils

Answer & Comments

Answer: 4- Grapefruit juice

Grapefruit juice significantly increases serum concentrations of some statins. This is achieved by reducing the CYP3A4-mediated first-pass metabolism in the small intestine. Concomitant use of atorvastatin and large amounts of grapefruit juice should be avoided, or the dose of atorvastatin should be reduced accordingly. CYP3A4 is a member of the cytochrome P450 system.

Whilst a interaction is increasingly being recognised between cranberry juice and warfarin, there has as yet been no interaction with other drugs metabolised via the P450 system.

No interaction has been shown between statins, carrot juice, garlic or omega-3 fish oils.



[Q: 2879] OnExamination 2012 -
Clinical pharmacology

A 45-year-old female attends the clinic complaining of headache and vomiting for five days. She has a history of scleroderma complicated by stage V chronic kidney disease.

On examination, she is tachycardic and has a blood pressure of 240/130 mmHg. Fundoscopy reveals grade 3 hypertensive retinopathy.

Which of the following is a centrally acting antihypertensive agent?

- 1- Diazoxide
- 2- Hydralazine
- 3- Minoxidil
- 4- Moxonidine
- 5- Sodium nitroprusside

Answer & Comments

Answer: 4- Moxonidine

Moxonidine is centrally acting and is licensed for mild to moderate hypertension not controlled by β -blockers, ACE inhibitors, calcium channel antagonists and thiazides. Moxonidine is a selective agonist at the imidazoline subtype 1 receptor. This receptor subtype is found in the medulla oblongata. Moxonidine causes a decrease in sympathetic nervous system activity and therefore a decrease in blood pressure.

The other drugs listed are vasodilator in action.

Diazoxide and sodium nitroprusside can be used intravenously in hypertensive emergencies.

Minoxidil is reserved for when hypertension is resistant to other treatments; it causes fluid retention and oedema, however it is effective in combination with a β -blocker and loop diuretic.

Hydralazine can be given orally also in combination with a diuretic and β -blocker. Side effects include reflex tachycardia and fluid retention.



[Q: 2880] OnExamination 2012 - Clinical pharmacology

Which of the following drugs interacts with cranberry juice?

- 1- Amiodarone
- 2- Digoxin
- 3- Propranolol
- 4- Simvastatin
- 5- Warfarin

Answer & Comments

Answer: 5- Warfarin

This theme has apparently been asked in the examination.

I suspect that the authors of this paper were responsible for composing this question.

The answer is warfarin.



[Q: 2881] OnExamination 2012 - Clinical pharmacology

A 35-year-old man is admitted following a serious attempt at paracetamol overdose. Despite efforts to treat him he develops liver failure.

Which of the following is most likely with the ensuing liver failure?

- 1- Better prognosis in older patients
- 2- Better prognosis in those with high alcohol consumption
- 3- Hypoglycaemia rarely happens within 12 hours of onset of encephalopathy
- 4- It is harmful to give N-acetylcysteine
- 5- Lactic acidosis is recognised complication

Answer & Comments

Answer: 5- Lactic acidosis is recognised complication

Use of intravenous N-acetylcysteine reduces morbidity and mortality in fulminant hepatic failure.

Severe hypoglycaemia affects 40% of patients with fulminant liver failure, which exacerbates encephalopathy. It may develop rapidly and recur with sepsis.

Lactic acidosis is due to decreased hepatic lactate clearance, compounded by poor peripheral perfusion and increased lactate production.

There is a poor prognosis in those with blood PH<7.0, prolonged prothrombin time (>100s) and serum creatinine >300uM.

Mortality is greater if the patient is more than 40 years of age.



[Q: 2882] OnExamination 2012 - Clinical pharmacology

A 60-year-old man who has been prescribed lisinopril for hypertension presents with an irritating cough.

What is the mechanism responsible for ACE-induced cough?

- 1- Angiotensin I accumulation
- 2- Asthma
- 3- Bradykinin accumulation
- 4- Laryngeal irritation
- 5- Renin accumulation

Answer & Comments

Answer: 3- Bradykinin accumulation

The enzyme ACE is also responsible for the metabolism of bradykinin in mast cells.

The accumulation of this substance is responsible for the cough found in up to 30% of subjects taking ACE-inhibitors.

This phenomenon is not seen in subjects taking angiotensin receptor blockers such as losartan.



[Q: 2883] OnExamination 2012 - Clinical pharmacology

Miss L is a 25-year-old woman attending the general medical clinic.

For the last six months she has felt generally fatigued and has noticed abdominal bloating and occasional diarrhoea. She has multiple symptoms that have been troubling her for the last few years and her GP would like some advice on diagnosis and management.

She has also been troubled by large, painful mouth ulcers that can be so severe that she is unable to eat. She says that she has had mouth ulcers since she was a teenager and gets them at least once per week.

She complains of joint pains affecting her hands and knees, and reports one brief episode of swelling of the right knee that resolved after a week or so of painkillers.

Last year, she was seen urgently by the ophthalmologists when she developed an acutely red and painful left eye associated with blurred vision and photophobia. She cannot remember what the diagnosis was, but was treated with steroid drops and this has not bothered her since.

On further questioning, you find out that she has also been seen in the GUM clinic complaining of painful vulval ulceration. Swabs and blood samples were taken, but no diagnosis was reached. The symptoms have recurred twice since the first episode two years ago.

You read the referral letter from her GP who describes an episode of erythema nodosum last year. He also mentions that she was

treated for a DVT following a trip to Cyprus when she was 17.

What is the likely unifying diagnosis?

- 1- Crohn's disease
- 2- Brucellosis
- 3- Fibromyalgia
- 4- Behcet's disease
- 5- Systemic lupus erythematosus

Answer & Comments

Answer: 4- Behcet's disease

The combination of venous ulceration, iritis, mouth ulceration and arthritis is typical of Behcet's disease.

Behçet's syndrome is a systemic vasculitis with an unknown aetiology, which affects small and large vessels (venous and arterial). More than 60% of patients are HLA-B51, and there is an increased prevalence in the Mediterranean countries. It is commonly associated with mucocutaneous manifestations (oro-genital ulceration, erythema nodosum), ocular disease, gastrointestinal involvement and neurological features. Venous thrombosis is a common complication, but arterial occlusion can also occur.

The International Study Group criteria for classification of Behcet's disease requires the presence of recurrent oral ulceration (minor aphthous, major aphthous or herpetiform ulceration observed by physician or patient, which have recurred at least three times in a 12 month period), and two of the following:

- Recurrent genital ulceration: aphthous ulceration or scarring, observed by physician or patient
- Eye lesions: anterior uveitis, posterior uveitis, or cells in vitreous on slit lamp examination; or retinal vasculitis observed by ophthalmologist

- Skin lesions: erythema nodosum observed by physician or patient, pseudofolliculitis or papulopustular lesions; or acneiform nodules observed by the physician in post-adolescent patients not on corticosteroid treatment
- Positive pathergy test: read by physician at 24-48 hours.

Pathergy is the non-specific hyper-reactivity of the skin following minor trauma, and is specific to Behcet's disease. It involves intradermal injection of skin with a 20-gauge needle under sterile conditions. It is considered positive if an erythematous sterile papule develops within 48 hours.

- A. This presentation is not typical of Crohn's disease - one would expect a history of diarrhoea, abdominal pain and/or PR bleeding.
- B. Brucellosis is an infective condition which presents most commonly with fever and malaise. It does not fit with the above scenario.
- C. Fibromyalgia presents with pain and tenderness in a number of muscles. Extra-articular features such as genital ulceration are not seen.
- D. Behcet's disease is the most appropriate diagnosis.
- E. Whilst a number of the features described in this scenario could fit with SLE and/or antiphospholipid syndrome the history of oral and genital ulceration is much more typical of Behcet's disease.



[Q: 2884] OnExamination 2012 - Clinical pharmacology

An 18-year-old woman is brought to the Emergency department with shortness of breath, stridor, and an urticarial rash.

On examination her BP is 90/50 mmHg and she has a tachycardia of 95 beats per minute. You give her hydrocortisone and an IV fluid

challenge but her BP fails to improve. You decide to administer adrenalin.

Which of the following is the most appropriate method of administration and dosage?

- 1- 0.5 ml of 1:1000 adrenalin IM
- 2- 0.5 ml of 1:10000 adrenalin IV
- 3- 1 mcg/min IV adrenalin infusion
- 4- 1 ml of 1:10000 adrenalin IM
- 5- 4 mcg/min IV adrenalin infusion

Answer & Comments

Answer: 1- 0.5 ml of 1:1000 adrenalin IM

Multimodal therapy involving use of an IV corticosteroid, IV antihistamine and fluid loading is usually employed in the treatment of anaphylaxis.

IV corticosteroids are designed to modulate downstream release of cytokines from inflammatory cells, they reduce the duration and severity of anaphylaxis.

IV antihistamine is designed to block the effects of histamine on the vascular tree, which ameliorates hypotension, and on the airways, reducing shortness of breath and stridor. Fluid loading is designed to raise blood pressure.

Adrenalin is used for its alpha-agonist effects that include increased peripheral vascular resistance and reversed peripheral vasodilatation, systemic hypotension, and vascular permeability.

Beta-agonist effects include bronchodilatation, chronotropic cardiac activity, and positive inotropic effects.

IM administration is preferred because of a superior safety profile with respect to cardiac adverse events compared with the IV route, although 1:10000 adrenalin IV may be used in a life-threatening situation.

Reference:

<http://www.resus.org.uk/pages/reaction.pdf>



[Q: 2885] OnExamination 2012 -
Clinical pharmacology

You have a 23-year-old female patient who suffers from complex partial epilepsy.

When she comes to her clinic appointment she tells you she is worried because her fit frequency has increased and wants more medication. On examination you also notice that she has a significant fungal infection. Medication includes the oral contraceptive pill.

Which of the following agents is likely significantly to increase her risk of getting pregnant?

- 1- Fluconazole
- 2- Ketoconazole
- 3- Lamotrigine
- 4- Levetiracetam
- 5- Phenytoin

Answer & Comments

Answer: 5- Phenytoin

Phenytoin is a potent enzyme inducer of the cytochrome P450 system; as such it reduces plasma levels of agents which undergo hepatic metabolism, including sex steroids given in the oral contraceptive pill.

Fluconazole and ketoconazole are all inhibitors of the CYP450 system and would lead to increased levels of other agents.

Lamotrigine is metabolised principally by UDP-glucuronyl transferases, as such there is not significant interaction with the OCP.

Levetiracetam does not alter the pharmacokinetics of the oral contraceptive.



[Q: 2886] OnExamination 2012 -
Clinical pharmacology

A 52-year-old accountant presents with a five hour history of confusion and agitation.

He is known to have an alcohol problem but has avoided all alcohol for the last three days.

On examination, he is sweating, is agitated and disorientated.

His temperature is 37.5°C, pulse 110 bpm regular and blood pressure is 152/74 mmHg. He claims to see things on the walls.

His investigations reveal:

FBC Normal

U&Es Normal

Plasma glucose 4.6 mmol/l (3.6-6)

Which of the following agents would be the most appropriate treatment for this man?

- 1- IV haloperidol
- 2- Oral lorazepam
- 3- IV phenobarbital
- 4- IV phenytoin
- 5- Oral diazepam

Answer & Comments

Answer: 2- Oral lorazepam

This is a typical history of delirium tremens (DTs).

In the UK it is estimated 24% of adults drink in a hazardous way, which is highest in the North East, North West and Yorkshire and Humber. Approximately 20% of patients admitted to hospital for illnesses unrelated to alcohol are drinking at potentially hazardous levels, and its therefore important to ask all patients about their alcohol use. An abrupt reduction in alcohol intake in a person who has been drinking excessively for a prolonged period of time, for example as occurs on admission to hospital, may result in the development of alcohol withdrawal.

Symptoms typically present about 8 hours after a significant fall in blood alcohol levels. The peak is on day two, and by day five the symptoms are significantly better. Minor withdrawal symptoms appear 6-12 hours after

cessation of alcohol and include: insomnia, fatigue, tremor, anxiety, nausea, vomiting, headache, sweating, palpitations, anorexia, depression and craving. Alcoholic hallucinosis can appear 12-24 hours after stopping alcohol and includes visual, auditory and tactile hallucinations. Withdrawal seizures can appear 24-28 hours after cessation and are generalised tonic-clonic seizures. Alcohol withdrawal delirium ('delirium tremens') can appear 48-72 hours after cessation.

This patient has delirium tremens, which should be treated as a medical emergency. The signs of altered mental status alert you to the fact that this is different from simple alcohol withdrawal. These signs can include hallucinations (auditory, visual, olfactory), confusion, delusions and severe agitation. Seizures can also occur. Delirium tremens is a hyperadrenergic state, and is often associated with tachycardia, hyperthermia, hypertension, tachypnoea, tremor and mydriasis. Patients at increased risk are those with a previous history of delirium tremens or alcohol withdrawal seizures, those with a co-existing infection or abnormal liver function, and older patients. It is a clinical diagnosis.

Delirium tremens should be treated with oral lorazepam as first-line treatment. If the symptoms persist, or the medication is refused, parenteral lorazepam, haloperidol or olanzapine should be given. Intensive care may be required.

If delirium tremens develops during treatment for acute withdrawal, the reducing regime should be reviewed.

The mortality rate can be up to 35% if untreated, which reduces to 5% with early recognition and treatment.

In patients with alcohol withdrawal seizures, a quick-acting benzodiazepine should be given (such as lorazepam). Phenytoin should not be given.

Patients who are at high-risk of alcohol withdrawal but have no or only mild symptoms are typically given a reducing dose of chlordiazepoxide (a long-acting benzodiazepine) over 5-7 days. Diazepam is an alternative. Chlormethiazole may also be offered as an alternative, but is rarely used as if used with alcohol there is a risk of fatal respiratory depression, especially in patients with liver cirrhosis.

In addition, you should not forget the importance of giving high-potency B vitamins, specifically thiamine (e.g. pabrinex) to all patients with a history of high alcohol intake to reduce the risk of Wernicke's encephalopathy.



[Q: 2887] OnExamination 2012 - Clinical pharmacology

You look up a drug in the BNF and note the following against it:

?????? missed sympol ??????

What does this signify?

- 1- Drug is not available on the NHS
- 2- Over the counter therapy
- 3- Prescription only drug
- 4- Report any potential adverse event
- 5- Report only potentially serious adverse events

Answer & Comments

Answer: 4- Report any potential adverse event

The Committee on the Safety of Medicines assigns the inverted black triangle to those relatively new drugs/vaccines or blood products to notify prescribers that the drug is under surveillance and that all suspected adverse reactions associated with the drug should be reported, typically with a yellow card.



[Q: 2888] OnExamination 2012 -
Clinical pharmacology

A 55-year-old man on treatment for hypertension, epilepsy and gastro-oesophageal reflux disease presented with an urticarial skin eruption. A drug reaction is suspected since he has recently started a new drug.

Which of the following medications is most likely to be responsible?

- 1- Aspirin
- 2- Atorvastatin
- 3- Omeprazole
- 4- Paracetamol
- 5- Sodium valproate

Answer & Comments

Answer: 1- Aspirin

Urticaria is one of the most common dermatologic problems seen by primary care physicians and often a source of frustration for patient and physician alike. Pinpointing the cause may be challenging--or impossible--because of the many and varied triggers.

Patients with aspirin sensitivity can present with either mucosal reactions (the aspirin triad of nasal polyposis, sinusitis, and asthma) or cutaneous reactions (urticaria or anaphylaxis).

More reading



[Q: 2889] OnExamination 2012 -
Clinical pharmacology

A 55-year-old male who is being treated with lithium for a bipolar disorder has a long history of hypertension for which he is receiving escalating doses of medication. On his most recent visit to clinic his blood pressure was noted to be 166/102 mmHg and a new antihypertensive was added to his current antihypertensive therapy.

Five days later he presents with features of lithium toxicity including tremor, nausea and weakness.

The addition of which of the following drugs was likely to have precipitated the lithium toxicity?

- 1- Doxazosin
- 2- Hydralazine
- 3- Irbesartan
- 4- Minoxidil
- 5- Moxonidine

Answer & Comments

Answer: 3- Irbesartan

The precipitation of lithium toxicity by diuretics is well appreciated. Yet ACE inhibitors [log-in required to read full text] and angiotensin antagonists are also capable of precipitating lithium toxicity through reduced lithium clearance.

Other drugs that may precipitate lithium toxicity include:

NSAIDs

Tetracycline

Phenytoin

Ciclosporin.



[Q: 2890] OnExamination 2012 -
Clinical pharmacology

A new drug is being studied to find the most appropriate dose in a dose response study.

Small doses of the drug lead to a linear increase in serum drug concentration.

At higher doses there is an exponential rise in serum drug concentration.

Which of the following best describes the pharmacokinetic properties of this new drug?

- 1- First order kinetics
- 2- First pass effect

- 3- Long plasma half life
- 4- Saturation kinetics
- 5- Zero order kinetics

Pupils tend to be dilated with TCA overdose. Paracetamol, cyanide, and paraquat should not affect pupils.

Answer & Comments

Answer: 4- Saturation kinetics

The description of the kinetics of this new drug show that with small doses there is a linear response (first order kinetics) to dosing but this becomes saturated and the serum concentration of the drug rises sharply (zero order kinetics).

This response is typical of drugs such as phenytoin (saturates liver metabolism).



[Q: 2891] OnExamination 2012 - Clinical pharmacology

A farmer on treatment for depression is admitted acutely one hour following an intentional overdose of an unidentified substance.

On examination he is bradycardic, hypotensive, disorientated, hypersalivating, and has small pupils.

Which of the following is he most likely to have ingested?

- 1- A tricyclic antidepressant (TCA)
- 2- An organophosphate insecticide
- 3- Cyanide
- 4- Paracetamol
- 5- Paraquat

Answer & Comments

Answer: 2- An organophosphate insecticide

Hypersalivation and miosis are the specific clues to acetylcholine overactivity.

The patient has occupational access to organophosphate insecticides.



[Q: 2892] OnExamination 2012 - Respiratory

A 21-year-old female presents with joint pains and rash. On examination her blood pressure was 140/100 mmHg.

Investigations reveal:

Creatinine 90 μ mol/l (60-110)

Anti dsDNA antibodies Strongly positive(0-73)

24 hour urinary protein excretion 1.7 g(<0.2)

Renal biopsy Membranous nephropathy

What is the most appropriate next treatment for her nephropathy?

- 1- ACE inhibitor for blood pressure control
- 2- Cyclophosphamide
- 3- NSAIDs for arthralgia
- 4- Prednisolone for immunosuppression
- 5- Warfarin anticoagulation

Answer & Comments

Answer: 1- ACE inhibitor for blood pressure control

This patient has systemic lupus erythematosus with the disease affecting her kidneys.

The renal manifestations of SLE are highly variable, ranging from mild asymptomatic proteinuria and/or haematuria to rapidly progressive uraemia. The various presentations are difficult to classify into clinical syndromes and histological classes. Although lupus nephritis affects a third of patients early in the disease it is frequently unrecognised until nephritic and/or nephrotic syndrome with renal failure occur.

Histologically, a number of different types of renal disease are recognised in SLE, with immune-complex mediated glomerular disease being the most common. The up to date International Society of Nephrology/Renal Pathology Society 2003 classification divides these into six different patterns:

- I - minimal mesangial
- II - mesangial proliferative
- III - focal
- IV - diffuse
- V - membranous
- VI - advanced sclerosis

Patients with membranous lupus nephritis tend to present with nephrotic syndrome. Microscopic haematuria and hypertension may also be seen. Biopsies show global or segmental subepithelial immune deposits or their morphologic sequelae, with or without mesangial alterations. It may occur in combination with class III or IV, in which case both are diagnosed. Progression is variable, and immunosuppression is not always needed. Cyclophosphamide, mycophenolate mofetil and azathioprine reduce mortality in proliferative forms of lupus glomerulonephritis, but the benefit is not clear in membranous forms.

More important to this patient's renal disease in this patient is aggressive blood pressure control. An angiotensin-converting enzyme (ACE) inhibitor would be first line, as it has been shown to reduce proteinuria independently of its effect on blood pressure.

Warfarin is not considered an appropriate treatment as this lady has not exhibited any prothrombotic tendencies.

Non-steroidal anti-inflammatory medication would treat her arthralgia but would have no effect on the prognosis of the disease.

Therefore the correct answer should be A, but immunosuppression may well be required to manage her extra-renal disease.



[Q: 2893] OnExamination 2012 - Respiratory

A 41-year-old woman comes to the clinic with increasing shortness of breath. She has a

history of systemic sclerosis, takes omeprazole for reflux symptoms and nifedipine slow release for Raynaud's disease.

On examination her BP is 155/85 mmHg, pulse is 82 and regular. There is peripheral calcinosis on examination of the hands and pinching of the corners of the mouth consistent with scleroderma. Auscultation of the chest reveals scattered inspiratory crackles across both lung fields.

Investigations show:

Haemoglobin 12.2 g/dl(11.5-16.0)

White cell count $8.3 \times 10^9/L$ (4-11)

Platelets $199 \times 10^9/L$ (150-400)

ESR 62 mm/hr(<10)

Sodium 138 mmol/l (135-146)

Potassium 4.3 mmol/l (3.5-5)

Creatinine 131 micromol/l (79-118)

CXR - Bilateral interstitial infiltrates.

Echocardiogram - Ejection fraction 53%.

Which of the following is the most likely diagnosis?

- 1- Bacterial pneumonia
- 2- Cryptogenic fibrosing alveolitis
- 3- Eosinophilic pneumonitis
- 4- Interstitial fibrosis
- 5- Pulmonary oedema

Answer & Comments

Answer: 4- Interstitial fibrosis

Systemic sclerosis is a chronic autoimmune disease characterised by increased fibroblast activity and fibrosis in a number of different organ systems. 90-95% of patients have positive antinuclear antibodies. There are two major subtypes: limited cutaneous and diffuse cutaneous. CREST syndrome is an older term for the limited cutaneous form (calcinosis, Raynauds' phenomenon, oesophageal dysmotility, sclerodactyly, telangiectasia).

Patients with systemic sclerosis can present with skin abnormalities, musculoskeletal changes, gastrointestinal complications, pulmonary disease, renal crisis and dry eyes and mouth.

A number of autoantibodies against extractable nuclear antigens can be detected in patients with systemic sclerosis. Anti-centromere antibodies and anti-topoisomerase I antibodies are the classic autoantibodies associated with the disease. Anti-centromere antibodies are linked with limited cutaneous involvement and isolated pulmonary hypertension, and a good prognosis, whereas anti-topoisomerase I and linked with diffuse skin disease and pulmonary fibrosis and a higher mortality.

Respiratory symptoms are common in patients with systemic sclerosis, but it is often difficult to distinguish between interstitial lung disease and pulmonary hypertension as the cause. Echocardiography, pulmonary hypertension and chest radiographs or CT are often required.

Inspiratory crackles heard here, coupled with bilateral interstitial infiltrates on chest radiograph, make interstitial lung disease the most likely diagnosis, but it is important to note they are not always present in the early stages of disease. The condition may be steroid responsive; as such a trial of prednisolone plus or minus an appropriate second line agent is indicated. Signs of pulmonary hypertension are jugular venous distension, right ventricular heave and an accentuated pulmonary second heart sound.

Given the chronic nature of her disease bacterial infection is unlikely.

Cryptogenic fibrosing alveolitis is by definition of unknown aetiology and this too therefore cannot be the correct answer.

Given the normal ejection fraction pulmonary oedema is also unlikely.

The absence of leukocytosis, and normal eosinophil count makes eosinophilic pneumonitis unlikely.



[Q: 2894] OnExamination 2012 - Respiratory

A 24-year-old man presents to the Emergency department and complains of shortness of breath.

Before his chest x ray is taken he tells the casualty officer that he is known to have an 'azygous lobe'.

In what region of the chest x ray would you expect to see an 'azygous lobe'?

- 1- Left lower zone
- 2- Left mid zone
- 3- Left upper zone
- 4- Right lower zone
- 5- Right upper zone

Answer & Comments

Answer: 5- Right upper zone

An azygous lobe is seen in about 0.5% of routine chest x rays and is a normal variant.

It is seen as a 'reverse comma sign' behind the medial end of the right clavicle on the upper zone of the right lung. It appears separated from the rest of the upper lobe by a deep groove (which contains the azygous vein). It has little clinical significance. It develops in utero when the apical bronchus grows medial to the arch of the azygous vein instead of lateral.



[Q: 2895] OnExamination 2012 - Respiratory

A 23-year-old man presents to the Emergency department with sudden onset left sided pleuritic chest pain. He has had a chronic cough over the past few days and says the pain came on after a coughing fit.

On examination his BP is 148/82 mmHg, pulse is 82 and regular, his saturations are 95% on air. Chest sounds appear normal.

Investigations show:

pH 7.42(7.35-7.45)

pCO₂ 4.8 kPa(4.8-6.1)

pO₂ 10.2 kPa(10-13.3)

CXR Small left sided pneumothorax (<5%)

Which of the following is the most appropriate way to manage him?

- 1- Admit for overnight oxygen therapy
- 2- Chest drain
- 3- Discharge and review in 24 hours
- 4- Discharge and review in the clinic in two to three weeks
- 5- Pleural aspiration

Answer & Comments

Answer: 4- Discharge and review in the clinic in two to three weeks

This gentleman has a spontaneous pneumothorax. It is primary (defined as age less than 50y, no significant smoking history, and no evidence of underlying lung disease). Management depends on the size, and the patient's symptoms. If it is small, as in this case, the patient can be discharged and reviewed in an outpatient clinic in 2-4 weeks. If the rim of air measures more than 2cm at the level of the hilum, and/or the patient is breathless the pneumothorax can be aspirated.

A chest drain is indicated if aspiration fails in a large or symptomatic primary pneumothorax. They can also be used in the management of secondary pneumothorax.

Supplemental oxygen accelerates reabsorption of air by a factor of four, but overnight treatment does not feature as part of the current UK guidelines in small primary pneumothoraces.



[Q: 2896] OnExamination 2012 - Respiratory

A 45-year-old man has been diagnosed with pulmonary tuberculosis.

Which of the following investigations is essential prior to starting antituberculous therapy?

- 1- Full blood count
- 2- Liver function test
- 3- Plasma glucose
- 4- Urine for acid-fast bacilli
- 5- Vitamin B6

Answer & Comments

Answer: 2- Liver function test

Hepatotoxicity is a feature of antituberculous treatment.

"Liver function should be checked before treatment for clinical cases."



[Q: 2897] OnExamination 2012 - Respiratory

You are asked to see a patient who attends the emergency department with shortness of breath.

The chest x ray shows right lower lobe consolidation.

Which of the following features should prompt admission to hospital?

- 1- Audible bronchial breathing
- 2- A paO_2 of 9.8 kPa (11-13)
- 3- A respiratory rate of 32/min
- 4- A SaO_2 of 95%
- 5- A white cell count of $16.8 \times 10^9/\text{L}$ (4-10)

Answer & Comments

Answer: 3- A respiratory rate of 32/min

The British Thoracic Society guidelines for community acquired pneumonia in adults recommend use of the CURB-65.

This is a 6-point score, one point for each of

Confusion

Urea more than 7 mmol/l

Respiratory rate 30/min or more

Systolic Blood pressure below 90 mmHg (or diastolic below 60 mmHg)

Age 65 years or older.

If the CURB score is 1-2 then risk of death is increased and hospital admission should be considered.

A CURB score of 3 or more puts the patient at high risk of death and hospital admission is warranted.



[Q: 2898] OnExamination 2012 - Respiratory

A 65-year-old man with known chronic obstructive pulmonary disease (COPD), treated with inhalers, was admitted with a six week history of gradually increasing shortness of breath.

He was afebrile, mildly confused with a respiratory rate of 26 breaths per minute and there were no changes on the chest x ray.

Investigations revealed:

paO_2 7.8kPa (9-12.6)

paCO_2 8.5kPa (4.7-6.0)

pH 7.3 (7.36-7.44)

What is the most appropriate immediate management?

- 1- High flow oxygen therapy
- 2- Intravenous aminophylline
- 3- Intravenous hydrocortisone
- 4- Intubation and mechanical ventilation.

- 5- Nebulised salbutamol and ipratropium bromide.

Answer & Comments

Answer: 5- Nebulised salbutamol and ipratropium bromide.

This patient has an exacerbation of COPD, defined as sustained worsening of the patient's symptoms which is acute in onset. This may include worsening breathlessness, cough, increased sputum and change in sputum colour. The diagnosis is usually made clinically. Supporting investigations include a chest radiograph, arterial blood gases, ECG, routine bloods and sputum and blood cultures.

Treatment is with bronchodilators, nebulised in the majority of patients. If a patient is hypercapnic or acidotic, as in this case, these should be driven by compressed air. If oxygen therapy is needed it should be administered simultaneously by nasal cannulae.

Oxygen should be given to maintain SaO₂ within the patient's individual target range, if available (COPD patients are being given cards with this information, so always ask). ABGs should be repeated at regular intervals to monitor response to treatment, and oxygen weaned when available. High-flow oxygen can potentially worsen hypercapnia and should be avoided.

Oral corticosteroids should also be given: 30mg prednisolone for 7-14 days. Prolonged courses offer no additional benefit. Intravenous can be used if the patient is unable to tolerate oral tablets. The effect is delayed, and nebuliser therapy should be initiated first.

Antibiotics should be used to treat exacerbations associated with more purulent sputum, consolidation on chest radiograph, or clinical signs of pneumonia. Empirical antibiotic choice should be guided by local

policy, and altered to take account of any subsequent culture results.

Non-invasive ventilation (NIV) is the treatment of choice for persistent hypercapnic ventilation failure despite optimal medical therapy. It has been shown in RCTs to reduce intubation rate and mortality in COPD patients with decompensated respiratory acidosis (pH <7.35 and pCO₂ >6kPa). NIV should therefore be considered within the first 60 minutes of hospital arrival in all patients with an acute exacerbation of COPD in whom a respiratory acidosis persists despite maximal medical therapy (controlled oxygen, nebulised salbutamol and ipratropium, prednisolone, antibiotic (where indicated)). Exceptions may be: life threatening hypoxaemia (when invasive ventilation may be more appropriate), severe co-morbidity, severe cognitive impairment (where NIV is not tolerated), facial burns/trauma/surgery, vomiting, fixed upper airway obstruction, undrained pneumothorax, upper GI surgery, unprotected airway, copious respiratory secretions, haemodynamic instability requiring inotropes.

Patients should be sitting or semi-recumbant, and a full-face mask used initially. An initial inspiratory positive airway pressure (IPAP) of 10cm H₂O and expiratory positive airway pressure (EPAP) of 4-5cm H₂O should be used. IPAP should be increased by 2-5cm increments every 10 minutes, with a usual target of 20cm H₂O or until a therapeutic response is achieved. Oxygen can be introduced into the circuit, usually with a target saturation of 88-92%. Bronchodilators are preferably administered off NIV. Patients should be closely monitored, including ABG, respiratory rate and heart rate. ABGs should be repeated after 1 hour of NIV therapy, and 1 hour after subsequent change in settings or 4 hours in stable patients.

All non-invasive ventilation services should have their own local protocol based on these

guidelines. There should be a clear plan of what to do in the event of deterioration.

Patients with a pH <7.26 should be managed with a low threshold for intubation, and this should be considered in this case. Functional status, BMI, requirement for oxygen when stable, comorbidities and previous admissions should be considered in addition to age and FEV₁ when assessing suitability. Whilst in clinical practice you would give NIV whilst awaiting consideration from intensive care, it is important to consider intubation in this patient who is failing to improve.

Intravenous aminophylline should be used only if there is an inadequate response to nebulised bronchodilators. Levels should be closely monitored.



[Q: 2899] OnExamination 2012 - Respiratory

Which of the following statements regarding the sweat test is true?

- 1- At least 25 mg of sweat is necessary for a reliable result.
- 2- False/positive results may be encountered in children with nephrotic syndrome.
- 3- More than 60 mmol/L of chloride in sweat is diagnostic of cystic fibrosis.
- 4- Sweating is enhanced by application of atropine.
- 5- The filter paper is left on for a total of about four hours.

Answer & Comments

Answer: 3- More than 60 mmol/L of chloride in sweat is diagnostic of cystic fibrosis.

The sweat test is conducted using pilocarpine iontophoresis.

A 3mA current carries pilocarpine into the skin of the forearm stimulating local sweating. The arm is washed with distilled water and sweat

collected on a filter paper or gauze. The duration of collection is usually 30-60 minutes.

The filter paper is removed, weighed and eluted in distilled water. At least 50 mg and preferably 100 mg of sweat should be collected for reliable results. It may not be possible to collect this amount in young infants.

More than 60mmol/L of chloride is diagnostic of cystic fibrosis (CF) when one or more other criteria are present. In healthy adults, the sweat chloride values increase slightly, but 60 mmol/L still differentiates CF from other conditions.

False/negative results may be encountered in nephrotic syndromes.



[Q: 2900] OnExamination 2012 - Respiratory

A 27-year-old woman is referred to the respiratory clinic with increasing shortness of breath and episodes of syncope. On further questioning it transpires that her mother suffered from a lung / circulatory condition and died a few years after a heart lung transplant, and her aunt died at a young age, from a condition which they were told was heart failure.

Her BP is 145/82 mmHg, her pulse is 85 and regular, and her BMI is 22. There is a murmur of tricuspid regurgitation, and bilateral pitting oedema of the ankles.

Investigations show:

Haemoglobin 12.6 g/dl(11.5-16.0)

White cell count $6.8 \times 10^9/L$ (4-11)

Platelets $205 \times 10^9/L$ (150-400)

Sodium 136 mmol/l (135-146)

Potassium 3.9 mmol/l (3.5-5)

Creatinine 119 $\mu\text{mol/l}$ (79-118)

Echocardiogram Evidence of increased right sided pressures

Which of the following is the most likely mode of inheritance?

- 1- Autosomal dominant
- 2- Autosomal recessive
- 3- De-novo mutation
- 4- X linked dominant
- 5- X linked recessive

Answer & Comments

Answer: 1- Autosomal dominant

This woman has familial primary pulmonary hypertension (PPH). This is evidenced by her age, and particularly symptoms such as increased shortness of breath and recurrent syncope. The increased right sided pressures are also a give away with respect to the diagnosis.

The fact her aunt and mother suffered from a similar disease points to an inherited component.

The condition is recognised to account for 15-20% of cases of PPH and is due to an inherited mutation in the BMPR2 gene which codes for a receptor in the TGF beta family. Hereditary haemorrhagic telangiectasia, another cause of inherited pulmonary hypertension, also carries an autosomal dominant inheritance pattern.

The occurrence of pulmonary hypertension in a number of family members makes a de novo mutation highly unlikely.

Of the other modes of inheritance listed, only autosomal dominant is correct.



[Q: 2901] OnExamination 2012 - Respiratory

You review a 52-year-old gentleman with COPD in chest clinic three weeks after a recent admission for an exacerbation.

He has had repeated admissions to hospital with exacerbations of his COPD, but until now

has refused to quit smoking. He now reports that he is keen to quit smoking and is requesting help to achieve this.

Which of the following smoking cessation methods is most likely to be successful in this patient?

- 1- Acupuncture
- 2- Bupropion plus counselling
- 3- Counselling
- 4- Hypnosis
- 5- Nicotine replacement patches plus counselling

Answer & Comments

Answer: 5- Nicotine replacement patches plus counselling

Research has shown that medication to relieve nicotine cravings (such as nicotine patches or bupropion) coupled with counselling has the greatest potential of success, although rates of cessation are only 20%.

Bupropion is contraindicated in patients with eating disorders or a history of seizures.

It should also be avoided in patients also taking corticosteroids, antimalarials, tramadol and antidepressants, as these lower seizure threshold. Our patient is likely to be on corticosteroids at regular intervals.

Acupuncture success rates are between 5-15%, but the evidence for hypnosis is limited.



[Q: 2902] OnExamination 2012 - Respiratory

A 53-year-old dental secretary presents with a four month history of dry cough. She has never smoked.

She denies haemoptysis, weight loss and dyspnoea. There is no post nasal drip.

Her medical history consists only of hypertension for one year. She is on ramipril

2.5 mg, bendroflumethiazide 2.5 mg and amlodipine 10 mg.

On examination her JVP is not raised and her chest is clear. A CXR was requested.

What would be the most likely cause of her cough?

- 1- Allergic rhinitis
- 2- Bronchiectasis
- 3- Drug induced
- 4- Interstitial lung disease
- 5- Lung cancer

Answer & Comments

Answer: 3- Drug induced

ACE inhibitors can cause dry cough. They can then be replaced with an angiotensin receptor blocker. It is important to ask about the onset of cough and the start of a new drug.

There no history to suggest allergic rhinitis.

Bronchiectasis causes a productive cough.

Interstitial lung disease and lung cancer may be causes but they are not the most likely and in this scenario there is nothing to suggest either.



[Q: 2903] OnExamination 2012 - Respiratory

A 58-year-old man presents to the Emergency department with an acute episode of breathlessness and pleuritic-sounding chest pain.

He is currently receiving treatment for metastatic prostate cancer.

On examination he is dyspnoeic, tachycardic (heart rate of 121 bpm) and has saturations of 85% on air. His blood pressure is 107/67 mmHg.

Following assessment of his clinical probability, he is categorised as a high risk for a pulmonary embolism (PE) - Wells score 5.5.

The attending medical doctor requests a CTPA.

What treatment, if any, should this patient receive before the results of his imaging are known?

- 1- Low molecular weight heparin (LMWH)
- 2- No treatment until the result of the CTPA is known
- 3- Thrombolysis
- 4- Unfractionated heparin (UFH)
- 5- Warfarin

Answer & Comments

Answer: 1- Low molecular weight heparin (LMWH)

The latest British Thoracic Society (BTS) guidelines recommend that in the treatment of patients with a high or intermediate probability of a non-massive pulmonary embolism (PE), low molecular weight heparin should be given before imaging.

Thrombolysis should be reserved for those patients with a massive PE (with haemodynamic instability) and may be given in the absence of imaging if cardiac arrest is imminent.

Haemodynamic instability may be demonstrated by hypotension, right ventricular strain on an ECG or signs of right heart failure.

Unfractionated heparin should be considered in a massive PE, or if rapid reversal of anticoagulation may be necessary. It may also be given as a bolus dose. However LMWH is preferable to UFH due to ease of use and similar efficacy.

Warfarin therapy should only be started in a proven PE.

Management of suspected acute pulmonary embolism.



[Q: 2904] OnExamination 2012 - Respiratory

A stable hand is referred to the medical admission unit with increasing breathlessness over the last six months since starting work at a new yard.

He reports initially symptoms of dyspnoea in the evenings with a dry cough. He has also noted occasional fevers at night. His breathing has become steadily worse.

A chest x ray is performed which shows some fluffy nodular shadowing.

What is the most likely causative agent for his condition?

- 1- Avian proteins
- 2- *Epicoccum nigrum*
- 3- *Klebsiella*
- 4- *Penicillium* species
- 5- Thermophilic Actinomyces bacteria

Answer & Comments

Answer: 5- Thermophilic Actinomyces bacteria

The most common example of allergic alveolitis is farmer's lung.

This is caused by dust from mouldy hay contaminated with thermophilic Actinomyces bacteria, and as a stable hand this patient is likely to have been in close contact with this allergen. Typically symptoms tend to occur several hours after exposure. Chest x ray may demonstrate fluffy nodular shadowing or ground glass appearances.

Avian proteins are the allergen responsible for pigeon fancier's lung.

Penicillium species are responsible for respiratory disease in cheese and cork workers and are due to fungal contaminants of materials.

Klebsiella and *Epicoccum nigrum* are other bacterial causes of allergic alveolitis and are

found in contaminated water, wood shavings, etc.



[Q: 2905] OnExamination 2012 - Respiratory

A 47-year-old male presents with marked shortness of breath which has deteriorated over the last two weeks.

On examination he has a hard irregular thyroid mass and has some difficulty breathing. There appears to be no retrosternal extension and he appears clinically euthyroid.

What is the most likely diagnosis?

- 1- Anaplastic carcinoma of thyroid
- 2- Bleed into a thyroid nodule
- 3- Follicular thyroid carcinoma
- 4- Medullary thyroid carcinoma
- 5- Multinodular goitre

Answer & Comments

Answer: 1- Anaplastic carcinoma of thyroid

This patient is likely to have anaplastic carcinoma of the thyroid with compression/infiltration of the trachea causing the shortness of breath.

Bleeding into a thyroid nodule is usually associated with a rapid onset of pain.

Follicular thyroid carcinoma would be unlikely to produce such marked infiltrative features in such a short period of time. Typically patients with follicular disease would present with a nodule and/or LAP.

Medullary thyroid cancer is associated most often with multiple endocrine neoplasia (MEN) II and would be particularly unusual.

This is unlikely to be a multinodular goitre as this would be unlikely to compress the trachea unless retrosternal.

The description is more compatible with a thyroid malignancy as it has deteriorated rapidly



[Q: 2906] OnExamination 2012 - Respiratory

A 71-year-old man presents with a tender left calf and has a background history of headaches, tiredness and dizziness. He is a smoker of 20 cigarettes daily and drinks 45 units of alcohol weekly.

On examination he was plethoric, had a blood pressure of 186/102 mmHg and has a swollen, hot tender and erythematous left calf. Dopplers confirm the presence of a deep vein thrombosis.

Investigations reveal:

Haemoglobin 19 g/dl(13-18)

Haematocrit 0.58(0.40-0.52)

White cell count $12.5 \times 10^9/L$ (4-11)

Platelet count $500 \times 10^9/L$ (150-400)

Which one of the following is the most appropriate investigation to establish the diagnosis?

- 1- Abdominal ultrasound scan
- 2- Arterial blood gases
- 3- Bone marrow trephine
- 4- Leucocyte alkaline phosphatase score
- 5- Red blood cell mass

Answer & Comments

Answer: 5- Red blood cell mass

The most significant abnormality is the raised haemoglobin and haematocrit suggesting polycythaemia which in the presence of all the other features suggests secondary polycythaemia.

Therefore, the most useful and appropriate investigation will be red cell mass studies

which will distinguish between true and relative polycythaemia.

Further investigations will then be dictated by the the results of this initial test; an ultrasound scan (USS) bone marrow, etc, and blood gases may be needed after the initial red cell mass studies.

The leucocyte alkaline phosphatase score is rather outdated and seldom performed.

The raised WCC and platelet count would suggest that this is primary polycythaemia not apparent polycythaemia but red blood cell mass is still the best answer.



[Q: 2907] OnExamination 2012 - Respiratory

An 80-year-old man with a five year history of diet controlled type 2 diabetes mellitus presents with a one month history of cough and weight loss. He was a non-smoker and had difficulty expectorating.

Investigation revealed a HbA1c of 7% (3.8-6.4) but his chest x ray showed a cavitating left apical shadow.

Which of the following investigations would be most useful in establishing the cause of this lesion?

- 1- Bronchoscopy
- 2- CT scan of the chest
- 3- Gastric aspirate for acid-fast bacilli
- 4- Percutaneous lung biopsy
- 5- Sputum for acid-fast bacilli

Answer & Comments

Answer: 1- Bronchoscopy

The differential diagnosis of cavitating lung lesions is shown below.

The most likely diagnosis in this non-smoking man is post primary tuberculosis as a result of reactivation of quiescent disease. He has

several risk factors including increasing age and diabetes.

The patient is unable to produce sputum therefore undertaking a bronchoscopy with bronchial washings for microscopy staining and culture is the investigation of choice. Gastric lavage for AFB is unpleasant for the patient has a lower yield than bronchoscopy and is therefore rarely undertaken now.

Causes of cavitating masses on CXR:

Lung abscess

Tuberculosis

Fungal infection (for example, histoplasmosis, coccidioidomycosis)

Malignancy

Wegener's granulomatosis commonly

Rheumatoid arthritis (multiple)

Infarction.

Only untreated smear-positive pulmonary TB is likely to be infectious.

Active disease may be indicated by grade III/IV response to tuberculin. Eighty per cent of individuals with history of BCG vaccination have grade I/II response.

All forms of pulmonary TB may be treated equally except tuberculous pleural effusion which may require drainage (with large effusions causing breathlessness) and adjunct corticosteroids to delay reaccumulation.

Length of treatment for other forms are:

Bone TB nine months

Meningitis one year

Drug resistance two years.

Streptomycin has high activity against extracellular organisms whilst pyrazinamide has high activity against intracellular organisms.



[Q: 2908] OnExamination 2012 - Respiratory

Which of the following statements is true of infections with Mycobacterium tuberculosis?

- 1- A positive tuberculin test indicates active disease
- 2- In pregnant women treatment should not be given until after delivery
- 3- Lymph node positive disease requires longer treatment than pulmonary disease
- 4- Non-sputum producing patients are non-infectious
- 5- Pyrazinamide has high activity against active extracellular organisms

Answer & Comments

Answer: 4- Non-sputum producing patients are non-infectious



[Q: 2909] OnExamination 2012 - Respiratory

A 16-year-old boy with cystic fibrosis (CF) presents with abdominal pain.

Which of the following is most likely to be the cause?

- 1- Irritable bowel syndrome
- 2- Meconium ileus equivalent syndrome
- 3- Pyelonephritis
- 4- Renal calculi
- 5- Ulcerative colitis

Answer & Comments

Answer: 2- Meconium ileus equivalent syndrome

Meconium ileus equivalent or distal intestinal obstruction syndrome occurs in older children and adults with CF and presents with colicky

abdominal pain, distension, vomiting and failure to pass faeces.

The plain abdominal x ray confirms small bowel obstruction.

Initial management includes rehydration with intravenous fluids and oral N-acetyl cysteine.

Other gastrointestinal complications of / associations with CF include:

Liver cirrhosis

Gall bladder disease

Pancreatitis

Peptic ulceration

Hiatus hernia

Coeliac disease and

Crohn's disease.



[Q: 2910] OnExamination 2012 - Respiratory

A 41-year-old woman comes to the clinic with increasing shortness of breath. She has a history of systemic sclerosis, takes omeprazole for reflux symptoms and nifedipine slow release for Raynaud's disease.

On examination her BP is 155/85 mmHg, pulse is 82 and regular. There is peripheral calcinosis on examination of the hands and pinching of the corners of the mouth consistent with scleroderma. Auscultation of the chest reveals scattered inspiratory crackles across both lung fields.

Investigations show:

Haemoglobin 12.2 g/dl(11.5-16.0)

White cell count $8.3 \times 10^9/L$ (4-11)

Platelets $199 \times 10^9/L$ (150-400)

ESR 62 mm/hr(<10)

Sodium 138 mmol/l (135-146)

Potassium 4.3 mmol/l (3.5-5)

Creatinine 131 micromol/l (79-118)

CXR - Bilateral interstitial infiltrates.

Echocardiogram - Ejection fraction 53%.

Which of the following is the most likely diagnosis?

1- Bacterial pneumonia

2- Cryptogenic fibrosing alveolitis

3- Eosinophilic pneumonitis

4- Interstitial fibrosis

5- Pulmonary oedema

Answer & Comments

Answer: 4- Interstitial fibrosis

Interstitial fibrosis is recognised as the most common pulmonary manifestation of systemic sclerosis, and the scattered crackles on auscultation, coupled with bilateral interstitial infiltrates on chest radiograph fits best with the diagnosis.

The condition may be steroid responsive; as such a trial of prednisolone plus or minus an appropriate second line agent is indicated.

Given the chronic nature of her disease bacterial infection is unlikely.

Cryptogenic fibrosing alveolitis is by definition of unknown aetiology and this too therefore cannot be the correct answer.

Given the normal ejection fraction pulmonary oedema is also unlikely.

The absence of leukocytosis, and normal eosinophil count makes eosinophilic pneumonitis unlikely.



[Q: 2911] OnExamination 2012 - Respiratory

A 45-year-old female pigeon fancier comes to the emergency department with shortness of breath and flu-like symptoms.

She tells you that some of her birds have also been unwell.

There is no past medical history of note. On examination her BP is 110/60 mmHg, her pulse is 65 and regular, and temperature is 38.2°C. There are scattered crackles and wheeze on auscultation of the chest.

Investigations show:

Haemoglobin 11.8 g/dl (11.5-16.0)

White cell count $3.9 \times 10^9/L$ (4-11)

Platelets $193 \times 10^9/L$ (150-400)

ESR 72 mm/hr (<10)

Sodium 136 mmol/l (135-146)

Potassium 4.4 mmol/l (3.5-5)

Creatinine 118 micromol/l (79-118)

Alanine aminotransferase 102 U/l (5-40)

Alkaline phosphatase 230 U/l (39-117)

CXR - Widespread hazy opacities affecting both lower lobes.

Which of the following is the most likely diagnosis?

- 1- Avian influenza
- 2- Legionnaire's disease
- 3- Psittacosis
- 4- Streptococcus pneumoniae
- 5- Q fever

Answer & Comments

Answer: 3- Psittacosis

There are a number of signs and investigations that support a diagnosis of psittacosis in this patient. Relative bradycardia with non-specific chest signs, coupled with diffuse chest x ray changes, a low white count and abnormal LFTs are consistent with the disease. Tetracyclines are the antibiotics of choice.

Avian influenza occurs in epidemics, and as yet H5N1, the strain thought most likely to lead to a human epidemic, has not acquired the ability to spread rapidly between individuals.

Q fever is mainly transmitted by ticks and legionnaire's disease by contaminated air conditioning systems.

Given the history of bird keeping and the diffuse consolidation seen, psittacosis is more likely than streptococcal pneumonia.



[Q: 2912] OnExamination 2012 - Respiratory

A 55-year-old gentleman has recently been diagnosed with idiopathic pulmonary fibrosis. He has been on the internet researching pulmonary fibrosis and wants to know if he is suitable for steroid therapy.

Which of the following is most likely to be associated with a response to steroid therapy?

- 1- Absence of pulmonary hypertension on an ECHO
- 2- Age at diagnosis
- 3- Bronchoalveolar lavage lymphocytosis
- 4- paO_2 of 8.6 kPa
- 5- Predominant reticular pattern on HRCT

Answer & Comments

Answer: 3- Bronchoalveolar lavage lymphocytosis

There are no satisfactory treatment options for idiopathic pulmonary fibrosis (usual interstitial pneumonia/UIP). It is necessary to distinguish UIP from non-specific interstitial pneumonia (NSIP) as this is more steroid-responsive.

Bronchoalveolar lavage (BAL) lymphocytosis predicts a better corticosteroid response than the typical BAL neutrophilia.

A predominant reticular pattern on HRCT is consistent with UIP and correlates with irreversible fibrosis. The ground glass appearance often associated with NSIP indicates inflammation, which may be responsive to steroids.



[Q: 2913] OnExamination 2012 - Respiratory

A 72-year-old patient with COPD would like to spend two weeks in Australia. He lives in Manchester.

His FEV₁ is 60%. He was last admitted to hospital a year ago because of an infective exacerbation of COPD. His O₂ sat is 96% on air.

He takes regular inhalers.

What advice would you give?

- 1- Advise him not to fly
- 2- Advise inflight oxygen 28%
- 3- Advise inflight oxygen 35%
- 4- Allow flight and no oxygen required
- 5- Perform a hypoxic challenge test

Answer & Comments

Answer: 4- Allow flight and no oxygen required

History, examination, assessment of severity of chronic obstructive pulmonary disease (COPD) and O₂ sat at sea level should be performed.

Air travel advice can be reviewed in BTS guidelines.

A summary is present in the table below: (additional risk factors: hypercapnia, FEV₁ <50% predicted, lung cancer, restrictive lung disease involving the parenchyma [fibrosis], chest wall [kyphoscoliosis] or respiratory muscles, ventilator support, cerebrovascular or cardiac disease, within six weeks of discharge for an exacerbation of chronic lung or cardiac disease).

Sea level SpO₂ > 95% - Oxygen not required

Sea level SpO₂ 92-95% and no risk factor - Oxygen not required

Sea level SpO₂ 92-95% and additional risk factor - Perform hypoxic challenge test with arterial or capillary measurements

Sea level SpO₂ < 92% - In-flight oxygen

Receiving supplemental oxygen at sea level - Increase the flow while at cruising altitude.



[Q: 2914] OnExamination 2012 - Respiratory

Which of the following is true of BCG vaccination?

- 1- Is a killed polysaccharide antigen vaccine
- 2- Is contraindicated in neonates
- 3- Is presently routinely offered in the UK at age 16 years
- 4- Provides protection against leprosy
- 5- Should be given to all children who have a strongly positive tuberculin test

Answer & Comments

Answer: 4- Provides protection against leprosy

A. The BCG vaccine is an attenuated strain; it provides approximately 70% protection.

B. BCG vaccine may given to newborns at high risk of exposure.

C. BCG is given at comprehensive school entry (age 11-13). 'to 'BCGs are no longer routine for the general population at school age, only for 'at risk' groups.'

D. It has also found a use in stimulating the immune system for the treatment of some cancers.

E. It should not be given to these children. A low reactivity Heaf test (grade 0-1) should be documented before administration.



[Q: 2915] OnExamination 2012 - Respiratory

A 48-year-old woman presents to her GP with Cushingoid facies and hyperpigmentation of the skin on her face and chest. She has smoked 20 cigarettes per day for 30 years.

Examination reveals no gross abnormalities. Her chest x ray reveals a 2 cm irregularly shaped mass in the right upper lobe, in proximity to the mediastinum. A CT guided needle biopsy of the lung lesion is performed.

Which would be the most likely cytologic finding?

- 1- Adenocarcinoma
- 2- Benign bronchial adenoma
- 3- Bronchoalveolar cell carcinoma (BAC)
- 4- Small cell (oat cell) carcinoma
- 5- Squamous cell carcinoma

Answer & Comments

Answer: 4- Small cell (oat cell) carcinoma

This patient has typical features of ectopic adrenocorticotrophic hormone (ACTH) secretion which is usually due to a small cell lung cancer.

Other less common causes of ectopic ACTH secretion include bronchial carcinoids.



[Q: 2916] OnExamination 2012 - Respiratory

A 53-year-old man presents to the respiratory clinic. He has been involved in nuclear power plant construction for much of his life and has increasing shortness of breath and chronic cough over the past 12 months.

On examination his BP is 138/82 mmHg, pulse is 72 and heart sounds are normal. There are occasional crackles on auscultation of the chest.

Investigations show:

Haemoglobin 12.4 g/dl(13.5-17.7)

White cell count $10.2 \times 10^9/L$ (4-11)

Platelets $203 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (135-146)

Potassium 4.0 mmol/l (3.5-5)

Creatinine 122 micromol/l (79-118)

CXR - Bilateral hilar lymphadenopathy.

Which of the following is the most likely diagnosis?

- 1- Asthma
- 2- Berylliosis
- 3- COPD
- 4- Cryptogenic fibrosing alveolitis
- 5- Sarcoidosis

Answer & Comments

Answer: 2- Berylliosis

Exposure to beryllium is seen in the nuclear power, telecommunications, semi-conductor and electronics industries. It results in a similar clinical picture to that of sarcoidosis; in this case it is the patient's occupation that pushes us towards berylliosis as the most appropriate answer.

Sarcoidosis is the major differential here, but it is the possible exposure to beryllium because of occupation which points us away from this as the most likely diagnosis.

Cryptogenic fibrosing alveolitis would be associated with evidence of interstitial fibrosis on chest x ray.

We are not told of any smoking history consistent with chronic obstructive pulmonary disease (COPD) and there is no evidence of wheeze to suggest asthma.



[Q: 2917] OnExamination 2012 - Respiratory

A 43-year-old Caribbean female comprehensive school teacher complains of slowly increasing breathlessness. She has no smoking history.

Investigations reveal she has bilateral enlarged hilar lymph nodes, elevated serum calcium, interstitial lung disease, and enlarged liver and spleen.

What is the most likely diagnosis?

- 1- Coccidioidomycosis
- 2- Hyperparathyroidism
- 3- Hypervitaminosis D
- 4- Sarcoidosis
- 5- Tuberculosis

Answer & Comments

Answer: 4- Sarcoidosis

Sarcoid is common in subjects of Caribbean origin.

Subacute increasing breathlessness also suggests the diagnosis of sarcoid, and an elevated calcium narrows the differential diagnosis further.

Hyperparathyroidism would not cause symptoms of breathlessness.

Coccidioidomycosis is a non-infective fungal infection caused by inhalation of the spores of *Coccidioides immitis*. It usually presents with fever, cough, myalgia and rash. It is endemic mainly to the south-western USA and North Mexico.

TB is the major differential in this case.

Hypercalcaemia and bilateral hilar lymphadenomegaly (BHL) however are in favour of a diagnosis of sarcoid.



[Q: 2918] OnExamination 2012 - Respiratory

A 67-year-old man who has a long history of chronic bronchitis is admitted from home with an acute exacerbation.

Investigations show:

pCO₂ 11 kPa(4.7-6)

pO₂ 6.7 kPa(10-13.3)

Which of the following would be expected in this patient?

- 1- A metabolic acidosis with a low bicarbonate would be expected

- 2- Extensor plantar responses may be expected
- 3- Gentamicin would be a reasonable initial treatment until cultures are available
- 4- Oxygen therapy should aim to increase the pO₂ to above 8 kPa (60 mmHg)
- 5- Peripheral oedema indicates coexisting heart failure

Answer & Comments

Answer: 2- Extensor plantar responses may be expected

Together with emphysema, chronic bronchitis is part of the spectrum of respiratory disease described as chronic obstructive pulmonary disease (COPD). Chronic bronchitis itself is defined as chronic cough and sputum production for at least three months of two consecutive years in the absence of other disease which could explain these symptoms.

The ABG here demonstrates type 2 respiratory failure. The patient is likely to be acidotic, due to the raised pCO₂ - i.e. a respiratory acidosis. The bicarbonate is likely to be normal, or raised if the patient has chronic hypercapnia.

The signs and symptoms of respiratory acidosis are:

Central nervous system
Respiratory system
Cardiovascular system

Cerebral vasodilation
Breathlessness
Flushing, bounding pulse

Increased intracranial pressure
Cyanosis
Cor pulmonale

Headache, confusion, agitation
Pulmonary hypertension
Systemic hypotension

Hallucinations, transient psychosis
Arrhythmias

Myoclonic jerks, flapping tremor,

extensor plantars, depressed reflexes
Initially good cardiac output,

then decreases

Papilloedema, constricted pupils

Seizures, coma

BTS guidelines would recommend treatment of exacerbations with amoxicillin, co-amoxiclav or cephalosporin (depending on local sensitivities). Gentamicin is not usually indicated.

Oxygen should be given to maintain SaO₂ within the patient's individual target range, if available (COPD patients are being given cards with this information, so always ask). If the individual target is not known, saturations should be maintained at 88-92%. ABGs should be repeated at regular intervals to monitor response to treatment, and oxygen weaned when possible. The ABG is used to see the pH and pCO₂, and it is these values that guide treatment rather than the pO₂ alone.

Peripheral oedema may be present as a dependent oedema, as patients with COPD may have limited mobility due to dyspnoea, and therefore does not necessarily indicate heart failure.



[Q: 2919] OnExamination 2012 - Respiratory

A 24-year-old male presents after developing a bluish discolouration of the body, lips and nails. He denies any relevant past medical history.

Examination reveals a central cyanosis and a grey complexion.

Investigation revealed:

Haemoglobin 17.0 g/dl(13.0-18.0)

paO₂ 13.0 kPa(11.3-12.6)

SaO₂ (using an oximeter)85%(>95)

What is the most likely diagnosis?

- 1- Argyria
- 2- Cyanotic congenital heart disease
- 3- Haemochromatosis

4- Methaemoglobinaemia

5- Methylene blue poisoning

Answer & Comments

Answer: 4- Methaemoglobinaemia

This patient is otherwise well and has no specific features of congenital heart disease (clubbing, etc).

He appears desaturated with saturations of 85%, yet good pO₂. This is a typical description of methaemoglobinaemia, which is the accumulation of reversibly oxidised methaemoglobin causing reduced oxygen affinity of the Hb molecule with consequent cyanosis. It can occur due to an inherited condition or as a consequence of drugs such as nitrites.

Argyria is colloidal silver toxicity.



[Q: 2920] OnExamination 2012 - Respiratory

A 56-year-old woman is recently diagnosed with small cell carcinoma of the lung.

Which of the following non-metastatic manifestations is she most likely to develop?

- 1- Eaton-Lambert syndrome
- 2- Ectopic PTH-related peptide secretion
- 3- Erythema gyratum repens
- 4- Hypertrophic pulmonary osteoarthropathy (HPOA)
- 5- Myasthenia gravis

Answer & Comments

Answer: 1- Eaton-Lambert syndrome

Non-metastatic paramalignant manifestations for small cell carcinoma include:

Inappropriate ADH and ectopic ACTH secretion

Eaton-Lambert syndrome (70% occur in association with small cell carcinoma - autoimmune disorder affecting release of acetylcholine at neuromuscular junction causing proximal muscle weakness, fatiguability and muscle wasting. Often, power is increased initially by exercise - reversed myasthenia effect. Weakness and fatiguability can be improved with guanidine hydrochloride)

Polymyositis

Dementia

Cerebellar syndrome and

Peripheral neuropathy.

Cutaneous lesions (dermatomyositis, thrombophlebitis migrans, acanthosis nigricans and erythema gyratum repens) are rare.

HPOA and ectopic parathyroid hormone (PTH)-related peptide secretion relates particularly to squamous cell carcinoma.



[Q: 2921] OnExamination 2012 - Respiratory

A 24-year-old woman presents to the respiratory clinic some nine months after the birth of her first child.

She has suffered increasing shortness of breath over the past few weeks and months, so much so that she can barely walk up stairs or to the bus stop at the end of her street.

On examination she looks short of breath at rest. Her JVP is elevated and there is mild bilateral ankle swelling. Her lung fields are clear.

Investigations show:

Haemoglobin 13.2 g/dl(11.5-16.0)

White cell count $7.3 \times 10^9/L$ (4-11)

Platelets $201 \times 10^9/L$ (150-400)

Sodium 137 mmol/l (135-146)

Potassium 4.2 mmol/l (3.5-5)

Creatinine 116 micromol/l (79-118)

Echocardiogram - Evidence of pulmonary hypertension.

VQ scan - no evidence of pulmonary embolism.

Which of the following is the most appropriate initial management?

1- Beta blocker

2- Calcium antagonist

3- Endothelin receptor antagonist

4- PDE-5 inhibitor

5- Prostaglandin infusion

Answer & Comments

Answer: 3- Endothelin receptor antagonist

This woman has primary pulmonary hypertension, which often presents in women after the birth of the first child.

Calcium antagonists form the basis of initial therapy only for those patients without right sided heart failure, therefore an endothelin receptor antagonist would be initial therapy of choice. Examples of endothelin receptor antagonists include bosentan and ambrisentan. They significantly reduce pulmonary artery pressure, but adverse effects include peripheral oedema and liver function test monitoring is recommended.

Beta blockers are not recommended in the management of primary pulmonary hypertension as their major effect is on reducing peripheral blood pressure.

Calcium antagonists are effective in only 10-15% of patients and only recommended if there is no right sided heart failure.

PDE-5 inhibitors are used in mild disease, or in stage III or IV NYHA functional status in combination with endothelin receptor antagonists.

Nebulised or subcutaneous prostacyclin analogues are less convenient than oral options and tend to be reserved for combination with oral therapy.



[Q: 2922] OnExamination 2012 - Respiratory

A 29-year-old man is referred to the respiratory clinic with increasing shortness of breath. He smokes 5-10 cigarettes per day and drinks 30 units of alcohol per week. He reports wheeze and a chronic cough so his GP has been managing him for asthma.

On examination his BP is 132/72 mmHg, pulse is 80 and regular. There is scattered wheeze and coarse crackles on auscultation of the chest.

Investigations show:

Haemoglobin 13.5 g/dl (13.5-17.7)

White cell count $8.0 \times 10^9/L$ (4-11)

Platelets $232 \times 10^9/L$ (150-400)

Sodium 140 mmol/l (135-146)

Potassium 4.0 mmol/l (3.5-5)

Creatinine 115 $\mu\text{mol/l}$ (79-118)

Alanine aminotransferase 110 U/l (5-40)

CXR Predominant lower lobe emphysema

Pulmonary function testing obstructive defect, FEV 42% of predicted

According to NICE, which of the following is the most appropriate treatment?

- 1- Alpha-1-antitrypsin
- 2- Home oxygen therapy
- 3- Inhaled corticosteroids and long acting beta agonist therapy
- 4- Ipratropium as required
- 5- Rotating antibiotics

Answer & Comments

Answer: 3- Inhaled corticosteroids and long acting beta agonist therapy

Alpha-1-antitrypsin is not recommended by NICE.

We are not told about any criteria which qualify this man for home O₂ therapy.

PRN ipratropium whilst symptom relieving does not impact on his prognosis.

Rotating antibiotics may only be of value for frequent infections.



[Q: 2923] OnExamination 2012 - Respiratory

A 39-year-old chef, who arrived in the United Kingdom from Pakistan eight months ago, presents to the chest clinic with a two month history of weight loss, dry cough and night sweats.

Investigations reveal he has multi-drug-resistant tuberculosis (MDR-TB).

What is the minimum overall duration of treatment for MDR-TB once the sputum is negative?

- 1- 3 months
- 2- 6 months
- 3- 9 months
- 4- 12 months
- 5- 24 months

Answer & Comments

Answer: 3- 9 months

This question requires an understanding of the definition of MDR-TB and the differences in treatment duration.

Multi-drug-resistant TB as the name suggests is Mycobacterium tuberculosis resistant to two or more first line agents, which most commonly are isoniazid and rifampicin. There can be monoresistance to each of the first line agents, but this is not MDR-TB.

Treatment of MDR-TB is complex and time consuming.

Risk factors for acquiring MDR-TB include previous TB treatment, HIV infection, contact with drug resistant disease and treatment failure.

Initial treatment includes the use of five agents until sputum is negative and then continuation of three to which the TB is sensitive to for a minimum of nine months but sometimes up to 24 months.



[Q: 2924] OnExamination 2012 - Respiratory

A 48-year-old woman presents to the Emergency department with a one week history of a non-productive cough and increasing breathlessness. She reports her breathing is much worse on exertion.

Her past medical history includes hypertension, migraines and a renal transplant for end stage hypertensive nephropathy.

Examination reveals mild pyrexia of 37.8°C and most notably she was profoundly hypoxic with oxygen saturations of 80% on air. An arterial blood gas confirmed her hypoxia. A CXR showed some patchy bilateral infiltrates, more pronounced on the left.

She is diagnosed with community-acquired pneumonia and treated empirically with recommended antibiotics. The next day she deteriorates and requires intubation and ventilation.

What is the most likely causative organism?

- 1- Chlamydia pneumoniae
- 2- Legionella pneumophila
- 3- Pneumocystis carinii
- 4- Pneumocystis jiroveci
- 5- Pseudomonas aeruginosa

Answer & Comments

Answer: 4- Pneumocystis jiroveci

Pneumocystis is yeast-like fungal organism that can cause opportunistic infection in those who are immunocompromised.

The organism was initially described as Pneumocystis carinii, but this is the variant that causes infection in animals and not humans. The human variant of the organism is Pneumocystis jiroveci.

Classically patients with Pneumocystis pneumonia (PCP) have a dry cough, profound hypoxia and bilateral infiltrates on chest x ray.

Pseudomonas is common in hospital-acquired pneumonia, and in patients with cystic fibrosis.

The other two are atypical pathogens. However given the history and findings, PCP should be excluded first.



[Q: 2925] OnExamination 2012 - Respiratory

According to the latest NICE guidance, which of the below combinations of results is now classed as severe airflow obstruction in chronic obstructive pulmonary disease (COPD)?

Note: all values are post bronchodilator.

- 1- FEV₁/FVC <0.7 & FEV₁ predicted <30%
- 2- FEV₁/FVC <0.7 & FEV₁ predicted 30-49%
- 3- FEV₁/FVC <0.7 & FEV₁ predicted 50-79%
- 4- FEV₁/FVC <0.75 & FEV₁ predicted <30%
- 5- FEV₁/FVC <0.75 & FEV₁ predicted 30-49%

Answer & Comments

Answer: 2- FEV₁/FVC <0.7 & FEV₁ predicted 30-49%

NICE have recently (2010) produced a clinical guideline as a tool to assess airflow obstruction.

There have been some alterations to the previous classification of airflow obstruction, based on the American Thoracic Society,

GOLD and European Respiratory Society standards.

Below are the new classifications:

Mild - FEV₁ predicted more than 80%

Moderate - FEV₁ predicted 50 - 79%

Severe - FEV₁ predicted 30-49%

Very severe - FEV₁ predicted less than 30%.

FEV₁/FVC ratio is less than 0.7 in COPD.

NICE guidelines on COPD.



[Q: 2926] OnExamination 2012 - Respiratory

Carcinoid tumours of the lung (bronchial adenomas) originate from which of the following cell types?

- 1- Ciliated cell
- 2- Clara cell
- 3- Kulchitsky (K) cell
- 4- Mucus (goblet) cell
- 5- Type 2 alveolar cell

Answer & Comments

Answer: 3- Kulchitsky (K) cell

Carcinoid tumours (so called argentaffinomas, as they take up silver) are neuroendocrine cells and are derived from the K cells in the lung.



[Q: 2927] OnExamination 2012 - Respiratory

A 62-year-old man, who has worked for a long period of his life as a boiler lagger, presents to the clinic for review.

He is worried as over the past year he has suffered increasingly severe shortness of breath with a dry cough. He also reports that his fingers have begun to change shape. His

GP has given him a salbutamol inhaler but it has had little effect on his symptoms.

Other history includes smoking of 10 cigarettes per day, and hypertension for which he takes indapamide.

On examination his BP is 142/72 mmHg, his pulse is 80 and regular, and he looks short of breath at rest. There are inspiratory basal crackles.

Investigations show:

Haemoglobin 13.1 g/dl(13.5-17.7)

White cell count 7.1 x 10⁹/L (4-11)

Platelets 152 x 10⁹/L (150-400)

Sodium 138 mmol/l (135-146)

Potassium 3.9 mmol/l (3.5-5)

Creatinine 110 micromol/l (79-118)

pH 7.42(7.35-7.45)

pCO₂ 4.2 kPa(4.8-6.1)

pO₂ 9.3 kPa(10-13.3)

CXR - Nodular opacification.

What is the diagnosis?

- 1- Asbestosis
- 2- Asthma
- 3- COPD
- 4- Cryptogenic fibrosing alveolitis
- 5- Tuberculosis

Answer & Comments

Answer: 1- Asbestosis

The likely exposure to asbestos from working in the boiler industry means that the changes seen here including signs of fibrosis on examination, hypoxia and chest x ray changes are most likely to be due to asbestosis. Progressive lung fibrosis occurs, eventually leading to respiratory failure, and the fibrotic changes are non-steroid responsive.

Whilst he has been given an inhaler by his GP, there is nothing on the examination to suggest

either chronic obstructive pulmonary disease (COPD) or asthma.

Cryptogenic fibrosing alveolitis by definition has no known cause so cannot be the correct answer, and there is no history to suggest exposure to tuberculosis.



[Q: 2928] OnExamination 2012 - Respiratory

A 58-year-old woman presents with early features of COPD.

She is a heavy smoker and asks about drugs that may help her to stop smoking. In particular, she has heard about a new drug that is now available called Champix (varenicline).

Varenicline is an agent used in the treatment of smokers to help them quit.

Which of the following best describes its mechanism of action?

- 1- A tricyclic antidepressant with mostly noradrenergic properties
- 2- An α_2 -noradrenergic agonist that suppresses sympathetic activity
- 3- Is a nicotine replacement therapy
- 4- Is a partial agonist of the $\alpha_4\beta_2$ nicotinic receptor
- 5- Reduces uptake of dopamine, serotonin and norepinephrine

Answer & Comments

Answer: 4- Is a partial agonist of the $\alpha_4\beta_2$ nicotinic receptor

There are now many therapies that have been investigated for use in smoking cessation. Newer drugs are becoming available that have been specifically developed for smoking cessation. Varenicline is one of them.

Nicotine is a stimulant and releases dopamine in the brain that leads to addictive effects of smoking. Its effects can be replaced in other

ways using nicotine replacement therapy and this reduces the addiction to cigarette smoking.

Bupropion (Zyban) reduces the neuronal uptake of dopamine, serotonin and norepinephrine.

Clonidine, a second line agent in smoking cessation because of its side effects, is an α_2 -noradrenergic agonist that suppresses sympathetic activity.

Nortriptyline is a tricyclic antidepressant with mostly noradrenergic properties and is an agent that appears to be effective.

Varenicline is a non-nicotine drug that is a partial agonist of the $\alpha_4\beta_2$ nicotinic receptor.



[Q: 2929] OnExamination 2012 - Respiratory

A 9-year-old boy presents with a history of headache and persistent green nasal discharge. At night he has a cough and snores loudly. The headache is exacerbated by leaning forwards.

On examination he is afebrile, but has a persistent nasal obstruction and nasal speech. He is tender over the maxillae and forehead.

What is the most likely diagnosis?

- 1- Allergic rhinitis
- 2- Asthma
- 3- Croup
- 4- Gastroesophageal reflux
- 5- Sinusitis

Answer & Comments

Answer: 5- Sinusitis

The picture is one of upper airways obstruction associated with nasal discharge, most likely due to sinusitis.

In this case the maxillary and frontal sinuses are most likely to be involved.



[Q: 2930] OnExamination 2012 - Respiratory

A 67-year-old man presents with a long history of cough, breathlessness on minimal exertion and ankle swelling. He smokes 30-40 cigarettes per day.

Investigations are as follows:

Haemoglobin 19g/dl

White blood count 7.3

paO₂ (air) 6.2kPa

paCO₂ (air) 8.9kPa

Serum [H⁺] 44 nmol/l

Serum [HCO₃] 36 mmol/l

What is the most likely explanation of these results?

- 1- Acute respiratory acidosis
- 2- Chronic respiratory acidosis
- 3- Chronic respiratory alkalosis
- 4- Metabolic acidosis
- 5- Metabolic alkalosis

Answer & Comments

Answer: 2- Chronic respiratory acidosis

Normal range [H] = 36-44 nM. Normal range [HCO₃] = 21 - 27.5 mM.

Even if you did not know the normal reference values for H and HCO₃ you should have been able to make an intelligent guess at compensated respiratory acidosis from the clinical history, type 2 respiratory failure and probable secondary polycythaemia.



[Q: 2931] OnExamination 2012 - Respiratory

A 22-year-old man presents with increased shortness of breath, a dry cough, right sided

pleuritic chest pain and extreme lethargy.

He has no significant medical history of note but says a few other people have been ill in his class at university over the past few weeks.

On examination he is pyrexial 38.2C, BP is 110/72 mmHg, pulse is 85 and regular. There is scattered wheeze, more marked on the right than the left, but the signs seem unremarkable compared to how ill he feels.

Investigations reveal:

Haemoglobin 11.4 g/dl(11.5-16.0)

White cell count 11.9 x 10⁹/L (4-11)

Platelets 163 x 10⁹/L (150-400)

Sodium 138 mmol/l (135-146)

Potassium 4.3 mmol/l (3.5-5)

Creatinine 122 micromol/l (79-118)

ESR 83 mm/hr(<10)

CXR - Right lower lobe pneumonia.

Which of the following is the most appropriate antibiotic choice for him?

- 1- Amoxicillin
- 2- Benzyl penicillin
- 3- Ciprofloxacin
- 4- Clarithromycin
- 5- Doxycycline

Answer & Comments

Answer: 4- Clarithromycin

Epidemic pneumonia due to Mycoplasma infection is seen occasionally, and the fact that a number of his class mates have recently been ill points to this as a possible cause.

Although haemolytic anaemia and cold agglutinins are mentioned as associated phenomena, they are seen only infrequently.

Often signs on examination are less severe than would be expected once the x ray findings are reviewed, as is the case here.

Macrolides such as clarithromycin are first choice antibiotics in this case.

Amoxicillin is a reasonable oral option for community acquired pneumonia related to *S pneumoniae*, with benzyl penicillin the IV alternative.

Ciprofloxacin and doxycycline may be considered for exacerbation of chronic obstructive pulmonary disease (COPD), but neither is first line in the treatment of pneumonia.



[Q: 2932] OnExamination 2012 - Respiratory

A 62-year-old man comes to the clinic with increasing shortness of breath and a dry cough. He is known to have worked previously in the ship building industry.

On examination he is mildly short of breath at rest. There is finger clubbing and bilateral inspiratory crackles on auscultation of the chest.

It is noted on his pulmonary function testing that the DLCO is reduced.

Which of the following is likely most to affect interpretation of the test?

- 1- Consumption of two units of alcohol the night before the test
- 2- Mild kyphosis
- 3- Mild scoliosis
- 4- Smoking on the morning of the test
- 5- Use of salbutamol

Answer & Comments

Answer: 4- Smoking on the morning of the test

Although the conventional single breath diffusing capacity (DLCO) has been accepted as a standard non-invasive test to assess the integrity of pulmonary function, there are numerous pitfalls in its use.

One such pitfall is the effect of carbon monoxide in cigarette smoke, which raises carboxyhaemoglobin (COHb) to as high as 10-15% (normal value 1-2%). Most regression values for DLCO are derived from the study of lifetime non-smokers, so that the use of these in smokers underestimates the percent of predicted DLCO values, unless additional adjustments are made. Increasing COHb reduces DLCO because carbon monoxide (CO) is substantially increased, leading to a reduced driving pressure for CO across the air-blood barrier. In addition, some of the patient's haemoglobin (Hb) will already be tightly bound by CO and therefore the overall amount of Hb available for binding by the test CO is decreased.

Whilst alcohol vapours can interfere with interpretation of the test it is highly unlikely that two units of alcohol consumed the night before will have any impact at all.

Severe kyphosis and scoliosis can affect interpretation of the test, therefore DLCO should be adjusted according to the calculated alveolar volume. However, mild thoracic cage abnormalities are unlikely to have significant effects.

Salbutamol should not affect the results.



[Q: 2933] OnExamination 2012 - Respiratory

A 71-year-old man presents with severe emphysema. He is on maximal therapy including high dose Seretide and tiotropium. He tells you that he is so unwell that he can barely manage the walk of 200 metres to the corner shop.

On examination he looks short of breath at rest. His BP is 155/72 mmHg, pulse is 75 and regular. There are quiet breath sounds, occasional coarse crackles and wheeze on auscultation of the chest.

Investigations show:

Haemoglobin 14.1 g/dl(13.5-17.7)

White cell count $8.1 \times 10^9/L$ (4-11)
 Platelets $292 \times 10^9/L$ (150-400)
 Sodium 136 mmol/l (135-146)
 Potassium 4.0 mmol/l (3.5-5)
 Creatinine 123 micromol/l (79-118)
 pH 7.42(7.35-7.45)
 pCO_2 7.4 kPa(4.8-6.1)
 pO_2 9.8 kPa(10-13.3)
 CXR - Predominant upper lobe emphysema.
 FEV₁ - 30% of predicted.

Which of the features of his history, examination or investigations would preclude referral for lung reduction surgery?

- 1- pCO_2 7.4
- 2- pO_2 9.8
- 3- FEV₁ 30% predicted
- 4- Predominant upper lobe emphysema
- 5- Severe limitation of exercise capacity

Answer & Comments

Answer: 1- pCO_2 7.4

Very mild hypoxia (pO_2 is just below the lower limit of normal) need not necessarily preclude referral for lung reduction surgery, but CO_2 retention does. The upper cut off for referral for lung reduction surgery for pCO_2 is 7.3; as such he is unsuitable for referral.

Severe limitation of exercise capacity despite maximal therapy is an indication for referral for lung reduction surgery. Other factors include predominant upper lobe emphysema, FEV₁ greater than 20% predicted, and TLCO greater than 20% predicted.

Patients should of course also have undergone a period of pulmonary rehabilitation prior to considering surgery.



[Q: 2934] OnExamination 2012 - Respiratory

A patient is admitted to the intensive care unit for ventilatory support several hours after being admitted to the emergency department following a near drowning incident.

He is extremely hypoxic and a chest x ray shows bilateral infiltrates. He is diagnosed with acute respiratory distress syndrome (ARDS).

Which of the following is a direct pulmonary cause of ARDS?

- 1- Anaphylaxis
- 2- Burns
- 3- Post arrest
- 4- Sepsis
- 5- Tuberculosis

Answer & Comments

Answer: 5- Tuberculosis

This question addresses the phenomena of ARDS and its causes both direct and indirect.

Direct pulmonary causes include:

Inhalation of gastric contents (pH <2)

Infective (pneumonia, tuberculosis)

Pulmonary trauma

Near drowning

Toxic gas inhalation and

Oxygen toxicity.

Indirect causes include:

Sepsis

Non-thoracic trauma

Uraemia

Bowel infraction

Anaphylaxis and

Burns.

ARDS mortality is generally high (40%), but is determined by the cause with aspiration pneumonia having a mortality rate of almost 80% when associated with ARDS.



[Q: 2935] OnExamination 2012 - Respiratory

Which one of the following is true regarding acute pulmonary embolism?

- 1- A normal ECG excludes the diagnosis
- 2- Embolectomy is more effective than thrombolysis in improving survival
- 3- Heparin is as effective as thrombolytic therapy
- 4- The presence of hypoxaemia is an indication for thrombolysis
- 5- Thrombolysis administered through a peripheral vein is as effective as through a pulmonary artery catheter

Answer & Comments

Answer: 5- Thrombolysis administered through a peripheral vein is as effective as through a pulmonary artery catheter

Embolectomies are rarely done nowadays due to the excellent results with thrombolysis.

Thrombolytic therapy is reserved for those with severely compromised circulation (equally effective through peripheral vein or via catheter in pulmonary artery).

Heparin reduces the risk of further embolism (anticoagulant) and reduces pulmonary vasoconstriction.



[Q: 2936] OnExamination 2012 - Respiratory

A 56-year-old man presents with night time sweats, nocturia, poor concentration and daytime somnolence.

To which of the following conditions does this diagnosis predispose?

- 1- Hypoglycaemia
- 2- Hypotension
- 3- Insulin sensitivity
- 4- Osteoporosis
- 5- Stroke

Answer & Comments

Answer: 5- Stroke

This history is typical of sleep apnoea.

Sleep apnoea is an independent risk factor for stroke (and death from all causes), and is associated with hypertension, impaired glucose tolerance (IGT) and insulin resistance.

Severe Sleep Apnea and Risk of Ischemic Stroke in the Elderly.

Stroke 2006. 37. 2317-2321



[Q: 2937] OnExamination 2012 - Respiratory

A 68-year-old gentleman with a 45 year pack history is referred to the respiratory clinic by his GP with increasing breathlessness over the last 12 months.

He has a cough productive of clear sputum, which appears to be present most days. He has no weight loss and no history of haemoptysis.

His spirometry results are as follows;

FEV₁/FVC 0.65%

FEV₁ (% predicted) 71%

Based on the latest NICE guidelines, what (if any) is the severity of this gentleman's airflow obstruction?

- 1- Mild
- 2- Moderate
- 3- No airflow obstruction
- 4- Severe

5- Very severe

Answer & Comments

Answer: 2- Moderate

In 2010 NICE produced a clinical guideline as a tool to assess airflow obstruction. There have been some alterations to the previous classification of airflow obstruction, based on the American Thoracic Society, GOLD and European Respiratory Society standards.

Below are the new classifications:

Mild - FEV₁ predicted >80%

Moderate - FEV₁ predicted 50 - 79%

Severe - FEV₁ predicted 30-49%

Very severe - FEV₁ predicted <30%.

These guidelines can be found at:

<http://www.nice.org.uk/nicemedia/live/13029/49399/49399.pdf>



[Q: 2938] OnExamination 2012 - Respiratory

A 40-year-old man is undergoing investigation for acromegaly.

MRI of the pituitary fossa is normal, but a routine chest x ray reveals a large centrally based mass. The patient is a non-smoker.

What is the most likely type of this lung tumour?

- 1- Adenocarcinoma
- 2- Carcinoid
- 3- Large cell
- 4- Small cell
- 5- Squamous cell

Answer & Comments

Answer: 2- Carcinoid

A centrally based mass in a non-smoker showing clinical evidence of neuroendocrine

cell origin is consistent with a carcinoid and surgery offers a very high chance of cure.



[Q: 2939] OnExamination 2012 - Respiratory

A 75-year-old woman presents with an acute infective exacerbation of her longstanding chronic obstructive airways disease.

Blood gas analysis whilst she was receiving oxygen shows:

pH 7.14 (7.36-7.44)

pO₂ 18 kPa (11.3-12.6)

pCO₂ 10.5 kPa (4.7-6.0)

What is the most appropriate immediate management for this patient?

- 1- CPAP
- 2- Doxapram infusion
- 3- Invasive ventilation
- 4- Nebulised salbutamol with ipratropium
- 5- Reduce inspired oxygen concentration

Answer & Comments

Answer: 5- Reduce inspired oxygen concentration

This patient's blood gases show she is receiving too high a concentration of oxygen which is likely to have precipitated her hypercapnic acidosis.

Patients with chronic obstructive airways disease (COPD) should not in general receive more than 24-28% oxygen without arterial blood gas monitoring. Reduction of FiO₂ may be sufficient to improve this lady's acidosis.

Once this is done she should be treated with nebulised bronchodilators driven on air and if she fails to improve despite controlled oxygen and bronchodilators non-invasive ventilation (NIV) is indicated.



[Q: 2940] OnExamination 2012 -

Respiratory

In restrictive lung disease due to respiratory muscle weakness, which of the following statements is true?

- 1- Low FEV₁/FVC, high RV/TLC
- 2- Low FEV₁/FVC, normal TLC
- 3- Low VC, low FEV₁, normal TLC, low RV/TLC
- 4- Low VC, low RV, low TLC
- 5- Low VC, low TLC, high RV/TLC

Answer & Comments

Answer: 5- Low VC, low TLC, high RV/TLC

The lung is itself can function normally yet muscle weakness will result in grossly low lung volumes including forced expiratory volume in one second (FEV₁), forced vital capacity (FVC) and total lung capacity (TLC).

However residual volume (RV) will be relatively high as a consequence of this weakness.

Consequently, RV/TLC will be elevated.

However the transfer of carbon monoxide (TCO) will be unaffected.



[Q: 2941] OnExamination 2012 - Respiratory

An 18-year-old attending the emergency department is noted to have central cyanosis.

She is perfectly well but was told to go to the emergency department by her friends who said she looked blue.

What is the most likely cause?

- 1- Anorexia nervosa
- 2- Carbon monoxide poisoning
- 3- Drinking water contaminated with nitrates
- 4- Lead poisoning
- 5- Severe anaemia

Answer & Comments

Answer: 3- Drinking water contaminated with nitrates

This is typical of methaemoglobinaemia which may be caused by nitrates.



[Q: 2942] OnExamination 2012 - Respiratory

A 35-year-old homeless gentleman is admitted to the acute medical unit with a four month history of cough, weight loss and night sweats.

A chest x ray is highly suggestive of miliary tuberculosis (TB).

Which of the following statements is true regarding this condition?

- 1- A negative tuberculin test excludes diagnosis
- 2- A normal chest x ray excludes this diagnosis
- 3- Anti-TB drugs should not be given unless patient is sputum positive (for acid fast bacilli)
- 4- Nodules are typically 4-6 mm
- 5- Tuberculous meningitis is also seen in 15-20% of patients with miliary TB

Answer & Comments

Answer: 5- Tuberculous meningitis is also seen in 15-20% of patients with miliary TB

Fifteen per cent to 20% of patients who have miliary TB also have TB meningitis at the time of presentation. Conversely 33% of patient with TB meningitis have concomitant miliary TB.

The tuberculin test is often negative.

A chest x ray may be normal in up to one third of patients.

The classic millet seed nodules are small measuring about 1-2 mm.

Not all patients will be sputum positive and with evidence supporting a diagnosis of tuberculosis treatment should be commenced swiftly.



[Q: 2943] OnExamination 2012 - Respiratory

A 74-year-old gentleman with known metastatic carcinoma of the pancreas presents with an acute episode of dyspnoea and pleuritic-sounding chest pain.

He is tachycardic with a rate of 118 bpm and his oxygen saturations on pulse oximetry are 84% on 2L of oxygen.

He is investigated for a presumed pulmonary embolism and a CTPA confirms a clot in the right middle lobe.

Which of the following forms part of the Wells scoring criteria for pulmonary embolism?

- 1- Chest pain
- 2- Classical ECG changes (S1Q3T3)
- 3- Haemoptysis
- 4- Signs of right ventricular failure
- 5- Widened A-a gradient on arterial blood gas sampling

Answer & Comments

Answer: 3- Haemoptysis

Although all the above answers are features associated with pulmonary embolism, only haemoptysis forms part of the Wells score.

The Wells scoring system was devised in 1995 by Wells et al, and is a prediction tool based on clinical criteria.

The Wells score:

Clinically suspected DVT - 3.0 points

Alternative diagnosis less likely than a PE - 3.0 points

Tachycardia - 1.5 points

Immobilisation or surgery in the previous four weeks - 1.5 points

History of DVT or PE - 1.5 points

Haemoptysis - 1.0 point

Malignancy (treatment for within six months, palliative) - 1.0 point.

Traditional interpretation:

Score >6.0 - High

Score 2.0 to 6.0 - Moderate

Score <2.0 - Low.

Alternate interpretation:

Score > 4 - PE likely. Consider diagnostic imaging.

Score 4 or less - PE unlikely. Consider D-dimer to rule out PE.



[Q: 2944] OnExamination 2012 - Respiratory

A 40-year-old gentleman is referred to the chest clinic with worsening asthma symptoms. He had been diagnosed with late onset asthma aged 35 years.

On questioning the patient reports a short history of malaise, fever and tender subcutaneous nodules on his legs. He has had no haemoptysis.

A full blood count is performed and the results are as follows:

Hb 14.5 g/dl(11.5-16g/dl)

PLT $240 \times 10^9/L$ ($4-11 \times 10^9/L$)

WBC $12.5 \times 10^9/L$ (neut 7.8, lymph 2.5, monocytes 0.1, eosinophils 2.0, basophils 0.09) ($4-11 \times 10^9/L$)

A full blood count from three years earlier was reviewed and its results were as follows:

Hb 12.5 g/dl (11.5-16g/dl)

PLT $162 \times 10^9/L$ ($4-11 \times 10^9/L$)

WBC $9.5 \times 10^9/L$ (neut 5.5, lymph 3.5, monocytes 0.5, eosinophils 0.9, basophils 0.1) ($4-11 \times 10^9/L$)

A chest x ray is performed which shows patchy pulmonary infiltrates.

Given the patient's history and the results of initial investigations, which is the most likely diagnosis?

- 1- Acute respiratory distress syndrome
- 2- Churg-Strauss syndrome
- 3- Intrinsic asthma
- 4- Microscopic polyangiitis
- 5- Wegener's granulomatosis

Answer & Comments

Answer: 2- Churg-Strauss syndrome

This patient has

Asthma

Eosinophilia

Pulmonary infiltrates and

Neuropathy

which is diagnostic of Churg-Strauss syndrome.

Churg-Strauss is a medium/small vessel vasculitis. Most patients have a history of asthma and eosinophilia that may predate vasculitis by up to a decade.

Wegener's granulomatosis (WG) predominately involves the upper and lower respiratory system and renal glomeruli. It usually presents with upper airway symptoms.

Microscopic polyangiitis is microscopically similar to WG, but does not tend to involve the nasopharynx. It has an association with hepatitis B and C.

Acute respiratory distress syndrome describes an acute diffuse inflammatory lung injury, often in previously healthy lungs.

The presence of systemic symptoms makes a diagnosis of asthma alone unlikely.



[Q: 2945] OnExamination 2012 - Respiratory

A 38-year-old man presents with a two week history of recurrent haemoptysis which he has noted over the last 18 months.

He is unaware of any chest pain and is a smoker of five cigarettes daily.

A chest x ray reveals collapse of the left lower lobe.

What is the most likely diagnosis?

- 1- Bronchial carcinoid
- 2- Bronchial carcinoma
- 3- Bronchiectasis
- 4- Inhaled foreign body
- 5- Pulmonary embolism

Answer & Comments

Answer: 1- Bronchial carcinoid

The most likely diagnosis is of a carcinoid tumour.

These are slow growing tumours of the lung that occur in younger patients than do bronchial carcinoma, the peak incidence is when patients are in their 40s. They account for between 1-5% of all lung tumours.

They are not linked with smoking. The incidence is equal between men and women.

They usually present with recurrent haemoptysis or infections. Chest pain, breathlessness, wheeze and cough are less common.

They usually occur in the major bronchi, 85% can be seen bronchoscopically.

A carcinoid tumour in the left lower lobe bronchus could cause distal collapse of the left lower lobe.



[Q: 2946] OnExamination 2012 - Respiratory

A 45-year-old male with type 2 diabetes presented to the clinic as his wife complained that he snored excessively.

Which of the following would suggest a diagnosis of obstructive sleep apnoea?

- 1- Daytime sleepiness
- 2- Nasal polyps
- 3- Nocturnal cough
- 4- Poor memory
- 5- Stridor

Answer & Comments

Answer: 1- Daytime sleepiness

The typical problem associated with sleep apnoea syndrome is excessive daytime somnolence, associated with:

Obesity
Acromegaly
Hypothyroidism
Cushing's syndrome.

It is thought that the somnolence is due to the interruption of rapid eye movement (REM) sleep by frequent episodes of waking due to apnoeic episodes.



[Q: 2947] OnExamination 2012 - Respiratory

Progressive massive fibrosis (PMF) is most likely to be found in which of the following?

- 1- Complicated silicosis
- 2- Extrinsic allergic alveolitis
- 3- Lobar pneumonia
- 4- Sarcoidosis
- 5- Simple coal worker's pneumoconiosis

Answer & Comments

Answer: 1- Complicated silicosis

Progressive massive fibrosis is diagnosed by chest x ray as round masses, several centimetres in diameter usually in the upper lobes. They may have necrotic centres.

In silicosis a more accurate term is 'conglomerate nodules'. It is due to exposure to dust of high silicon content and hence PMF is more likely with higher silicon exposure than in simple coal worker's lung.



[Q: 2948] OnExamination 2012 - Respiratory

A 38-year-old gentleman with known emphysema secondary to alpha 1-antitrypsin (A1AT) deficiency attends the local chest clinic for follow up. He is also known to have liver cirrhosis.

Which of the following conditions is associated with A1AT deficiency?

- 1- Bladder carcinoma
- 2- Churg-Strauss vasculitis
- 3- Polyarteritis nodosa
- 4- Primary biliary cirrhosis
- 5- Pulmonary fibrosis

Answer & Comments

Answer: 1- Bladder carcinoma

A1AT deficiency is has associations with a number of varied conditions.

A1AT deficiency is associated with a number of malignancies including hepatocellular cancer, lung cancer, bladder cancer and lymphoma.

Other associated conditions include

Cirrhosis
Pancreatitis
Gall stones

COPD

Bronchiectasis

Primary sclerosing cholangitis

Wegener's granulomatosis and

Pelvic prolapse.



[Q: 2949] OnExamination 2012 - Respiratory

Which of the following is true regarding primary pulmonary tuberculosis?

- 1- Commonly leads to miliary TB
- 2- Is highly infective
- 3- Leads to pleural effusion
- 4- May be totally asymptomatic
- 5- Usually produces cavitation

Answer & Comments

Answer: 4- May be totally asymptomatic

Primary pulmonary tuberculosis is often asymptomatic consisting of primary complex.

Cavitation and pleural effusions are manifestations of post primary TB.



[Q: 2950] OnExamination 2012 - Respiratory

A 55-year-old man who has a 25 year pack history of smoking presents with productive cough with mucoid sputum of two year duration.

On examination he has scattered rhonchi and wheezing.

The likeliest diagnosis is:

- 1- Bronchial asthma
- 2- Bronchiectasis
- 3- Chronic bronchitis
- 4- Fibrosing alveolitis
- 5- Pneumonitis

Answer & Comments

Answer: 3- Chronic bronchitis

Chronic bronchitis is one of the most common respiratory diseases due to cigarette smoking.

The smoking history and productive cough for at least two years is indicative of chronic bronchitis.



[Q: 2951] OnExamination 2012 - Respiratory

Which of the following statements is not true of primary pulmonary tuberculosis?

- 1- A positive tuberculin skin test develops within two weeks of infection
- 2- It is characteristically asymptomatic
- 3- Miliary spread is commoner in a younger age group
- 4- Pleural effusion occurs before tuberculin skin testing is positive
- 5- The initial immunological response causes hilar lymphadenopathy

Answer & Comments

Answer: 1- A positive tuberculin skin test develops within two weeks of infection

Primary TB is usually asymptomatic with miliary TB most likely to occur in young children.

The Ghon focus is the area of consolidation from cellular infiltration and response to uptake of organisms by macrophages which transform into epithelioid cells and group into granulomata. Bacilli are transported via lymphatics early in the disease process to regional lymph nodes to cause marked lymphadenopathy.

Pleural and pericardial infections (which can result in effusions) occur at or shortly after primary infection.

Positive tuberculin test occurs between three weeks and three months after primary infection.



[Q: 2952] OnExamination 2012 - Respiratory

A 58-year-old man presents with weight loss and haemoptysis. He has smoked most of his life.

On examination he is clubbed and has clinical evidence of right pleural effusion. His serum calcium is 3.2 mM (2.2-2.6 mmol/l). A bone scan is normal.

From which of the following histological type of lung cancer is he most likely to suffer?

- 1- Adenocarcinoma
- 2- Large cell carcinoma
- 3- Mesothelioma
- 4- Small cell carcinoma
- 5- Squamous cell carcinoma

Answer & Comments

Answer: 5- Squamous cell carcinoma

Hypercalcaemia in absence of bony metastases occurs in about 15% of squamous cell lung carcinoma from parathyroid hormone related protein (PTHrP) production. This is a feature of non-metastatic manifestation of malignancy.

Inappropriate antidiuretic hormone (ADH) secretion (hyponatraemia) and ectopic adrenocorticotrophic hormone (ACTH) production (Cushing's syndrome) occur with small cell lung cancer.

Clubbing is predominantly associated with squamous cell cancers and occasionally adenocarcinoma.



[Q: 2953] OnExamination 2012 - Respiratory

A 72-year-old man with severe COPD presents

to the clinic for review.

He is on maximal Seretide and tiotropium inhalers yet is suffering from significant shortness of breath and is able to walk only 50-100 m before having to stop.

On examination his BP is 148/88 mmHg, pulse is 82 (atrial fibrillation), there are coarse crackles and wheeze on auscultation of the chest.

Investigations show:

Haemoglobin 18.5 g/dl(13.5-17.7)

White cell count $9.1 \times 10^9/L$ (4-11)

Platelets $280 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 4.2 mmol/l (3.5-5)

Creatinine 120 micromol/l (79-118)

pH 7.40 (7.35-7.45)

pCO₂ 6.1 kPa(4.8-6.1)

pO₂ 7.8 kPa(10-13.3)

Which of the above features is an indication for LTOT?

- 1- pCO₂ 6.1
- 2- pO₂ 7.8
- 3- Hb 18.5 with current ABG results
- 4- Presence of atrial fibrillation
- 5- Significant exercise limitation

Answer & Comments

Answer: 3- Hb 18.5 with current ABG results

Ordinarily pO₂ above 7.3 would not be an indication for long term oxygen therapy (LTOT), however if the pO₂ is between 7.3 and 8.0, then O₂ may be prescribed if secondary polycythaemia (as here), or pulmonary hypertension are present.

pO₂ 7.8 is an indication for LTOT only if there is coexistent polycythaemia or pulmonary hypertension.

Hypercarbia, significant exercise limitation or atrial fibrillation are not in their own right indications for LTOT.



[Q: 2954] OnExamination 2012 - Respiratory

A 30-year-old man is referred to the chest clinic with an eight month history of progressive shortness of breath. He has smoked 20/day for 15 years.

Investigations reveal a diagnosis of severe panacinar emphysema. On questioning he informs the consultant that his father died from COPD in his early 40s. Following a diagnosis of alpha-1 antitrypsin (A1AT) deficiency, he undergoes genetic testing.

Given his history what is most likely to be his genotype?

- 1- PiMM
- 2- PiMS
- 3- PiSZ
- 4- PiZZ
- 5- PiSS

Answer & Comments

Answer: 4- PiZZ

The genotype PiZZ is associated with the most severe form of alpha 1-antitrypsin deficiency as the circulating levels of A1AT are 10-15% of normal.

The serum levels of some of the other common genotypes are:

PiMM: 100% (normal)

PiMS: 80% of normal serum level of A1AT

PiSS: 60% of normal serum level of A1AT

PiMZ: 60% of normal serum level of A1AT

PiSZ: 40% of normal serum level of A1AT.

Cigarette smoking is especially harmful to those with A1AT deficiency and can accelerate the progression of emphysema by 10 years.



[Q: 2955] OnExamination 2012 - Respiratory

A 39-year-old gentleman is referred to the chest clinic with an eight month history of progressive shortness of breath. He has smoked 20/day for 20 years.

Investigations reveal a diagnosis of moderate emphysema. On questioning he informs the consultant that his father died from COPD in his early 50s. Following a diagnosis of alpha-1 antitrypsin (A1AT) deficiency, he undergoes genetic testing and is found to have the PiSZ genotype.

What levels of alpha1 antitrypsin would be expected if they were to be measured?

- 1- 10% of normal
- 2- 20% of normal
- 3- 40% of normal
- 4- 60% of normal
- 5- 80% of normal

Answer & Comments

Answer: 3- 40% of normal

The serum levels of some of the common genotypes are:

PiMM: 100% (normal)

PiMS: 80% of normal serum level of A1AT

PiSS: 60% of normal serum level of A1AT

PiMZ: 60% of normal serum level of A1AT

PiSZ: 40% of normal serum level of A1AT

PiZZ: 10-15% (severe alpha 1-antitrypsin deficiency).

Cigarette smoking is especially harmful to those with A1AT deficiency and can accelerate the progression of emphysema by 10 years.



[Q: 2956] OnExamination 2012 - Respiratory

A 19-year-old smoker presents to the Emergency department with right sided pleuritic chest pain and dyspnoea. He has no previous medical history.

His BP is 120/75 mmHg. A CXR is done and confirms a right sided pneumothorax with a rim of 2.5 cm.

Aspiration was done and was successful. He is about to go on holiday abroad in three days time.

Which of the following advice would you give?

- 1- Advise not to drive
- 2- Advise not to swim
- 3- Allow flight but advise not to do any diving
- 4- Do not advise any flight for at least one week
- 5- Repeat CXR before the flight and allow if no residual pneumothorax

Answer & Comments

Answer: 4- Do not advise any flight for at least one week

Atmospheric air drops during flights and increases in deep sea diving can cause recurrence of pneumothorax. This is due to expansion and rupture of pulmonary blebs. Many commercial airlines previously advised a 6-week interval between pneumothorax and air travel, but this has now been amended to 1 week following full resolution. However, the British Thoracic Society emphasises that the recurrence risk only significantly falls after 1 year, and therefore in the absence of a definitive surgical procedure patients might wish to defer travel until then.



[Q: 2957] OnExamination 2012 - Respiratory

A 19-year-old smoker presents to the Emergency department with right sided

pleuritic chest pain and dyspnoea. He has no previous medical history.

His BP is 120/75 mmHg. A CXR is done and confirms a right sided pneumothorax with a rim of 2.5 cm.

Which of the following is the best course of action?

- 1- Advise to stop smoking and discharge
- 2- Aspirate
- 3- Check arterial blood gases and only if hypoxic aspirate
- 4- Insert a chest drain
- 5- Repeat the CXR in two hours

Answer & Comments

Answer: 2- Aspirate

Aspiration is indicated in spontaneous primary pneumothorax if breathless and/or there is a rim of air greater than 2 cm on chest x ray.

Blood gases will not affect the decision making in the above scenario.

Chest drain is not indicated at this stage.

It is important to read the pneumothorax guidelines for the British Thoracic Society.



[Q: 2958] OnExamination 2012 - Respiratory

A 47-year-old male presents with shortness of breath.

He has cirrhosis secondary to hepatitis C infection.

He gives a chronic history of progressive shortness of breath on exertion, and now gets short of breath walking up steps. He gives a history of being more short of breath whilst sitting up, preferring to sleep with no pillows.

The blood pressure is 110/70 mmHg, heart rate 85 beats per minute, and pulse oximetry, breathing room air, shows saturations of 95% lying flat and 87% sitting up.

Which of the following tests is the most appropriate to confirm the diagnosis?

- 1- Contrast echocardiography
- 2- High resolution CT chest
- 3- MRI chest
- 4- Pulmonary angiography
- 5- V:Q scan

Answer & Comments

Answer: 1- Contrast echocardiography

This patient has hepatopulmonary syndrome. Platypnoea and orthodeoxia are typical of this syndrome.

A greater than 5% desaturation on sitting up is very suggestive of this condition which complicates liver cirrhosis and is characterised by pulmonary arteriovenous malformations.

Contrast echo is the diagnostic tool of choice.

Visualisation of late-appearing bubbles in the left atrium following the injection of agitated saline is strongly suggestive of a pulmonary arteriovenous shunt.



[Q: 2959] OnExamination 2012 - Respiratory

A 34-year-old woman with severe asthma comes to the clinic for review. She is currently taking 800 mcg per day of inhaled beclomethasone, yet still feels significantly short of breath and is coughing at night nearly every night.

On examination her PEFR is 340, compared to 500 predicted. She has extensive wheeze on auscultation of both lung fields.

Which of the following is the most appropriate next intervention?

- 1- Add salmeterol 50 mg/day
- 2- Change to fluticasone 400 mcg/day
- 3- Increase beclomethasone to 1600 mcg/day
- 4- Start montelukast 10 mg/day

- 5- Start prednisolone 5 mg/day

Answer & Comments

Answer: 1- Add salmeterol 50 mg/day

BTS guidelines suggest that adding in a long-acting beta 2 agonist (LABA) is more appropriate than further increasing inhaled corticosteroids.

A change to fluticasone 400 mcg/day is essentially maintaining the status quo, as fluticasone is roughly twice as potent as beclomethasone.

If control was not reached after addition of the LABA, then montelukast would be a reasonable next step.



[Q: 2960] OnExamination 2012 - Respiratory

A 25-year-old man presents to the Emergency department with shortness of breath.

One week ago he developed influenza and has become more short of breath and fatigued in the last 24 hours.

His temperature is 38.5°C, his SaO₂ is 90% on 2L of oxygen, a blood pressure 100/60 mmHg and heart rate 120/min.

The CXR shows patchy consolidation.

Which antibiotic therapy should you select for this man?

- 1- Amoxicillin
- 2- Amoxicillin and flucloxacillin
- 3- Co-amoxiclav and clarithromycin
- 4- Co-amoxiclav
- 5- Flucloxacillin

Answer & Comments

Answer: 3- Co-amoxiclav and clarithromycin

This gentleman has community acquired pneumonia (CAP). The recent history of

influenza may lead you to consider staphylococcus aureus as the possible underlying organism, although this is an uncommon cause of CAP in the UK. It is more common in the winter months, and coincident influenza-type symptoms in approximately 40%. Pneumonia complications approximately 3% of cases of influenza, 10% of those admitted have been confirmed to be due to Staphylococcus aureus.

In the majority of patients CAP should be confirmed by chest radiography before the commencement of antibiotics. However, if patients are critically unwell they should be treated for the presumptive diagnosis. Antibiotic treatment should always be initiated within 4 hours of presentation.

CAP caused by Staphylococcus aureus is more likely to present with multilobar shadowing, cavitation, pneumatoceles and spontaneous pneumothorax than other organisms. However, there are no characteristic features of chest radiographs that allow a confident prediction of the likely pathogen. Therefore, the general guidelines for treatment of CAP should be followed until an organism is identified. Staphylococcus aureus carries a high mortality, and therefore if suspected treatment should initially be for a severe CAP (see below for details).

Low severity CAP (CURB 0-1) can be treated with amoxicillin 500mg TDS PO. CURB 2 CAP should be treated with amoxicillin 500mg-1g TDS and clarithromycin 500mg TDS. Alternatives are available if patients are allergic to any of the above combinations. High severity CAP (CURB 3-5) should be treated as soon as possible with co-amoxiclav 1.2g TDS and clarithromycin 500mg BD.

The oral route is recommended in those with low and moderate severity CAP. Patients treated with parenteral antibiotics initially should be switched to an oral regimen once clinical improvement is seen and the patients has been afebrile for at least 24 hours. For

most patients with uncomplicated CAP 7 days of antibiotic treatment is recommended. For those with high severity pneumonia where an organism has not been identified, 7-10 days treatment is indicated and extended to 14-21 days where clinically needed.

If Staphylococcus aureus is identified, treatment should be altered. Non-MRSA organisms should be treated with flucloxacillin and/or rifampicin; an alternative for penicillin-allergic patients is teicoplanin and rifampicin. MRSA should be treated with vancomycin. A prolonged antibiotic course is indicated.



[Q: 2961] OnExamination 2012 - Respiratory

A 42-year-old woman presents with an acute attack of asthma. She is able to speak in short sentences.

Her respiratory rate is 28 breaths per minute and the peak expiratory flow rate 120 L/min (predicted 480 L/min).

What is the most appropriate treatment for this patient?

- 1- Intravenous aminophylline
- 2- Intravenous salbutamol
- 3- Nebulised salbutamol
- 4- Oral salbutamol
- 5- Oral theophylline

Answer & Comments

Answer: 3- Nebulised salbutamol

This patient has features of acute severe asthma, and should be given oxygen, steroids and nebulised salbutamol as immediate treatment.

Although the PFR is less than 33% of predicted normal (feature of life-threatening attack), we do not know what her previous best is. It could be low, for example, 240 L/min.

If it had been a life-threatening attack, nebulised ipratropium and intravenous aminophylline, salbutamol or terbutaline should be given. The guidelines do not specify a preference.

This is another clue that the answer should be nebulised salbutamol.



[Q: 2962] OnExamination 2012 - Respiratory

The pulmonary vascular system is different from the systemic circulation in that the pulmonary system demonstrates which of the following?

- 1- High pressures, high flow rates, highly compliant vessels
- 2- High pressures, high flow rates, low compliance vessels
- 3- Low pressures, high flow rates, high compliance vessels
- 4- Low pressures, low flow rates, high compliance vessels
- 5- Low pressures, low flow rates, low compliance vessels

Answer & Comments

Answer: 4- Low pressures, low flow rates, high compliance vessels

The normal pulmonary circulation is characterised by low pressures, low flow rates, high compliance vessels.



[Q: 2963] OnExamination 2012 - Respiratory

Which of the following statements is true regarding smoking in pregnancy?

- 1- Dysmorphic facies is a recognised complication.
- 2- Maternal smoking may adversely affect testicular function in male children.

- 3- Smoking assists in maturation of the fetal lung.
- 4- The newborn baby may require adjustments in drug dosages because of it.
- 5- The reduction in birth weight is related to the number of cigarettes smoked per day.

Answer & Comments

Answer: 5- The reduction in birth weight is related to the number of cigarettes smoked per day.

Smoking reduces birth weight which may be of critical importance if the baby is born pre-term.

On average, the babies of smokers weigh 170 g less than non-smokers, but the reduction in birth weight is related to the number of cigarettes smoked per day.

Smoking is also associated with an increased risk of miscarriage and still birth. The infant has a greater risk of sudden infant death syndrome.

There is some evidence that maternal smoking may adversely affect ovarian function in female children.

No dysmorphic syndrome has yet been described.



[Q: 2964] OnExamination 2012 - Respiratory

A 45-year-old woman is referred to the respiratory clinic with shortness of breath. She has been unable to work due to a long term back injury and is therefore on long term sickness benefit.

On examination her BP is 155/85 mmHg, pulse is 85 and regular. Her BMI is 32, there is bilateral lower limb pitting oedema with varicose vein formation. Heart sounds are normal, auscultation of the chest is clear.

Investigations show:

pH 7.43 (7.35-7.45)

pCO₂ 5.8 kPa (4.8-6.1)

pO₂ 9.9 kPa (10-13.3)

Which of the following is likely to be the most effective therapy?

- 1- Furosemide
- 2- Salbutamol
- 3- Seretide
- 4- Tiotropium
- 5- Warfarin

Answer & Comments

Answer: 5- Warfarin

Given this woman's obesity, slowly progressive shortness of breath, absence of chest signs, and presence of peripheral oedema and varicose veins, chronic pulmonary emboli are the most likely possibility. As such warfarinisation is the optimal long term strategy to reduce the risk of further clots. She should also be encouraged to lose a significant amount of weight.

Salbutamol and Seretide are treatments for asthma and chronic obstructive pulmonary disease (COPD), and tiotropium is a treatment for COPD alone, therefore none of the three are appropriate here.

We are given no history of wheeze or cough which fits with either COPD or asthma as the underlying diagnosis.

Whilst furosemide may relieve peripheral oedema, it will not have a positive effect on the underlying cause of right heart failure.



[Q: 2965] OnExamination 2012 - Respiratory

A 43-year-old woman presents to the respiratory clinic with increasing shortness of breath and a dry cough. She also has fever and night sweats which have worsened over the

past six to nine months and has lost a few kg in weight.

On examination her BMI is 23, BP is 135/72 mmHg, pulse is 73, and there are scattered crackles on auscultation of the chest. She also has erythema nodosum on examination of both lower limbs.

Investigations show:

Haemoglobin 12.1 g/dl(11.5-16.0)

White cell count 9.1 x 10⁹/L (4-11)

Platelets 192 x 10⁹/L (150-400)

Sodium 137 mmol/l (135-146)

Potassium 4.2 mmol/l (3.5-5)

Creatinine 108 µmol/l (79-118)

pH 7.41(7.35-7.45)

pCO₂ 4.7 kPa(4.8-6.1)

pO₂ 9.8 kPa(10-13.3)

CXR - Bilateral hilar lymphadenopathy.

Which of the following is the most appropriate initial treatment?

- 1- Azathioprine
- 2- Hydroxychloroquine
- 3- Infliximab
- 4- Methotrexate
- 5- Prednisolone

Answer & Comments

Answer: 5- Prednisolone

This patient has sarcoidosis as evidenced by the hilar lymphadenopathy, erythema nodosum and mild hypoxia on blood gas analysis. Prednisolone is the mainstay of initial treatment for sarcoid, continued for 12 months or more in those patients who respond, but tapered to the minimal effective dose.

All of the other agents have been used in the management of sarcoidosis, although they are all subsidiary to use of corticosteroids.

Systematic reviews have not so far however supported the use of any particular second line agent.



[Q: 2966] OnExamination 2012 - Respiratory

A 21-year-old woman presents to the Emergency department with an hour history of chest tightness, dyspnoea, tingling in her hands and light-headedness. She has neither past medical history nor family history of note.

Examination is unremarkable aside from an elevated respiratory rate. Her pulse oximetry shows saturations of 96% on air, which do fall when she walks across the room. A chest x ray is also normal. An arterial blood gas sample (on air and at rest) is obtained and the results are as follows:

pH 7.52(7.36 - 7.44)

pCO₂ 2.2kPa(4.7 - 6.0)

pO₂ 9.1kPa(11.3 - 12.6)

HCO₃ 25 mmol/L(20 - 28)

What is the most likely diagnosis?

- 1- Acute asthma attack
- 2- Hyperventilation (psychogenic)
- 3- Pulmonary embolism
- 4- Respiratory muscle disease
- 5- Volume depletion

Answer & Comments

Answer: 3- Pulmonary embolism

This patient's blood gas sample shows respiratory alkalosis, as demonstrated by the raised pH, low pCO₂ and normal bicarbonate. Her pO₂ is over 8kPa, and she is therefore not technically in type 1 respiratory failure, but it is important to realise she is working hard to maintain this oxygenation. The most likely cause is an acute pulmonary embolism given the relative hypoxia, and saturation dropping on exertion. Given her age she may be taking

the oral contraceptive pill, which would be a risk factor.

In acute asthma the pCO₂ may be low, as the patient has an elevated respiratory rate, however in this instance there should be a history of the condition, clinical signs or a reduced pO₂.

Hyperventilation often demonstrates a respiratory alkalosis picture on analysis, however she should have a normal pO₂ and her saturations should not fall on exertion.

Respiratory muscle disease typically results in a respiratory acidosis.

Volume depletion (from a number of causes) would typically cause a metabolic alkalosis.



[Q: 2967] OnExamination 2012 - Respiratory

A 25-year-old man presented to the Emergency department with cough, shortness of breath and headache.

He had been treated by his GP with amoxicillin but did not improve. He had recently been on holiday in Spain.

On examination he had bilateral crackles. His liver enzymes were deranged.

Which antibiotic should be used?

- 1- Co-amoxiclav
- 2- Clarithromycin
- 3- Intravenous cefuroxime
- 4- Metronidazole
- 5- Oseltamivir (Tamiflu)

Answer & Comments

Answer: 2- Clarithromycin

Legionella pneumophila will respond to macrolides, quinolones and tetracyclines.

One should be careful to cover atypical pneumonia when choosing antibiotics.

Mortality can be high especially in the immunocompromised.

One should not wait for the results of culture or urinary antigens.



[Q: 2968] OnExamination 2012 - Respiratory

A patient's arterial blood gas analysis gives the following results:

pO₂ 10 kPa/75mmHg(11.3-12.6 kPa)

pCO₂ 7 kPa/52 mmHg(4.7-6.0 kPa)

pH 7.47(7.36-7.44)

Bicarbonate 37 mmol/L(20-28)

Which of the following is the most likely cause?

- 1- Acute exacerbation of chronic obstructive pulmonary disease
- 2- Chronic hyperventilation syndrome
- 3- Diabetic coma
- 4- Pulmonary embolism
- 5- Pyloric obstruction

Answer & Comments

Answer: 5- Pyloric obstruction

These results demonstrate a metabolic alkalosis and there is respiratory compensation with an elevation of pCO₂.

Consequently, pO₂ is slightly low.

The most probable cause is pyloric stenosis.



[Q: 2969] OnExamination 2012 - Respiratory

An 18-year-old woman presents with an acute pulmonary embolism in the ninth week of pregnancy.

What is the most appropriate treatment for this patient throughout her pregnancy?

- 1- Aspirin

- 2- Intravenous unfractionated heparin
- 3- Subcutaneous low molecular weight heparin (LMWH)
- 4- Subcutaneous unfractionated heparin
- 5- Warfarin

Answer & Comments

Answer: 3- Subcutaneous low molecular weight heparin (LMWH)

Anticoagulation with subcutaneous heparin is recommended in most guidelines with LMWH being a suitable alternative. The latter has the advantage of requiring no monitoring but is a less well established therapy in pregnancy.

She cannot be treated with intravenous (IV) heparin throughout her pregnancy and warfarin is also contra-indicated due to teratogenicity.

Aspirin provides no demonstrable prophylactic value for venous thromboembolism.

For further information please see the following link:

<http://www.rcog.org.uk/files/rcog-corp/GTG37aReducingRiskThrombosis.pdf>



[Q: 2970] OnExamination 2012 - Respiratory

A 27-year-old female with adult respiratory distress syndrome (ARDS) is ventilated on intensive care.

Her inspired oxygen is 100%, positive end expiratory pressure is 15 cmH₂O and peak airway pressure is 40 cmH₂O.

Her arterial blood gas shows:

paO₂ 6 kPa(11.3-12.6)

paCO₂ 6.9 kPa(4.7-6.0)

SpO₂ 88%(>92%)

What treatment has been shown to decrease mortality in this patient group?

- 1- High frequency oscillatory ventilation (HFOV)
- 2- Increasing tidal volume and respiratory rate on the ventilator
- 3- Inhaled nitric oxide therapy
- 4- Prone position
- 5- None

Answer & Comments

Answer: 5- None

This lady is on maximal ventilatory therapy but is still hypoxic.

Her high CO₂ is a reflection of permissive hypercapnia to prevent overdistension of the lungs with high tidal volumes.

None of the therapies above are proven to improve mortality. However proning a patient in this situation will improve ventilation/perfusion mismatch and temporarily improve oxygenation.

Some clinicians would move immediately to HFOV without proning as placing a patient face down is obviously fraught with difficulty.

Nitric oxide therapy to improve hypoxic pulmonary vasoconstriction is used infrequently.



[Q: 2971] OnExamination 2012 - Respiratory

A 26-year-old man with a history of alcohol and drug abuse was admitted with a 14 day history of fever, cough and fatigue.

He was emaciated. His temperature was 39.4 C. Cervical and axillary lymphadenopathy were present. Chest x ray revealed bilateral areas of pulmonary shadowing.

Which of the following is the most likely diagnosis?

- 1- Alcoholic cardiomyopathy
- 2- Pneumococcal pneumonia

- 3- Pneumocystis pneumonia
- 4- Pulmonary tuberculosis
- 5- Tricuspid endocarditis

Answer & Comments

Answer: 3- Pneumocystis pneumonia

This is a tricky question. It is leading you to consider a diagnosis of HIV in this gentleman, and subsequent opportunistic infections. His clinical presentation fits best with a diagnosis of *Pneumocystis jirovecii*.

Pneumocystis jirovecii is a eukaryotic microorganism. In immunosuppressed patients it can cause a pneumonia, which is most recognised in patients with AIDS but can also be seen in those with organ transplants or when undergoing chemotherapy. A CD4 count of less than 200 is associated with significant risk. In Europe, the USA and Australia *P. jirovecii* pneumonia in HIV-positive patients is seen largely in those unaware of their HIV status. Unfortunately it is a major cause of death in Africa, especially in children. Previously it was thought that disease was caused by reactivation of latent infection acquired in childhood, but *de novo* infection is increasingly recognised.

The pneumonia caused by *P. jirovecii* is potentially severe and fatal in immunosuppressed patients. Clinically it presents with several weeks' history of dry cough, fever and dyspnoea. Examination findings are often subtle, but include tachypnoea, tachycardia, cyanosis and fine respiratory crackles. Typically, patients desaturate markedly on exertion. There may be reduced transfer factor, vital capacity and total lung capacity on spirometry. Bronchoalveolar lavage or induced sputum can be used to demonstrate the organism (open lung biopsy is gold standard, but rarely performed in clinical practice). Giemsa, Papanicolaou and Grocott's stains are used.

There are a variety of different chest radiograph findings. Typically it causes bilateral symmetrical perihilar reticular or granular interstitial shadowing. Less often there can be asymmetric shadowing, or progression to a reticular-alveolar pattern. Occasionally lobar consolidation, nodular lesions, prominent pulmonary arteries, pneumothorax, pneumomediastinum, cysts or pneumatoceles can be seen. In patients who have been on prophylactic inhaled pentamidine the infiltrates may predominantly affect the upper lobes. A normal chest x-ray does not exclude the diagnosis. Pleural effusions and lymphadenopathy are not typical, but be aware of the possibility of multiple disease processes in an immunosuppressed patient.

If allowed to progress, *P. jiroveci* can disseminate via the lymphatic and haematogenous routes to affect the thyroid, liver, bone marrow, lymph nodes and spleen.

If PCP is suspected, treatment with full dose co-trimoxazole should be started as soon as possible. It should be given for 21 days in HIV-positive cases, but shorter doses can be used in other causes of immunosuppression. In patients who are intolerant or co-trimoxazole, intravenous pentamidine can be used. Some studies have shown that that corticosteroids can reduce the risk of respiratory failure, and they are therefore used in some cases.

Prophylaxis should be used in immunosuppressed patients who are at risk of developing PCP: all those with a CD4 count of <200, patients started on high dose steroids, and those on chemotherapeutic regimens associated with significant immunosuppression. Co-trimoxazole is also the first line prophylactic agent.

Tuberculosis is another possible diagnosis, but would likely be miliary given the lymphadenopathy and respiratory symptoms. This usually presents with a more insidious onset, and the radiographic findings generally

take a few weeks to develop. The incidence is dependent on the patient's exposure to TB, and it is therefore more common in patients who originate from areas of high prevalence.

Tricuspid endocarditis is definitely a possibility in an intravenous drug user presenting with these symptoms. Bilateral areas of pulmonary shadowing are possible due to septic emboli, but you may expect the question to report a murmur heart on auscultation.

Pneumococcal pneumonia typically has a shorter history than this, and bilateral disease is unusual.

Alcoholic cardiomyopathy presents with signs and symptoms of congestive cardiac failure, not those described here.



[Q: 2972] OnExamination 2012 - Respiratory

Which of the following is found in subjects acclimatised to life at high altitudes?

- 1- Increased mean corpuscular haemoglobin concentration
- 2- Increased pulmonary artery pressure
- 3- Periodic respiration
- 4- Increased airway resistance
- 5- Reduced cardiac output

Answer & Comments

Answer: 2- Increased pulmonary artery pressure

This is a discriminating question.

Acclimatisation results in increased Hb with erythrocytosis.

Periodic respiration is a feature of non-acclimatisation.

Respiration is normal when subjects are acclimatised to altitude as is cardiac output.

Pulmonary artery pressure increases in an effort to oxygenate more blood.

2,3-DPG increases.

Here's a good read from Adaptation to Altitude.



[Q: 2973] OnExamination 2012 - Respiratory

Sleep apnoea syndrome is best diagnosed by which the following?

- 1- Blood gases during apnoeic episodes
- 2- EEG
- 3- Polygraphic sleep studies
- 4- Presence of HLA-DR2 and DQw1
- 5- Therapeutic trial of amphetamines

Answer & Comments

Answer: 3- Polygraphic sleep studies

Sleep apnoea is characterised by cessation of breathing during sleep.

This causes extreme restlessness with frequent respiratory pauses during night sleep. Consequently, patients report daytime drowsiness and irritability.

It is associated with snoring.

The diagnosis is established by polygraphic recording of sleep which shows periods (at least 30 of 10 or more seconds duration in seven hours of sleep) of apnoea, associated with a fall in arterial oxygen saturation.



[Q: 2974] OnExamination 2012 - Respiratory

A 55-year-old man presents with ataxia and bilateral gynaecomastia.

Which of the following is the most likely diagnosis?

- 1- Bronchial carcinoma
- 2- Hypereosinophilic syndrome
- 3- Klinefelter's syndrome

4- Long term treatment with cyclophosphamide for Wegener's granulomatosis

5- Long term treatment with oral steroids for chronic asthma

Answer & Comments

Answer: 1- Bronchial carcinoma

Klinefelter's and lung cancer are causes of gynaecomastia but the combination of ataxia and gynaecomastia makes it far more likely to be lung cancer.

Gynaecomastia is a non-metastatic paraneoplastic syndrome usually due to non-small cell lung cancer.

It can be painful and may be associated with testicular atrophy.

Ataxia can occur as a result of a paraneoplastic cerebellar degeneration associated with the malignancy.



[Q: 2975] OnExamination 2012 - Respiratory

A 27-year-old woman with a known history of asthma who lives in the countryside comes to the clinic for review.

She has progressively worsening disease and is currently taking high dose Seretide and montelukast. Apparently she coughs every night, occasionally with frank haemoptysis and is finding it impossible to do any regular exercise at all.

On examination her BP is 128/82 mmHg, pulse is 74 and regular. There is extensive wheeze and scattered coarse crackles on auscultation of the chest. Her peak flow is 320 (580 predicted).

Investigations show:

Haemoglobin 12.7 g/dl(11.5-16.0)

White cell count $7.9 \times 10^9/L$ (4-11)

Eosinophil count $1.2 \times 10^9/L$ (0.04-0.4)

Platelets $173 \times 10^9/L$ (150-400)

Sodium 137 mmol/l (135-146)

Potassium 4.2 mmol/l (3.5-5)

Creatinine 98 micromol/l (79-118)

Which of the following is the best investigation?

- 1- Aspergillus precipitins
- 2- CT thorax
- 3- CXR
- 4- IgE
- 5- Sputum culture

Answer & Comments

Answer: 1- Aspergillus precipitins

The most likely diagnosis here is allergic bronchopulmonary aspergillosis (ABPA); as such aspergillus precipitins can contribute significantly to confirming the diagnosis.

Oral steroids are the mainstay of initial treatment and anti-fungals such as itraconazole may also improve resolution of symptoms in some cases.

Whilst both chest x ray and CT thorax may show evidence of infiltrates this is relatively non-specific and therefore would not be optimal investigations; they may, however, prove useful in assessing severity of disease.

IgE is elevated in ABPA but is not as specific an investigation as aspergillus precipitins.

Sputum culture may be positive but negative culture would not exclude the disease.



[Q: 2976] OnExamination 2012 - Respiratory

A patient presents to chest clinic with an eight month history of cough and progressive breathlessness.

Simple spirometry is performed and the results are below:

FEV 11.2L (54% predicted)

FVC 2.3L (61% predicted)

FEV₁/ FVC 0.79

Which of the below conditions are associated with this lung function picture?

- 1- Bronchiectasis
- 2- Emphysema
- 3- Obesity
- 4- Obliterative bronchiolitis
- 5- Simple coal worker's pneumoconiosis

Answer & Comments

Answer: 3- Obesity

This patient has a restrictive lung defect (FEV₁/FVC >0.7). Obesity is a well recognised cause of restrictive lung defects. It is associated with hypoventilation and as a result can cause hypercapnia.

Patient's with simple coal worker's pneumoconiosis do not show significant abnormalities on pulmonary function tests. The other conditions listed all cause an obstructive result (FEV₁/FVC <0.7).



[Q: 2977] OnExamination 2012 - Respiratory

A 22-year-old woman comes to the clinic with tiredness and shortness of breath. She is 30 weeks pregnant. The pregnancy has been uneventful so far.

On examination her BP is 122/72 mmHg, pulse is 75 and regular, saturations are 95% on air.

Respiratory, cardiovascular and abdominal examinations are unremarkable, her BMI is 24.

Investigations show:

Haemoglobin 9.5 g/dl(11.5-16.0)

White cell count $8.0 \times 10^9/L$ (4-11)

Platelets $200 \times 10^9/L$ (150-400)

Sodium 137 mmol/l (135-146)

Potassium 4.1 mmol/l (3.5-5)

Creatinine 90 µmol/l (79-118)

Which of the following is the next most appropriate investigation?

- 1- B12
- 2- Faecal occult bloods
- 3- Ferritin
- 4- Folate
- 5- Upper GI endoscopy

Answer & Comments

Answer: 3- Ferritin

Ferritin is the most important first investigation, so is the only correct answer.

The most likely explanation is pregnancy related iron deficiency, so with respect to further investigations, faecal occult bloods and upper GI endoscopy are unnecessary.

The need for folate supplements should of course also be reinforced during the consultation.



[Q: 2978] OnExamination 2012 - Respiratory

You are an SHO working in the Emergency department when a 67-year-old gentleman with known COPD attends via ambulance.

He has a short history of increasing breathlessness. He denies a productive cough. On arrival he is dyspnoeic with a respiratory rate of 33. Other observations are as follows saturations 88% on 28% O₂, HR 105 bpm, BP 118/86 mmHg, temperature 36.9C.

On examination he has a widespread polyphonic wheeze. A blood gas 45 minutes after arrival and following initial treatment is performed, results are as below.

pH 7.24 (7.36 - 7.44)

pCO₂ 8.8 (4.7 - 6.0 kPa)

pO₂ 8.4 (11.3 - 12.6 kPa)

What should your management be?

- 1- Call ITU for consideration on invasive ventilation
- 2- Continue controlled oxygen and repeated nebuliser therapy - repeat gas in 45 minutes
- 3- Continue controlled oxygen, nebulised therapy and IV antibiotics (repeat gas in 45 minutes)
- 4- Start non-invasive ventilation (NIV) on settings 10 IPAP and 4 EPAP
- 5- Start non-invasive ventilation (NIV) on settings 14 IPAP and 4 EPAP

Answer & Comments

Answer: 1- Call ITU for consideration on invasive ventilation

This patient has an exacerbation of COPD, defined as sustained worsening of the patient's symptoms which is acute in onset. This may include worsening breathlessness, cough, increased sputum and change in sputum colour. The diagnosis is usually made clinically. Supporting investigations include a chest radiograph, arterial blood gases, ECG, routine bloods and sputum and blood cultures.

Treatment is with bronchodilators, nebulised in the majority of patients. If a patient is hypercapnic or acidotic, as in this case, these should be driven by compressed air. If oxygen therapy is needed it should be administered simultaneously by nasal cannulae.

Oxygen should be given to maintain SaO₂ within the patient's individual target range, if available (COPD patients are being given cards with this information, so always ask). ABGs should be repeated at regular intervals to monitor response to treatment, and oxygen weaned when available.

Oral corticosteroids should also be given: 30mg prednisolone for 7-14 days. Prolonged courses offer no additional benefit.

Antibiotics should be used to treat exacerbations associated with more purulent sputum, consolidation on chest radiograph, or clinical signs of pneumonia. Empirical antibiotic choice should be guided by local policy, and altered to take account of any subsequent culture results.

Non-invasive ventilation (NIV) is the treatment of choice for persistent hypercapnic ventilation failure despite optimal medical therapy. It has been shown in RCTs to reduce intubation rate and mortality in COPD patients with decompensated respiratory acidosis (pH <7.35 and pCO₂ >6kPa). NIV should therefore be considered within the first 60 minutes of hospital arrival in all patients with an acute exacerbation of COPD in whom a respiratory acidosis persists despite maximal medical therapy (controlled oxygen, nebulised salbutamol and ipratropium, prednisolone, antibiotic (where indicated)). Exceptions may be: life threatening hypoxaemia (when invasive ventilation may be more appropriate), severe co-morbidity, severe cognitive impairment (where NIV is not tolerated), facial burns/trauma/surgery, vomiting, fixed upper airway obstruction, undrained pneumothorax, upper GI surgery, unprotected airway, copious respiratory secretions, haemodynamic instability requiring inotropes.

Patients should be sitting or semi-recumbant, and a full-face mask used initially. An initial inspiratory positive airway pressure (IPAP) of 10cm H₂O and expiratory positive airway pressure (EPAP) of 4-5cm H₂O should be used. IPAP should be increased by 2-5cm increments every 10 minutes, with a usual target of 20cm H₂O or until a therapeutic response is achieved. Oxygen can be introduced into the circuit, usually with a target saturation of 88-92%. Bronchodilators are preferably administered off NIV. Patients should be closely monitored, including ABG, respiratory rate and heart rate. ABGs should be repeated after 1 hour of NIV therapy, and 1 hour after

subsequent change in settings or 4 hours in stable patients.

All non-invasive ventilation services should have their own local protocol based on these guidelines. There should be a clear plan of what to do in the event of deterioration.

Patients with a pH <7.26 should be managed with a low threshold for intubation, and this should be considered in this case. Functional status, BMI, requirement for oxygen when stable, comorbidities and previous admissions should be considered in addition to age and FEV₁ when assessing suitability. Whilst in clinical practice you would give NIV whilst awaiting consideration from intensive care, it is important to consider intubation in this patient who is failing to improve and remains persistently severely acidotic.

Intravenous theophylline should be used only if there is an inadequate response to nebulised bronchodilators. Levels should be closely monitored.

Respiratory stimulants are only indicated when NIV is inappropriate, and their use supervised by a specialist physician.

There is no indication from the information provided that this is an infective exacerbation so the use of antibiotics at this time is not indicated.



[Q: 2979] OnExamination 2012 - Respiratory

A 25-year-old man presented to the Emergency Department with cough, shortness of breath and headache.

He had been treated by his GP with amoxicillin but did not improve. He had recently been on holiday in Spain.

On examination he had bilateral crackles. His liver enzymes were deranged.

What would be the most useful diagnostic test?

- 1- Chest x ray
- 2- O₂ saturation at rest and on exertion
- 3- Viral serology
- 4- White cell count
- 5- Urinary antigen

Answer & Comments

Answer: 5- Urinary antigen

Legionella pneumonia is spread via aerosols.

It occurs in 2-15% of community acquired pneumonia. It should be suspected in case of foreign travel or stay in hotels, failure to respond to penicillins, diarrhoea accompanying respiratory symptoms, deranged liver function tests and low sodium.

The diagnostic test is urinary antigen. One should not wait for the result. Sputum cultures (if productive) are also diagnostic.

O₂ saturation at rest and desaturation after exertion will help in Pneumocystis carinii pneumonia (PCP).

Chest x ray may show unilateral or bilateral lobar pneumonia and there may be small pleural effusions but this is not diagnostic.

WCC may be high or low.



[Q: 2980] OnExamination 2012 - Respiratory

A 60-year-old man is admitted with a productive cough with flecks of blood in his sputum.

Chest x ray reveals a mass lesion in the right mid zone.

Investigations reveal:

Sodium 110 mmol/L(137-144)

Potassium 4.0 mmol/L(3.5-4.9)

Bicarbonate 24 mmol/L(20-28)

Urea 3.0 mmol/L(2.5-7.5)

Creatinine 80 µmol/L(60-110)

Which of the following findings suggest a diagnosis of the syndrome of inappropriate ADH (SIADH) secretion?

- 1- Plasma osmolality 236 mosmol/kg (278-305)
- 2- Presence of ascites
- 3- Urine flow rate 20 mL/hour
- 4- Urine osmolality 250 mosmol/kg (350-1000)
- 5- Urine sodium 110 mmol/L

Answer & Comments

Answer: 5- Urine sodium 110 mmol/L

The serum osmolality associated with hyponatraemia is generally low and so would not in itself suggest SIADH.

However, in the context of the low plasma osmolality a high urine osmolality (2x that of the plasma osmolality) with an elevated urine sodium (above 20 mmol/L) is suggestive of this diagnosis.



[Q: 2981] OnExamination 2012 - Respiratory

A 62-year-old woman presents with stridor associated with a retrosternal goitre.

What is the most appropriate investigation of her airways obstruction?

- 1- FEV₁/FVC ratio
- 2- Flow volume loop
- 3- Peak expiratory flow rate
- 4- Spirometry
- 5- Transfer factor

Answer & Comments

Answer: 2- Flow volume loop

The flow volume loop is the best method of detecting an obstruction associated with a retrosternal mass.

See an example of a flow volume loop of large airway obstruction.



[Q: 2982] OnExamination 2012 - Respiratory

A 60-year-old man presents with inspiratory stridor with a chest x ray revealing compression of the trachea by a retrosternal goitre.

Which of the following investigations is the most useful to assess the severity of his airways obstruction?

- 1- Flow/volume loop
- 2- Forced expiratory volume
- 3- Forced vital capacity
- 4- Peak expiratory flow rate
- 5- Residual volume

Answer & Comments

Answer: 1- Flow/volume loop

A flow volume loop is the most appropriate investigation to assess severity of the obstruction.



[Q: 2983] OnExamination 2012 - Respiratory

A 65-year-old woman, a heavy smoker for many years, has had worsening dyspnoea for the past five years, without a significant cough.

A chest x ray shows increased lung size along with flattening of the diaphragm, consistent with emphysema. Over the next several years she develops worsening peripheral oedema. Her BP is 115/70 mmHg.

Which of the following cardiac findings is most likely to be present?

- 1- Constrictive pericarditis
- 2- Left ventricular aneurysm
- 3- Mitral valve stenosis

- 4- Non-bacterial thrombotic endocarditis
- 5- Right ventricular hypertrophy

Answer & Comments

Answer: 5- Right ventricular hypertrophy

This lady has chronic obstructive airways disease and subsequent cor pulmonale leading to right heart failure.

Non-bacterial thrombotic endocarditis is a condition seen in frail ill individuals.



[Q: 2984] OnExamination 2012 - Respiratory

A 47-year-old woman presenting with breathlessness has arterial blood gases taken which give the following results:

pO₂ 8.7 kPa/65mmHg (11.3-12.6)

pCO₂ 4.4 kPa/33mmHg (4.7-6.0)

pH 7.46 (7.36-7.44)

HCO₃ 24 mmol/L (20-28)

Which of the following is the most likely diagnosis?

- 1- Acute severe asthma
- 2- Emphysema
- 3- Hyperventilation syndrome
- 4- Kyphoscoliosis
- 5- Opiate overdose

Answer & Comments

Answer: 1- Acute severe asthma

The patient has an acute respiratory alkalosis with associated hypoxia. This is consistent with an acute asthmatic attack.

A normal or rising CO₂ is an ominous sign indicative of a life-threatening attack and the need to consider ventilatory support.

Patients with hyperventilation syndrome do show a respiratory alkalosis but this is not associated with hypoxia.



[Q: 2985] OnExamination 2012 - Respiratory

Which of the following is not true with regard to the radiological appearance of a chest x ray?

- 1- Consolidation of the left lower lobe will elevate the left hemidiaphragm
- 2- Consolidation of the lingular lobe will obliterate the aortic knuckle and pulmonary trunk in the PA view
- 3- Consolidation of the right anterior segment of the right middle lobe will extend to the right transverse fissure and the right hilum in PA view
- 4- Consolidation of the right apical segment will extend to the horizontal fissure in the PA view
- 5- Consolidation of the right middle lobe will obliterate the right atrial shadow in the PA view

Answer & Comments

Answer: 1- Consolidation of the left lower lobe will elevate the left hemidiaphragm

Consolidation in the left lower lobe obliterates the diaphragm whilst lingular consolidation will obliterate the left heart border.

The oblique fissure runs obliquely at 45 degrees from T4 or 5 vertebrae to the anterior costophrenic angle on lateral chest film.

The horizontal fissure runs from the hilum anteriorly to anterior chest wall.

The area above the horizontal fissure is the upper lobe, below the horizontal fissure is the middle lobe and below the oblique fissure is the lower lobe.



[Q: 2986] OnExamination 2012 - Respiratory

A 65-year-old man presents to the clinic with progressively increasing shortness of breath over the past three years. He is a non-smoker and worked until retirement in a bank office. There is no past medical history of note.

On examination he is clubbed, his BP is 142/72 mmHg, pulse is 73 and regular. There are widespread bilateral inspiratory crackles on auscultation. Chest x ray reveals a honeycomb appearance.

You suspect cryptogenic fibrosing alveolitis.

What is the chance of this being responsive to corticosteroids?

- 1- 1 in 50
- 2- 1 in 20
- 3- 1 in 10
- 4- 1 in 5
- 5- 1 in 2

Answer & Comments

Answer: 4- 1 in 5

Unfortunately responsiveness to corticosteroids in cryptogenic fibrosing alveolitis although up to 20% may show some objective response with respect to stabilisation of lung function.

Whilst only 20% of patients may be steroid responsive, other treatments for alveolitis include azathioprine and cyclophosphamide.

Other options under clinical trials include interferon-gamma 1beta and bosentan.



[Q: 2987] OnExamination 2012 - Respiratory

A 67-year-old man with known COPD attends the emergency department via ambulance with a severe exacerbation.

On arrival the ambulance crew hand over the oxygen alert card provided to him by his local chest clinic.

Which of the following pieces of information is listed on the standardised oxygen alert cards?

- 1- His previous oxygen saturations (when well)
- 2- His previous pCO₂ reading (when well)
- 3- His previous pO₂ reading (when well)
- 4- The oxygen concentration via venturi mask to be used
- 5- Underlying respiratory condition

Answer & Comments

Answer: 4- The oxygen concentration via venturi mask to be used

The British Thoracic Society in conjunction with the Intensive Care Society has produced oxygen alert cards that can be downloaded and printed to give to patients.

The details provided include the patient's name, that they are at risk of type II respiratory failure (with raised CO₂ levels), the concentration of oxygen to be delivered via venturi mask and their target oxygen saturations.

It also contains advice regarding the use of air and oxygen driven nebuliser machines in such patients.

The early identification of at risk patients is essential in avoiding over-oxygenation and precipitating CO₂ retention.



[Q: 2988] OnExamination 2012 - Respiratory

A 65-year-old man is admitted from home with a community-acquired pneumonia (CAP).

He has a history of skin rash to penicillin documented in his medical notes. He has adverse prognostic features and a CURB score of 4.

What would be an appropriate empirical antibiotic choice?

- 1- Augmentin
- 2- Augmentin and gentamycin
- 3- Cefotaxime and erythromycin
- 4- Cefuroxime and metronidazole
- 5- Ciprofloxacin and clarithromycin

Answer & Comments

Answer: 3- Cefotaxime and erythromycin

Community-acquired pneumonia is most commonly caused by Strep. pneumoniae, hence the use of a beta-lactam antibiotic because of the increased incidence of atypical organisms such as Mycoplasma. A macrolide such as erythromycin is also recommended.

Augmentin is contraindicated as it is penicillin-based.

Ciprofloxacin has poor cover against Strep. pneumoniae and metronidazole is used for anaerobic infections.

In this case a credible alternative for beta-lactam sensitivity is not mentioned and the best choice, because of clinical necessity since severe pneumonia can be fatal if treated with antibiotics that are not effective, is to go with the only cephalosporin and macrolide combination that is offered.

The chance of cross reactivity of penicillin allergy with beta-lactams is only 10%. A rash is not a contraindication for this.

If the patient has a documented anaphylactic reaction specifically to penicillin then this case would need to be discussed between the medical and microbiology consultants before the prescription was given. Different trusts have different policies regarding this and consequently it is highly unlikely you will be tested on this.



[Q: 2989] OnExamination 2012 -

Respiratory

65-year-old man came to the hospital for worsening breathlessness. He was a chronic smoker and previously diagnosed with lung cancer.

Chest x ray revealed elevation of left hemidiaphragm and left phrenic nerve palsy was suspected.

Which of the following findings on fluoroscopy of diaphragm will confirm the diagnosis?

- 1- No movement of the left hemidiaphragm
- 2- No movement of the right hemidiaphragm
- 3- Normal movement of both hemidiaphragms
- 4- Paradoxical movement of the left hemidiaphragm
- 5- Paradoxical movement of the right hemidiaphragm

Answer & Comments

Answer: 4- Paradoxical movement of the left hemidiaphragm

The diagnosis of phrenic nerve palsy is suspected when on the chest radiograph the diaphragmatic leaflet is elevated and is confirmed fluoroscopically by observing paradoxical diaphragmatic motion on sniff and cough.

In patients with normal lungs unilateral paralysis is usually asymptomatic and rarely requires treatment.



[Q: 2990] OnExamination 2012 - Respiratory

A 64-year-old man presented with shortness of breath. On examination he had the signs of a large right-sided pleural effusion.

Investigations revealed:

Pleural fluid analysis: protein 48 g/L

What is the most likely cause?

- 1- Cardiac failure

- 2- Constrictive pericarditis

- 3- Hepatic cirrhosis

- 4- Mesothelioma

- 5- Nephrotic syndrome

Answer & Comments

Answer: 4- Mesothelioma

The high protein content of the effusion suggests that it is an exudate.

Mesothelioma is the only cause of an exudate in this list.

The remaining choices cause a transudative effusion.



[Q: 2991] OnExamination 2012 - Respiratory

A 19-year-old intravenous drug user presents to the emergency department with a fever of 38.5°C, dyspnoea, and right sided pleuritic chest pain.

Bilateral cavitating lesions are seen in both lungs on his chest x ray.

What is the most likely diagnosis?

- 1- Aspiration pneumonia
- 2- Endocarditis of the tricuspid valve
- 3- Pneumocystis carinii pneumonia (PCP)
- 4- Pulmonary embolic disease
- 5- Pulmonary tuberculosis

Answer & Comments

Answer: 2- Endocarditis of the tricuspid valve

PCP can be excluded as it does not present in this manner.

Aspiration pneumonia is more likely to show a single abscess cavity rather than multiple bilateral lesions.

The patient is certainly at higher risk of TB and this is difficult to exclude without additional

information regarding constitutional symptoms (weight loss, night sweats, etc).

The remaining two choices are somewhat unfair since pulmonary emboli could clearly arise from tricuspid endocarditis due to dislodged vegetations. However, an argument might be made that PEs arising from venous thromboemboli do not typically cavitate.

The best answer, therefore, is that these cavities are due to septic emboli arising from infection on the tricuspid valve. Systemic embolisation occurs in 20-50% of cases of infective endocarditis, and can involve the lungs, central nervous system, coronary arteries, spleen, bowel and extremities. This highest incidence of emboli is seen with aortic and mitral valve infections, due to *S. aureus*, *Candida*, *HACEK* and *Abiotrophia*. Most occur within the first 2-4 weeks of therapy.



[Q: 2992] OnExamination 2012 - Respiratory

A 68-year-old male is admitted with a two month history of difficulty raising his arms, ascending stairs, and is also aware of a dry mouth. He smokes 15 cigarettes daily and admits to heavy alcohol consumption.

On examination he has proximal weakness affecting all four limbs with absent tendon reflexes. His chest x ray shows a right pleural effusion.

What is the most likely diagnosis?

- 1- Alcohol induced myopathy
- 2- Eaton-Lambert syndrome
- 3- Myasthenia gravis
- 4- Polymyalgia rheumatica
- 5- Polymyositis

Answer & Comments

Answer: 2- Eaton-Lambert syndrome

Eaton-Lambert syndrome is characterised by

Proximal muscle weakness (the cranial nerves and respiratory muscles are usually spared)

Depressed or absent tendon reflexes and

Autonomic features (for example, dry mouth, impotence, etc).

Seventy percent of cases are due to small cell lung cancer.

Unlike myasthenia gravis exercise is associated with increasing muscle strength and there is a negative response to Tensilon. Electromyography is useful in confirming the diagnosis where repeated nerve stimulations cause a progressive increase in the size of the muscle action potential.

Eaton (1905-1958) U.S. neurologist at Mayo Clinic. Lambert (1915-2003) U.S neuro-physiologist at Mayo Clinic and Prof. of physiology at University of Minnesota.



[Q: 2993] OnExamination 2012 - Respiratory

In the normal lung which of the following is correct?

- 1- Cartilage is present in all respiratory bronchioles.
- 2- The majority of airway resistance is generated by small airways.
- 3- There is an intrapleural pressure of 30 cmH₂O (3kPa) at the end of normal expiration.
- 4- There is a resting pulmonary blood flow of 10L/min.
- 5- The V:Q ratio is greater in apical than basal segments of the lung when upright and at rest.

Answer & Comments

Answer: 5- The V:Q ratio is greater in apical than basal segments of the lung when upright and at rest.

Because of surfactant, the pressure difference across the pleura required to inflate the lungs, is usually no more than about 4cmH₂O.

Resting pulmonary blood flow in an adult is around 5L/min.

Gas rises, so the V:Q ratio is higher in the apical than the basal segments.

While a single small airway provides more resistance than a single large airway, resistance to air flow depends on the number of parallel pathways present. For this reason, the large and particularly the medium-sized airways actually provide greater resistance to flow than do the more numerous small airways.

Cartilage disappears in the terminal bronchioles.



[Q: 2994] OnExamination 2012 - Respiratory

In asbestos related disorders which of the following statements is correct?

- 1- Basal fibrotic shadowing on CXR suggests coincidental idiopathic fibrosing alveolitis
- 2- Increased incidence of primary lung cancer
- 3- Pleural effusion develops more than 20 years after causative asbestos exposure
- 4- Pleural plaques are recognised precursors of mesothelioma
- 5- The risk of malignant mesothelioma is greatly increased in smokers compared with non-smokers

Answer & Comments

Answer: 2- Increased incidence of primary lung cancer

The risk of mesothelioma is not affected by smoking but smoking and asbestos exposure greatly increase the risk of lung cancer.

It is pleural plaques which do not become apparent until 20 years or more after exposure.

Pleural effusions may result from acute asbestosis pleurisy.

Pleural plaques are not precursors of malignant change, but they reflect previous asbestos exposure.

Basal fibrotic changes suggest the presence of asbestosis as the fibres are fibrogenic.



[Q: 2995] OnExamination 2012 - Respiratory

A 17-year-old female presents with acute breathlessness. She has had asthma for approximately three years and recently commenced new therapy.

Which agent may be responsible for this exacerbation?

- 1- Beclomethasone
- 2- Ipratropium bromide
- 3- Montelukast
- 4- Salmeterol
- 5- Theophylline

Answer & Comments

Answer: 4- Salmeterol

Salmeterol has been reported to produce an acute exacerbation of asthma, possibly through an acute hypersensitivity reaction.



[Q: 2996] OnExamination 2012 - Respiratory

A 65-year-old man, with a history of smoking presents with chronic cough, haemoptysis and weight loss. His chest x ray shows a cavitating lesion.

What is the likely diagnosis?

- 1- Adenocarcinoma
- 2- Alveolar cell carcinoma

- 3- Undifferentiated large cell carcinoma
- 4- Small cell carcinoma
- 5- Squamous cell carcinoma

Answer & Comments

Answer: 5- Squamous cell carcinoma

The combination of cough, haemoptysis and weight loss in a smoker should lead you to consider lung carcinoma as a possible diagnosis. A lifelong smoker has a 20 to 30 times increased risk of smoking compared to a non-smoker. Haemoptysis in particular is one of the common presenting symptoms of carcinoma.

The two major forms of lung carcinoma are non-small cell lung carcinoma (85%) and small cell lung carcinoma (15%). Non-small cell lung carcinomas are further divided into squamous cell (35%), adenocarcinoma (30%), undifferentiated large cell (10%) and bronchial-alveolar cell (5%). Squamous cell carcinomas usually arise from a central airway, and cavitate. Small cell carcinomas arise in the central airways and grow rapidly. Adenocarcinomas may be peripheral and slow-growing; they are the commonest lung carcinomas in non-smokers. Smoking is associated with all forms but is most strongly linked with small-cell and squamous cell carcinoma.

Other causes of cavitating lung lesions include:

Infection (Staphylococcus aureus, tuberculosis, Klebsiella, Pneumocystis jiroveci)

Pulmonary infarcts

Wegener's granulomatosis

Rheumatoid nodules.



[Q: 2997] OnExamination 2012 - Respiratory

A 23-year-old woman attends the clinic for asthma review.

She remains significantly short of breath and has wheeze and coughing in the early hours of the morning. At her last appointment you instigated treatment with salmeterol as she was already on a stable dose of 400 mcg per day inhaled beclomethasone.

On examination in the clinic her BP is 100/70 mmHg, her pulse is 70 and regular. She has scattered wheeze on auscultation of the chest and her PEF is 380 (predicted 550). This is similar to prior to starting the salmeterol from which she perceives she has gained no benefit.

According to asthma guidelines which of the following is the most appropriate next step?

- 1- Add low dose oral steroids
- 2- Add montelukast
- 3- Add theophylline
- 4- Increase inhaled corticosteroid to 800 mcg/day
- 5- Stop salmeterol and increase inhaled corticosteroid to 800 mcg/day

Answer & Comments

Answer: 5- Stop salmeterol and increase inhaled corticosteroid to 800 mcg/day

2011 BTS guidelines suggest that if the patient has not, as in this case, derived benefit from the LABA then it should be stopped and inhaled corticosteroid increased. Only in the circumstance that there has been some benefit derived should it be continued with increase in the corticosteroids.

Montelukast and theophylline are considered after the dose of inhaled corticosteroids has been maximised according to the asthma guidelines.

Given asthma is a chronic condition low dose oral steroids are considered a treatment of last resort at step 5.



[Q: 2998] OnExamination 2012 - Respiratory

A 45-year-old man presents with a three month history of wheezing and dyspnoea whilst at work. His symptoms improve significantly when at home and at weekends.

What is the likely causative agent?

- 1- Asbestos
- 2- Cotton dust
- 3- Isocyanates
- 4- Silica
- 5- Simple coal worker's lung

Answer & Comments

Answer: 3- Isocyanates

This patient presents with typical symptoms of occupational asthma and the most likely causative substance is isocyanate which is used in the manufacture of foams/plastics.

There are an estimated 1500 to 3000 cases of occupational asthma reported each year.

Other implicated substances include flour dust, wood dust, latex, solder and glues.



[Q: 2999] OnExamination 2012 - Respiratory

A 44-year-old man with advanced HIV/AIDS presents with a two week history of fever, weight loss (8 kg) and sweats. His latest CD4 T-lymphocyte count (taken four weeks previously) was 20 cells/mm³. He had failed multiple regimens of antiretroviral therapy and was not currently taking any prescribed medications other than co-trimoxazole as prophylaxis against *Pneumocystis carinii* pneumonia.

Investigations:

Hb 8.2 g/dL (13.0-18.0)

Total WBC $2.1 \times 10^9/L$ (4-11)

Platelets $75 \times 10^9/L$ (150-400)

A bone marrow aspirate showed acid/alcohol fast bacilli on light microscopy.

Which one of the following mycobacteria is the most likely cause of his presenting illness?

- 1- *Mycobacterium avium*
- 2- *Mycobacterium bovis*
- 3- *Mycobacterium chelonae*
- 4- *Mycobacterium fortuitum*
- 5- *Mycobacterium marinum*

Answer & Comments

Answer: 1- *Mycobacterium avium*

Mycobacterium bovis and *Mycobacterium tuberculosis* are classified as 'typical' mycobacteria that cause a similar spectrum of disease.

As its name suggests, *M. bovis* also causes disease in cattle and the usual source of human infection was from drinking contaminated milk; this is now rare.

BCG is a live attenuated vaccine derived from a strain of *M. bovis*. BCG is currently used as a form of immunotherapy for treating bladder cancer; several cases of disseminated *M. bovis* infection (systemic 'BCG-it is') have been described as a result of systemic infection following this treatment.

The other organisms listed are non-tuberculous mycobacteria (NTM); sometimes referred to as 'atypical' mycobacteria. They differ from *M. tuberculosis* in that they are ubiquitous organisms and have no person-to-person spread.

Mycobacterium avium (also known as *Mycobacterium avium* complex [MAC], or *Mycobacterium avium* intracellulare [MAI]) causes disseminated infection in patients with advanced HIV, typically when the CD4 count is less than 50 cells/mm³.

This is a disseminated infection that usually causes symptoms of fatigue, weight loss and

fevers. Bone marrow infiltration is typical and patients are often anaemic and/or pancytopenic. The diagnosis is best made from bone marrow aspiration and culture. It may also be detected in blood cultures.

M. fortuitum, and *M. chelonae* typically present as painful papular, nodular or ulcerating skin lesions. Both are classified as a rapidly growing mycobacteria and infect immunocompetent individuals. It is a natural environmental organism that has been found in water sources, sewage and dirt.

Other manifestations include osteomyelitis, lymphadenitis, and ocular disease (keratitis and corneal ulceration), usually a result of wound contamination after trauma.

Disseminated disease may be seen in immunosuppressed patients.

Mycobacterium marinum infection occurs when contaminated water is exposed to skin that has experienced open trauma. It is an uncommon infection that is usually seen in patients who handle fish or swim in freshwater or saltwater. The skin is the most common site of infection, where it usually produces a solitary indolent granulomatous lesion - the 'fish tank granuloma'.



[Q: 3000] OnExamination 2012 - Respiratory

A 17-year-old man presented with a strongly positive Mantoux test.

Which one of the following statements regarding his immune reaction is correct?

- 1- If a skin biopsy were taken, immunohistochemistry would show immune complex deposition
- 2- It is a cell mediated immune response
- 3- The area of induration will be less than 10 mm in diameter
- 4- The reaction typically develops within 24 hours

5- The response is mediated by B lymphocytes

Answer & Comments

Answer: 2- It is a cell mediated immune response

The Mantoux test replaced the Heaf test in 2005 in the UK. One of its uses is for patients who have had close contact with a person known to have tuberculosis. It measures the T cell-mediated immune response to TB antigen. Immune complexes are not involved (these result from antibody mediated immune responses).

The injection site should be reviewed 48-72 hours following intradermal inoculation of tuberculin. The left forearm is typically used. Only the induration, not surrounding erythema, is used in the measurement and the longest diameter is measured in millimetres:

- Less than 6mm: negative test, previously unvaccinated individuals can be given the BCG (within three months) provided there are no contraindications
- More than 6mm but less than 15mm: hypersensitive to tuberculin protein (may be due to previous TB infection, BCG, or atypical mycobacteria). Patients are not given the BCG if part of an immunisation programme. However, in other contexts (e.g. immigrant screening and contact tracing), further investigation should and follow-up may be indicated.
- More than 15mm: strongly hypertensive to tuberculin, suggestive of TB infection. Patients should be referred for further investigation and treatment

The reaction to tuberculin protein may be suppressed by viral infections, live viral vaccines, sarcoidosis, corticosteroids, immunosuppression, severe tuberculous disease and poor nutrition.



[Q: 3001] OnExamination 2012 - Respiratory

A 16-year-old male presents to his GP with exertional breathlessness.

The chest x ray reveals a lesion in the anterior mediastinum.

Which one of the following is the most likely cause for such an appearance?

- 1- Ascending aorta
- 2- Hilar lymph nodes
- 3- Left atrium
- 4- Oesophagus
- 5- Thymus gland

Answer & Comments

Answer: 5- Thymus gland

Abnormalities of the anterior/superior mediastinum may relate to the thymus, thyroid.

Inferior or middle mediastinal masses relate to the aorta, lungs, hilar lymph nodes, oesophagus and heart.

Posterior mediastinal masses may relate to the nerves and vertebrae.



[Q: 3002] OnExamination 2012 - Respiratory

In a study of a new drug for asthma, a researcher wishes to compare average serum drug concentrations in volunteers four hours after taking the drug:

- A. In the fasting state then
- B. After a meal.

Which of the following would be the most appropriate statistical test to use?

- 1- Chi-squared test
- 2- Pearson's correlation coefficient
- 3- Student's paired t test
- 4- Student's unpaired t test

5- Wilcoxon test

Answer & Comments

Answer: 3- Student's paired t test

In this scenario we are dealing with use of the drug in the same volunteers with the intervention being the effect of feeding on drug concentrations.

Thus you will be comparing means in the same subjects and the paired t test would be the most appropriate test.



[Q: 3003] OnExamination 2012 - Respiratory

A 63-year-old man presents with recurrent gradually increasing shortness of breath over the last few weeks.

His chest x ray is shown:

On examination his hands showed the following:

What is the diagnosis?

- 1- Chronic mucocutaneous candidiasis
- 2- Iron deficiency
- 3- Ochronosis
- 4- Polychondritis
- 5- Yellow nail syndrome

Answer & Comments

Answer: 5- Yellow nail syndrome

This is yellow nail syndrome where the nails are yellow, thickened, curved, stop growing and may become detached from the nail bed.

Associated findings include lymphoedema, bronchiectasis and pleural effusions.



[Q: 3004] OnExamination 2012 - Respiratory

A 32-year-old woman presents to the clinic with symptoms of pneumonia and you suspect

she has an underlying Mycoplasma infection.

On examination she is pyrexial, 38.2°C, her BP is 110/70 mmHg and her pulse is 90. She looks pale and has signs of a right sided pneumonia.

You suspect that she may have haemolytic anaemia.

Which of the following would you expect to find on laboratory testing?

- 1- Decreased LDH
- 2- Decreased reticulocyte count
- 3- Increase in bilirubin (predominantly conjugated)
- 4- Increased haptoglobin
- 5- Presence of spherocytes on the blood film

Answer & Comments

Answer: 5- Presence of spherocytes on the blood film

Reticulocyte counts are of course increased in haemolytic anaemia due to increased circulating immature red blood cells.

The increase in bilirubin is predominantly unconjugated. Lactate dehydrogenase (LDH) is increased and haptoglobins are reduced.

Urinary urobilinogen is increased and haemosiderinuria may be seen.



[Q: 3005] OnExamination 2012 - Respiratory

A 58-year-old man presents with a month history of breathlessness. He is a non-smoker.

On examination, his temperature was 36.7°C, with a respiratory rate of 20 breaths per minute and normal breath sounds to auscultation and a pulse of 92 bpm.

Arterial blood gases on air showed:

pH 7.51 (7.36 - 7.44)

pO₂ 8.4 kPa (11.3 - 12.6)

pCO₂ 4.0 kPa (4.7 - 6.0)

What is the most likely diagnosis?

- 1- Atypical pneumonia
- 2- Fibrosing alveolitis
- 3- Hysterical hyperventilation
- 4- Inhaled foreign body
- 5- Pulmonary thromboembolism

Answer & Comments

Answer: 5- Pulmonary thromboembolism

This patient has a respiratory alkalosis with type 1 respiratory failure as evidenced by low pO₂ and low pCO₂.

Chronic venous thromboembolism would be the most likely explanation for this man's presentation.

Hyperventilation would be excluded by the type 1 respiratory failure, an inhaled foreign body would not produce such a picture and an atypical pneumonia would be associated with pyrexia and some clinical signs.

The differential diagnosis here is pulmonary fibrosis but basal crackles may be expected and the history is somewhat short.



[Q: 3006] OnExamination 2012 - Respiratory

Which one of the following is correct regarding long acting beta-2 agonists?

- 1- Are beneficial in acute viral croup.
- 2- Become less effective over time (tolerance).
- 3- Can be used to prevent activity-induced symptoms without anti-inflammatory therapy.
- 4- Protect against allergen challenge for up to 48 hours.
- 5- Should not be used in association with erythromycin.

Answer & Comments

Answer: 3- Can be used to prevent activity-induced symptoms without anti-inflammatory therapy.

Long acting beta-2 agonists, for example salmeterol, can be used twice daily to assist in prophylaxis in chronic asthma as step 3 of the British Thoracic Society Asthma Guidelines.

There is no evidence that the bronchodilator effect wanes with time, though there is debate that it may become less effective in protecting against exercise or methacholine induced bronchospasm. Its duration of action is around 12 hours, and has gone completely by 36 hours.

Aminophylline interacts with erythromycin, giving an increased risk of toxicity.

There is no evidence that salmeterol works in viral croup, though oral steroids are highly effective.



[Q: 3007] OnExamination 2012 - Respiratory

A 40-year-old female is admitted with a suspected pulmonary embolism. A ventilation perfusion scan is requested.

Which of the following is true of lung ventilation perfusion scanning in suspected pulmonary embolism (PE)?

- 1- A normal perfusion scan virtually excludes pulmonary embolism (PE)
- 2- It is contraindicated if the patient is pregnant
- 3- It is contraindicated in those with iodine hypersensitivity
- 4- There is reduced perfusion in the upper lobes in mitral stenosis
- 5- The appearances of the scan is very different in those with pulmonary embolism and those with emphysema

Answer & Comments

Answer: 1- A normal perfusion scan virtually excludes pulmonary embolism (PE)

Increased pulmonary venous pressure, especially secondary to mitral valve disease, causes increased flow to the upper lobes.

Chronic obstructive pulmonary disease (COPD) usually gives rise to matched defects.

Radiation to the fetus is small.

Ventilation quotient (VQ) scan is not contraindicated in pregnant women, although the perfusion only scan is adequate.

Xenon is used for imaging ventilation, whilst technetium labelled macroaggregated human serum albumin (MAA) is used to image perfusion. A normal perfusion scan has a sensitivity of 98% but a specificity of only 40%.



[Q: 3008] OnExamination 2012 - Respiratory

Which of the following statements concerning industrial lung disorders is correct?

- 1- Occupational asthma occurs more frequently in atopic persons
- 2- Pneumoconiosis can be diagnosed in the absence of chest x ray abnormalities
- 3- Silo filler's disease is caused by allergy to grain
- 4- Widespread crepitations are typically heard in extrinsic allergic alveolitis (EAA)
- 5- Symptoms occur within minutes of exposure to mouldy hay in farmer's lung

Answer & Comments

Answer: 1- Occupational asthma occurs more frequently in atopic persons

Occupational asthma also occurs more frequently in smokers.

Pneumoconiosis is an x ray diagnosis. It is due to deposition of coal dust in parenchyma and

reaction to its presence. The types - simple/complicated - are diagnosed on x ray appearance.

Silo filler's disease is pulmonary oedema caused by inhalation of oxides of nitrogen generated by fresh silage.

Symptoms of farmer's lung usually occur within hours.

Examination in EAA usually reveals inspiratory crepitations which tend to be basal rather than widespread, sometimes squeaks, but wheeze is not typical.



[Q: 3009] OnExamination 2012 - Respiratory

A 54-year-old woman with multiple medical problems attends the respiratory clinic with increasing shortness of breath.

Medication of note includes dosulepin, omeprazole, amlodipine, ramipril and atorvastatin.

On examination her BP is 132/78 mmHg, pulse is 72 and regular. There are scattered inspiratory crackles throughout both lung fields. Pulmonary function testing reveals a restrictive defect.

Which of the following agents is most likely to be responsible?

- 1- Amlodipine
- 2- Atorvastatin
- 3- Dosulepin
- 4- Omeprazole
- 5- Ramipril

Answer & Comments

Answer: 3- Dosulepin

Dosulepin is recognised as a very rare cause of pulmonary fibrosis. Both subacute interstitial pneumonia and acute alveolitis have been reported in association with dosulepin therapy.

1. McEwan S R, Clark R A, Guthrie W. Dosulepin and fatal fibrosing alveolitis. Lancet 1986; i: 970

2. Veale D, Gilmartin J J. Acute alveolitis associated with dosulepin treatment. Br Med J 1985; 290: 606

None of the other agents listed are recognised as causes of pulmonary fibrosis.

More commonly recognised drug causes of pulmonary fibrosis include

Amiodarone

Bleomycin

Methotrexate

Busulphan

Gold

Nitrofurantoin and

Penicillamine.



[Q: 3010] OnExamination 2012 - Respiratory

A 62-year-old man presents to the respiratory clinic with increasing shortness of breath and reduced exercise tolerance over the past few months.

He has recently commenced a course of immunosuppressive therapy for mixed connective tissue disease.

On examination his BP is 125/72 mmHg, pulse is 80 and regular, saturations are 94% on air. There are fine inspiratory crackles on auscultation of the chest, and a CXR reveals evidence of diffuse interstitial shadowing.

Which of the following is the most likely causative agent?

- 1- Cyclophosphamide
- 2- Methotrexate
- 3- Penicillamine
- 4- Prednisolone

5- Sulphasalazine

Answer & Comments

Answer: 2- Methotrexate

Methotrexate is recognised to be associated with pulmonary fibrosis, it is however extremely effective in control of rheumatoid and psoriatic arthritis. Baseline pulmonary function tests are recommended prior to starting therapy, and physicians are warned to be alert to increased shortness of breath.

Cyclophosphamide is rarely associated with non-cardiogenic pulmonary oedema, rather than pulmonary fibrosis.

Penicillamine may rarely be associated with pulmonary haemorrhage.

The main concern of sulphasalazine therapy is its association with blood dyscrasias.



[Q: 3011] OnExamination 2012 - Respiratory

You are called to see a 67-year-old lady on the ward because of severe dyspnoea. She was admitted three days ago with an exacerbation of COPD.

Her respiratory rate is 36 /min, temp 37.2°C and BP 136/80 mmHg with a pulse of 102 /min. O₂ sat is 88% on 35 % O₂ (venturi mask). Her chest shows scattered wheezes with decreased air entry.

She is on IV antibiotics, nebulised B2 agonists, ipratropium and oral prednisolone 30 mg.

You check her blood gases and the results are as follows:

ph 7.28(7.35-7.45)

pCO₂ 9.4(4.7-6.0)

PO₂ 6.8(11.3-12.6)

Bicarbonate 29mmol/L(21-29)

Which is the best option for her next treatment?

- 1- BIPAP (bilevel positive airway pressure)
- 2- CPAP (continuous positive airway pressure)
- 3- Decrease O₂ to 28%
- 4- Intravenous corticosteroids
- 5- Mechanical ventilation

Answer & Comments

Answer: 1- BIPAP (bilevel positive airway pressure)

BiPAP is indicated in type 2 respiratory failure.

CPAP is used in type 1 respiratory failure.

Steroids will not help as the patient is already on a good dose.

Decreasing O₂ is not a good idea as the patient is hypoxic.

Mechanical ventilation may be considered if the patient does not improve on BiPAP.

Before considering BiPAP, optimisation of medical treatment should be done.



[Q: 3012] OnExamination 2012 - Respiratory

A 72-year-old man is referred to the chest clinic with a progressive history of dyspnoea, and a dry cough over the last eight months. He currently smokes 20/day and has done for 53 years.

He has had several episodes of acute shortness of breath for which he has received antibiotics from his GP.

On examination he is clubbed, and basal inspiratory crepitations are heard on auscultation. His oxygen saturations are 87% on air.

He undergoes a high-resolution computed tomography (HRCT) which demonstrates bilateral basal and subpleural reticular changes with honeycombing evident.

What is the most likely diagnosis?

- 1- Cryptogenic organising pneumonia (COP)
- 2- Desquamative interstitial pneumonia (DIP)
- 3- Non-specific interstitial pneumonia (NSIP)
- 4- Respiratory bronchiolitis - interstitial lung disease (RB-ILD)
- 5- Usual interstitial pneumonia (UIP)

Answer & Comments

Answer: 5- Usual interstitial pneumonia (UIP)

This patient most likely has idiopathic interstitial pneumonitis (IIP).

IIP is further subdivided into

Usual interstitial pneumonia (previously known as idiopathic pulmonary fibrosis, or cryptogenic fibrosing alveolitis) and

Non-usual interstitial pneumonitis.

UIP causes 70% of IIP. It is typically found in an older population and is characterised by a gradual onset with acute exacerbations. It is worse in smokers.

Reticular abnormalities, honeycombing and traction bronchiectasis are typical HRCT findings. Unfortunately patients with UIP have a poor response to steroids and immunosuppressants and the median survival is two to three years post-diagnosis.

The remaining answers are members of the non-usual interstitial pneumonitis (non-UIP). Of this group non-specific interstitial pneumonia (NSIP) is the most common. On CT there is typically ground glass appearance and there is better steroid responsiveness when compared to UIP, with an improved survival.

COP is subacute and tends to cause patchy consolidation and/or nodules on CT scan.

RB-ILD usually occurs in heavy smokers. CT findings include bronchial wall thickening and patchy ground glass appearance.

DIP is a form of severe RB-ILD.



[Q: 3013] OnExamination 2012 - Respiratory

Listed below are the five causes of hypoxia.

Which one of the five inevitably causes an increased $paCO_2$?

- 1- Diffusion impairment
- 2- Hypoventilation
- 3- Low inspired pO_2
- 4- Right-to-left shunt
- 5- Ventilation-perfusion mismatch

Answer & Comments

Answer: 2- Hypoventilation

Hypoventilation, where inadequate alveolar ventilation results in low alveolar PO_2 , is the only cause of hypoxia that inevitably causes raised $PaCO_2$.

If the hypoxia is out of proportion to the hypercapnia and the A-a PO_2 gradient increased then another mechanism (diffusion impairment, right-to-left shunt or ventilation-perfusion mismatch) must also be present.

The primary effects of right-to-left shunts and ventilation-perfusion mismatching are to raise arterial CO_2 content, however this is usually corrected (and sometimes over-corrected) by a reflex increase in ventilation.



[Q: 3014] OnExamination 2012 - Respiratory

A 32-year-old man who is a lifelong non-smoker presents to the respiratory clinic with shortness of breath, wheeze and a chronic cough. He works as a stone mason carving grave stones and has a property on a farm.

At the same time, his father maintains that he only ever used to smoke between five and ten cigarettes per day, yet he is 59-years-old with severe COPD on home oxygen.

On examination the patient has bilateral wheeze and coarse crackles consistent with obstructive lung disease.

Investigations show

Haemoglobin 12.1 g/dl(13.5-17.7)

White cell count $6.2 \times 10^9/L$ (4-11)

Platelets $172 \times 10^9/L$ (150-400)

Sodium 137 mmol/l (135-146)

Potassium 4.2 mmol/l (3.5-5)

Creatinine 88 $\mu\text{mol/l}$ (79-118)

Alanine amino transferase 86 U/l (5-40)

PEFR 280 l/min(Predicted 550)

Chest x ray Evidence of lower lobe emphysema

Which of the following is the most likely diagnosis?

- 1- Alpha-1 antitrypsin deficiency
- 2- Asthma
- 3- Chronic bronchitis
- 4- Extrinsic allergic alveolitis
- 5- Silicosis

Answer & Comments

Answer: 1- Alpha-1 antitrypsin deficiency

The clues are the very early development of obstructive lung disease, with lower lobe emphysema seen on CXR, and the fact that despite a relatively low pack year history of smoking, his father has developed severe chronic obstructive pulmonary disease (COPD).

Many patients with alpha-1 antitrypsin deficiency develop significant liver disease, including cirrhosis, and the raised alanine aminotransferase (ALT) seen here is suggestive of that.

Management of alpha-1 antitrypsin deficiency is similar to that for smoking-related COPD, with high dose inhaled steroids and

bronchodilators. Additionally, patients should be advised to avoid consumption of alcohol.

Alpha-1-antitrypsin replacement is available, but currently it is not recommended by NICE.



[Q: 3015] OnExamination 2012 - Respiratory

Which of the following statements is true of psittacosis (ornithosis)?

- 1- Infection responds rapidly to penicillin therapy
- 2- It does spread from person to person
- 3- It is more of a risk to children than to adults who are exposed to birds
- 4- It is only a risk from contact with psittacines (parrots), not other birds
- 5- It usually causes many polymorphs to be present in the sputum

Answer & Comments

Answer: 2- It does spread from person to person

Chlamydia psittaci is endemic in birds including psittacine birds, canaries, finches, pigeons and poultry.

Pet owners, vets and zoo keepers are most at risk. It is rare in children.

Person to person transmission occurs especially in a hospital environment.

Sputum Gram stain reveals a few leucocytes and no predominant bacteria. There are few signs and few laboratory/x ray findings.

Positive serology is with complement-fixing antibodies.

It is treated with tetracycline.



[Q: 3016] OnExamination 2012 - Respiratory

A 29-year-old man is diagnosed with

pulmonary tuberculosis.

A blood sample is sent to determine his acetylator status prior to starting therapy. This showed that he was a fast acetylator. He was subsequently started on antituberculous therapy that included isoniazid.

Which of the following statements is correct?

- 1- There is an increased risk of convulsions
- 2- There is a higher plasma drug concentration
- 3- There is an increased risk of hepatitis
- 4- There is an increased risk of megaloblastic anaemia
- 5- There is an increased risk of peripheral neuropathy

Answer & Comments

Answer: 3- There is an increased risk of hepatitis

This is a tricky question, especially as there is a lot of debate in the literature about this issue. It is important, however, not to get too bogged down in detail and appreciate the key points for the MRCP exam.

Isoniazid is metabolised primarily by acetylation and dehydrazination.

The rate of acetylation is genetically determined. Approximately 50% of black and Caucasian people are 'slow acetylators' and the rest are 'rapid acetylators'. The majority of Eskimos and Orientals are 'rapid acetylators'.

Fast acetylation leads to higher blood levels of the toxic metabolite acetylisoniazid and thus to an increase in toxic hepatitis which is 250 times more common than in slow acetylators.

Slow acetylators, on the other hand, may be associated adverse effects secondary to higher drug concentrations, which can lead to peripheral neuropathy.



[Q: 3017] OnExamination 2012 - Respiratory

A 7-month-old boy is presented to a doctor by his parents with symptoms of recurrent upper respiratory tract infections. No other members of the family suffer from any similar infections.

Physical examination showed mild facial hypoplasia.

Biochemistry investigations revealed hypocalcaemia.

Microbiological investigations were normal and immunoglobulins were within normal limits.

The infant's immune function would show which of the following deficiencies?

- 1- B cell number and function
- 2- Complement deficiency
- 3- Macrophage number and function
- 4- Plasma cell
- 5- T cell number and function

Answer & Comments

Answer: 5- T cell number and function

This child suffers from DiGeorge's syndrome.

Patients with DiGeorge's syndrome often have near normal levels of immunoglobulins but with significant decreases in T cell numbers and relative increase in the percentage of B cells.



[Q: 3018] OnExamination 2012 - Respiratory

A lifelong non-smoker is diagnosed with emphysema.

Which of the following would be the most likely aetiological agent?

- 1- Asbestos
- 2- Cadmium exposure
- 3- Isocyanates

4- Steel

5- Zinc

Answer & Comments

Answer: 2- Cadmium exposure

Cadmium fume inhalation is a recognised cause of emphysema.

Other industrial associations with chronic obstructive pulmonary disease (COPD) include

Coal

Cotton

Grain and

Cement.



[Q: 3019] OnExamination 2012 - Respiratory

A 45-year-old man develops facial swelling and breathlessness.

His chest x ray reveals paratracheal lymphadenopathy.

Which of the following statements is most accurate regarding the superior vena caval obstruction (SVCO)?

- 1- The most common cause is squamous cell carcinoma
- 2- Treatment of choice is radiotherapy
- 3- It may be associated with voice hoarseness
- 4- It is associated with Kussmaul's sign
- 5- The commonest symptom is stridor

Answer & Comments

Answer: 3- It may be associated with voice hoarseness

A. SVCO is most likely caused by bronchogenic carcinoma, especially small cell carcinoma (10% of small cell cancers present with SVCO) due to mediastinal lymphadenopathy. Other causes include:

Lymphoma

Aortic aneurysm

Mediastinal fibrosis and

Mediastinal goitre.

B. Chemotherapy ± radiotherapy is the treatment of choice in small cell carcinoma. Radiotherapy may be the treatment of choice for non-small cell carcinoma. Median survival of lung cancer presenting with SVCO, even with treatment is five months. Lymphoma has a better prognosis and will require specific chemotherapy ± radiotherapy.

C. Recurrent laryngeal nerve palsy usually occurs with malignant tumour but can occur with aneurysm of aortic arch. There may also be Horner's syndrome due to involvement of sympathetic chain. Compression of vital structures can result in stridor and dysphagia.

D. SVCO is associated with elevated non-pulsatile jugular venous pressure (JVP). Kussmaul's sign is the paradoxical rise in JVP on inspiration due to constrictive pericarditis or significant pericardial effusion.

E. The commonest symptoms are usually cough and chest pain, due to the distortion of mediastinal anatomy. Physical signs are often absent or minimal, but classically there are facial and periorbital oedema, chemosis and distended veins.



[Q: 3020] OnExamination 2012 - Respiratory

A 67-year-old retired plumber presents to the clinic with increasing shortness of breath and dull left sided chest pain.

You understand that this has been a problem for some six months or more. There is no past medical history of note apart from essential hypertension for which he takes ramipril 10 mg / day.

Investigations show:

Haemoglobin 13.6 g/dl(13.5-17.7)

White cell count $9.1 \times 10^9/L$ (4-11)

Platelets $252 \times 10^9/L$ (150-400)

Sodium 137 mmol/l (135-146)

Potassium 3.7 mmol/l (3.5-5)

Creatinine 119 $\mu\text{mol/l}$ (79-118)

pH 7.41(7.35-7.45)

pCO₂ 6.2 kPa(4.8-6.1)

pO₂ 9.6 kPa (10-13.3)

CXR Large left pleural effusion

Which of the following is the optimal investigation to deliver the diagnosis?

- 1- Blind pleural biopsy
- 2- CT thorax
- 3- Sputum cytology
- 4- Thoracocentesis
- 5- Thoracoscopy with drainage and biopsy

Answer & Comments

Answer: 5- Thoracoscopy with drainage and biopsy

Blind pleural biopsy may result in tissue being obtained from an area not affected by mesothelioma. As such this is not correct.

Whilst thoracocentesis is likely to obtain malignant cells, the histopathologist may not be able to type them adequately.

CT scanning may reveal structural abnormalities but will not give a histological diagnosis and sputum cytology would be unlikely to reveal malignant cells.



[Q: 3021] OnExamination 2012 - Respiratory

A 32-year-old man is admitted by ambulance after being caught up in a house fire and gas explosion whilst trying to rescue a neighbour.

He has been resuscitated at the scene, but on arrival in the Emergency department is extremely unwell. His saturations are 91% on

a non-rebreather; his BP is 142/82 mmHg with a pulse of 84. There is audible stridor and bibasal crackles on auscultation of the chest. Portable chest is suggestive of pulmonary oedema.

Which of the following is the most appropriate management?

- 1- BIPAP
- 2- Intubation and ventilation
- 3- IV furosemide
- 4- IV nitrate
- 5- IV noradrenaline

Answer & Comments

Answer: 2- Intubation and ventilation

The suspicion here is that this patient has non-cardiogenic pulmonary oedema as a result of smoke inhalation. There is also stridor, a sign of laryngeal oedema and this patient is at significant risk of airway obstruction. As such the optimal management is intubation and ventilation.

BIPAP is inappropriate because of the risk of airway obstruction.

The other treatments are conventional ones for cardiogenic pulmonary oedema.



[Q: 3022] OnExamination 2012 - Respiratory

A 31-year-old woman is brought to the Emergency department by ambulance. She has just got off a long-haul flight and collapsed at the baggage carousel.

On examination in the department she is hypotensive with a BP of 80/50 mmHg, her pulse is 95 and regular. Her chest is clear and her abdomen is soft and non-tender. You notice that her left leg appears swollen.

Investigations show:

pH 7.38 (7.35-7.45)

pO₂ 9kPa (10-13.3) on non-rebreather

pCO₂ 3.6kPa (4.8-6.1)

ECG - Right heart strain

Which of the following would be an indication for thrombolysis in this patient?

- 1- BP 80/50
- 2- ECG showing right heart strain
- 3- pCO₂ 3.6
- 4- pH 7.38
- 5- pO₂ 9

Answer & Comments

Answer: 1- BP 80/50

Hypotension and cardiogenic shock are the most significant factors associated with increased mortality in massive pulmonary embolus (PE). As such it is the BP here which drives progression to thrombolysis rather than anti-coagulation.

The pH is in the normal range, as such it would not be a driver of more aggressive intervention here.

All of the other factors are indications of a large PE, but without hypotension they would not necessarily drive thrombolysis or surgical embolectomy. This is because the evidence for thrombolysis in sub-massive PE is much less strong than that for a massive event.



[Q: 3023] OnExamination 2012 - Respiratory

A 76-year-old lady with COPD wants to visit a friend in Japan.

Her FEV₁ is 40 %. Her last hospital admission was four months ago. She is known to have significant kyphoscoliosis. Her O₂ sat on air is 93 %. You perform a hypoxic challenge and her pO₂ is 7.8.

What would you advise?

- 1- Advise inflight oxygen 28%
- 2- Advise inflight oxygen 35%

- 3- Advise not to fly
- 4- Allow flight and no oxygen required
- 5- Perform a walking test

Answer & Comments

Answer: 4- Allow flight and no oxygen required

An hypoxic challenge test gives the patient FiO₂ 15% for 15 minutes and measures PO₂.

PaO₂ > 7.4 kPa (> 55 mmHg) - Oxygen not required.

PaO₂ 6.6-7.4 kPa (50-55 mmHg) - Borderline. A walk test may be helpful.

PaO₂ < 6.6 kPa (< 50 mmHg) - In-flight oxygen (2L/min).



[Q: 3024] OnExamination 2012 - Respiratory

A 73-year-old woman is referred to the emergency medical take with a lower respiratory tract infection. She has seen the GP because of an increasingly problematic cough, productive of rusty coloured sputum and severe shortness of breath.

On examination in the Emergency department her blood pressure is 135/82 mmHg. Her temperature is 38.5°C and her pulse is 80 and regular. Her respiratory rate is 22. Auscultation of the chest reveals right lower lobe consolidation.

Investigations show:

Haemoglobin 12.1 g/dl(11.5-16.0)

White cell count 12.2 x 10⁹/L (4-11)

Platelets 209 x 10⁹/L (150-400)

Serum Sodium 135 mmol/l (135-146)

Serum Potassium 4.4 mmol/l (3.5-5)

Creatinine 125 µmol/l (79-118)

Urea 10.2 mmol/l (2.5-6.7)

Glucose 5.4 mmol/l (4.5-5.6)

Chest x ray Right lower lobe pneumonia

Which of the following features is consistent with scoring a point on the CURB criteria?

- 1- BP 135/82
- 2- Creatinine 125
- 3- Respiratory rate 22
- 4- Urea 10.2
- 5- White cell count 12.2

Answer & Comments

Answer: 4- Urea 10.2

The CURB criteria are based on the presence of

Confusion

Urea >7

Respiratory rate >30/min

BP <90/60 mmHg.

The utility of CURB scoring is in determining possible patients who may be discharged from hospital and those who are at greatest risk with respect to mortality.

High scores can be used to determine which patients should be managed on the respiratory HDU or who needs ITU support.



[Q: 3025] OnExamination 2012 - Respiratory

A 19-year-old student has been brought to the emergency department by his housemates.

He was diagnosed with chicken pox a few days earlier by a GP, told to go home, rest, stay well hydrated and take regular paracetamol. He now presents with a dry cough and increasing shortness of breath.

On examination he looks unwell and is pyrexial 37.8°C. He has a widespread rash consistent with chicken pox. His BP is 132/72 mmHg and his respiratory rate is 29. There is

wheeze on auscultation of the chest. Saturation is 92% on air.

Investigations show:

Haemoglobin 13.8 g/dl(13.5-18)

White cell count $8.1 \times 10^9/L$ (4-10)

Platelets $191 \times 10^9/L$ (150-400)

Sodium 140 mmol/l (134-143)

Potassium 4.0 mmol/l (3.5-5)

Creatinine 100 $\mu\text{mol/l}$ (60-120)

CXR Bilateral pneumonitis

Which of the following is the most appropriate management?

- 1- IV aciclovir
- 2- IV penicillin
- 3- Oral aciclovir
- 4- Supportive care with fluids and paracetamol
- 5- Varicella zoster immunoglobulin

Answer & Comments

Answer: 1- IV aciclovir

This man has chicken pox pneumonitis which has a high level of morbidity and mortality, occurring more commonly in older children and young adults where it may occur in 20% of individuals.

Treatment of choice is initial IV aciclovir.

Varicella zoster immunoglobulin is only recommended as post exposure prophylaxis in patients at significant risk from varicella infection.

Secondary bacterial infection may occur.



[Q: 3026] OnExamination 2012 - Respiratory

A 42-year-old lady re-attends the chest clinic following investigations that have confirmed a diagnosis of sarcoidosis.

Which of the following would be a poor prognostic sign?

- 1- Caucasian race
- 2- Current smoker
- 3- Erythema nodosum
- 4- Lupus pernio
- 5- Markedly elevated serum ACE level

Answer & Comments

Answer: 4- Lupus pernio

The American Thoracic Society has produced a statement on the prognostic indicators associated with sarcoidosis.

Lupus pernio is a chronic raised indurated (hardened) lesion of the skin, often purplish in color, and is associated with sarcoid. It is noted to be an adverse prognostic factor.

Other adverse prognostic factors include;

Age of onset >40 years

Afro-Caribbean or Afro-American race

Cardiac involvement

Chronic hypercalcaemia

Nasal mucosal involvement

Neurosarcoidosis

Progressive pulmonary sarcoidosis.



[Q: 3027] OnExamination 2012 - Respiratory

A 58-year-old man is admitted with bacterial pneumonia following influenza. He initially improved but subsequently developed a cough productive of purulent blood-stained sputum and swinging fevers.

On examination he is pyrexial 38.4°C, has a BP of 110/70 mmHg and a pulse of 105. You can hear coarse crackles throughout both lung fields, decreased air entry and a stony dull percussion note at the right base.

Investigations reveal

Haemoglobin 12.8 g/dl(13.5-18)

White cell count 13.1 x 10⁹/L (4-10)

Platelets 192 x 10⁹/L (150-400)

Sodium 141 mmol/l (134-143)

Potassium 4.3 mmol/l (3.5-5)

Creatinine 145 µmol/l (60-120)

CXR Bilateral basal consolidation, right-sided pleural effusion

Which of the following is the next appropriate investigation?

- 1- Blood cultures
- 2- CT thorax
- 3- Diagnostic pleural fluid sampling
- 4- MRI thorax
- 5- Ultrasound thorax

Answer & Comments

Answer: 3- Diagnostic pleural fluid sampling

The BTS guidelines on pleural infection contain a clear flow chart which recommends diagnostic pleural fluid sampling as the next most appropriate investigation.

If it is not possible to obtain fluid, then drainage under ultrasound should be attempted.

If pus is obtained then the pH should be recorded and the sample sent for culture.

If pus is not obtained then the respiratory team should be involved prior to the insertion of a chest drain.



[Q: 3028] OnExamination 2012 - Respiratory

A 50-year-old lady presented to the Emergency department with cough and dyspnoea for the past two days.

She was previously well. She smokes 20 cigarettes per day.

She has a temperature of 38.3°C and is agitated and confused. Her pulse is 110/min and her blood pressure is 88/60 mmHg. Her oxygen saturation is 89% on air and she has a respiratory rate of 40/min.

Chest x ray shows left basal consolidation.

Results show:

Sodium 143 mmol/L(137-144)

Potassium 3.8 mmol/L(3.5-4.9)

Urea 9.2 mmol/L(2.5-7.5)

Creatinine 85 µmol/L(60-110)

Her CURB score is documented and she is admitted to hospital with severe pneumonia.

Which of the following would count towards her CURB score?

- 1- Consolidation on chest x ray
- 2- Oxygen saturation
- 3- Peak expiratory flow rate
- 4- Raised blood urea
- 5- Temperature

Answer & Comments

Answer: 4- Raised blood urea

The CURB score is calculated by assessment of core adverse prognostic features which are used in assessment of severity of pneumonia.

Two from four features indicate a severe pneumonia and hospital admission is advised.

The CURB score is calculated using:

1. Confusion abbreviated mental test score less than 8.
2. Urea more than 7 mmol/l.
3. Respiratory rate more than 30/min.
4. Blood pressure; systolic BP less than 90 or diastolic BP less than 60 mmHg.



[Q: 3029] OnExamination 2012 - Respiratory

Which of the following is not employed in the laboratory diagnosis of respiratory viral infections?

- 1- ELISA
- 2- Haemagglutination
- 3- Immunofluorescence
- 4- Single radial haemolysis (SRH)
- 5- Tissue culture

Answer & Comments

Answer: 4- Single radial haemolysis (SRH)

Rapid antigen detection kits utilising direct immunofluorescence are used to demonstrate:

Respiratory syncytial virus (RSV)

Influenza

Parainfluenza and

Adenovirus

in respiratory secretions.

Respiratory viruses can be grown in various cell lines, for example, HeLa cells or fibroblasts.

Influenza is a haemagglutinating virus as red cells stick to the infected cells after addition to the culture.

Enzyme-linked immunosorbent assay (ELISA) is used to look for antibodies in acute and convalescent sera.

The SRH test is used to screen for rubella antibodies in pregnant women.



[Q: 3030] OnExamination 2012 - Respiratory

An 18-year-old woman presents with red, tender lumps on her shins and arthralgia.

Chest x ray shows bilateral hilar lymphadenopathy and clear lung fields. A clinical diagnosis of sarcoidosis is made.

Which one of the following is the most appropriate management plan?

- 1- 24 hour urinary calcium measurement
- 2- Follow up appointment with chest x ray in three months
- 3- Mediastinoscopy and lymph node biopsy
- 4- Skin biopsy
- 5- Thoracic CT scan

Answer & Comments

Answer: 2- Follow up appointment with chest x ray in three months

This is also known as Löfgren's syndrome (a benign form of sarcoidosis).

The presentation of erythema nodosum-arthropathy-bilateral hilar lymphadenopathy syndrome is so characteristic that histological diagnosis is not necessary.

The prognosis is excellent with less than 10% having persistent disease.

With less characteristic presentations, positive biopsies are needed.

Mediastinoscopy is the method of choice for anterior mediastinal nodes.



[Q: 3031] OnExamination 2012 - Respiratory

A 58-year-old man is admitted to the Emergency department some five days after becoming unwell with influenza.

Over the past 48 hours he has become progressively more short of breath with a cough productive of purulent and bloody sputum.

On examination he is pyrexial 38.6, his BP is 95/60 mmHg, pulse is 95 and regular. His

saturations are 93% on air. There are signs of extensive right sided consolidation.

Investigations show:

Haemoglobin 13.4 g/dl(13.5-17.7)

White cell count $14.9 \times 10^9/L$ (4-11)

Platelets $191 \times 10^9/L$ (150-400)

Sodium 135 mmol/l (135-146)

Potassium 4.1 mmol/l (3.5-5)

Creatinine 132 micromol/l (79-118)

CXR - Right sided consolidation with evidence of cavitation.

Which of the following is the most appropriate therapy?

- 1- Benzylpenicillin
- 2- Ciprofloxacin
- 3- Clarithromycin
- 4- Doxycycline
- 5- Flucloxacillin

Answer & Comments

Answer: 5- Flucloxacillin

The history of pneumonia with cavitation post-influenza raises the possibility of staphylococcal pneumonia; as such flucloxacillin is the most appropriate answer. In patients with a history of alcoholism, Klebsiella in particular may be an alternative diagnosis.

Benzylpenicillin would be a consideration if Pneumococcus is the most likely diagnosis, with clarithromycin an alternative in those who are penicillin allergic.

Doxycycline may be considered in Chlamydia pneumoniae.



[Q: 3032] OnExamination 2012 - Respiratory

A 21-year-old student presents to the Emergency department with fever, cough and

significant wheeze; he has returned a few days ago from a long trip working with an aid organisation in East Asia.

On examination he is pyrexial 37.8°C, his pulse is 88 and regular and his BP is 110/72 mmHg. He has marked wheeze on auscultation of his chest. There is an urticarial rash on his buttocks and he has some abdominal discomfort.

Investigations show:

Haemoglobin 12.3 g/dl(11.5-16.0)

White cell count $7.1 \times 10^9/L$ (4-11)

Eosinophils $0.8 \times 10^9/L$ (0.04 - 0.4)

Platelets $182 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (135-146)

Potassium 4.1 mmol/l (3.5-5)

Creatinine 102 $\mu\text{mol/l}$ (79-118)

Which of the following is the most likely cause?

- 1- Enterobius
- 2- Diphyllbothrium
- 3- Schistosomiasis
- 4- Strongyloides
- 5- Taenia

Answer & Comments

Answer: 4- Strongyloides

Strongyloides is associated with a larval stage, the pulmonary migration of which can lead to symptoms of bronchospasm with severe wheeze and shortness of breath. This is also known as Loeffler's syndrome.

Tapeworms, of which Diphyllbothrium and Taenia are species, result in predominantly gastrointestinal symptoms such as abdominal pain and intermittent obstruction.

Schistosomiasis can manifest as a cough, but symptoms are not usually as severe as those seen here.

Enterobius is a species of threadworm which does not have a larval stage which affects the lungs.



[Q: 3033] OnExamination 2012 - Respiratory

A 69-year-old lady is seen in chest clinic for her increasing breathlessness. She has a significant smoking history having smoked 40/day for 50 years.

When questioned she reports that she notices that she has to walk slower than her husband and friends due to her breathlessness. When walking at her own pace she often stops every 300 m, again due to breathlessness.

What grade of dyspnoea does she have according to the MRC dyspnoea scale?

- 1- Grade I
- 2- Grade II
- 3- Grade III
- 4- Grade IV
- 5- Grade V

Answer & Comments

Answer: 3- Grade III

One of the main symptoms of chronic obstructive pulmonary disease (COPD) is breathlessness and the MRC dyspnoea scale should be used to quantify this.

GradeDegree of breathlessness related to activities

1Not troubled by breathlessness except on strenuous exercise

2Short of breath when hurrying or walking up a slight hill

3 Walks slower than contemporaries on level ground because of breathlessness, or has to stop for breath when walking at own pace

4Stops for breath after walking about 100 metres or after a few minutes on level ground

5 Too breathless to leave the house, or breathless when dressing or undressing

Adapted from Fletcher CM, Elmes PC, Fairbairn MB et al. (1959) The significance of respiratory symptoms and the diagnosis of chronic bronchitis in a working population. British Medical Journal 2: 257-66.



[Q: 3034] OnExamination 2012 - Respiratory

Which of the following conditions may result in pulmonary hypertension (PH) by causing pulmonary venous hypertension?

- 1- Acute respiratory distress syndrome (ARDS)
- 2- Chronic obstructive airways disease (COAD)
- 3- Chronic thromboembolism
- 4- Interstitial lung disease (ILD)
- 5- Veno-occlusive disease

Answer & Comments

Answer: 5- Veno-occlusive disease

Pulmonary venous hypertension with increased left atrial pressure is most commonly caused by left ventricular dysfunction as in congestive cardiac failure, which causes an elevation in PA pressure by increased back-pressure through the lungs.

Other causes of pulmonary venous hypertension include mitral stenosis or insufficient, fibrosing mediastinitis and veno-occlusive disease.

Acute or chronic thromboembolism causes PH by mechanical obstruction of the pulmonary arteries.

Respiratory disease including ILD, COAD and ARDS causing hypoxia leads to constriction of the pulmonary arteries. Any disorder resulting in hypoxia may cause PH.



[Q: 3035] OnExamination 2012 - Respiratory

A 48-year-old gentleman with moderate chronic obstructive pulmonary disease (COPD), and multiple previous presentations to the Emergency department presents with a two hour history of mild pleuritic chest pain.

He is minimally breathless, with oxygen saturations of 96% on air (he usually has saturations of 95-97%).

A chest x ray is performed and an observant CT1 recognises a 1.8 cm (18 mm) apical pneumothorax on a background of chronic changes consistent with emphysema/emphysematous changes.

Accordingly to current guidelines, what intervention should be undertaken?

- 1- Admit and treat with high flow oxygen and repeat CXR in 24 hours
- 2- Aspirate and admit for 24 hours observation
- 3- Aspirate and discharge home after 12 hours if well
- 4- Discharge with advice to return if symptoms worsen
- 5- Intercostal chest drain insertion (Seldinger technique)

Answer & Comments

Answer: 2- Aspirate and admit for 24 hours observation

This patient has a small apical pneumothorax most likely as a result of his underlying lung disease and as such can be classed as a secondary pneumothorax.

According to current BTS guidelines, if the patient is under 50, minimally breathless and the rim of air is less than 2 cm the initial intervention should be simple aspiration. Even if successful the patient should be admitted and observed for at least 24 hours.

Unlike a primary pneumothorax, a secondary pneumothorax always requires intervention.

Aspiration is less likely to be effective in a secondary pneumothorax and so if it fails or does not meet the above criteria, a chest drain needs to be inserted. The Seldinger technique using a 16G is the preferred method for this.

Blunt dissection is usually reserved for trauma cases.

Management of spontaneous pneumothorax



[Q: 3036] OnExamination 2012 - Respiratory

A 26-year-old man who works in a car body shop spray painting vehicles comes to the respiratory clinic complaining of increasing shortness of breath and wheeze. He says that he is fine at the end of a weekend off, and particularly well when he goes on holiday, but steadily gets worsening symptoms from Monday to Friday.

He is a non-smoker who has no significant past medical history. On examination his BP is 125/75 mmHg, his pulse is 75 and regular. He has significant bilateral wheeze and a non-productive cough.

Investigations show

Haemoglobin 14.9 g/dl (13.5-17.7)

White cell count $5.6 \times 10^9/L$ (4-11)

Platelets $192 \times 10^9/L$ (150-400)

Serum Sodium 140 mmol/l (135-146)

Serum Potassium 4.0 mmol/l (3.5-5)

Creatinine 90 $\mu\text{mol/l}$ (79-118)

PEFR 245 l/min

Which of the following is the best initial way to elucidate any link between the workplace and possible asthma?

- 1- Bronchial hyper-responsiveness testing
- 2- Radioallergosorbent testing

- 3- Serial peak flow measurement including weekdays and weekends
- 4- Skin testing
- 5- Specific bronchial provocation testing

Answer & Comments

Answer: 3- Serial peak flow measurement including weekdays and weekends

The most obvious initial investigation is to get the patient to keep a peak flow diary with multiple measurements at different times in the day and involving both weekdays and weekends.

Detailed pulmonary function tests, and radioallergosorbent (RAST) or skin testing may also be part of the work up, but the peak flow diary is the best way to establish the temporal relationship between asthma and the paint spraying. Once the specific trigger is identified he may either need to be given special equipment to protect him from exposure, or moved to a different role.

Simply treating his asthma with appropriate medication is not appropriate.



[Q: 3037] OnExamination 2012 - Respiratory

A 45-year-old man presents to the clinic for review.

Over the past few months he has suffered increasing night sweats, fatigue, weight loss and a chronic cough. In addition he has presented to his GP with bilateral parotid swelling and red, painful eyes on three occasions in the past year. Most recently he has suffered a weakness of the left side of his face.

On examination his BP is 135/75 mmHg, pulse is 80 and regular, there are bilateral scattered crackles on auscultation of the chest and bilateral parotid swellings. He has a left lower motor neurone seventh nerve palsy.

Investigations show:

Haemoglobin 14.1 g/dl(13.5-17.7)

White cell count $6.2 \times 10^9/L$ (4-11)

Platelets $312 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (135-146)

Potassium 3.8 mmol/l (3.5-5)

Creatinine 110 micromol/l (79-118)

Which of the following is the most likely diagnosis?

- 1- Felty's syndrome
- 2- Heerfordt's syndrome
- 3- Lofgren's syndrome
- 4- Meig's syndrome
- 5- Turner's syndrome

Answer & Comments

Answer: 2- Heerfordt's syndrome

Felty's syndrome is the association of rheumatoid arthritis and hypersplenism.

Lofgren's syndrome is the association of erythema nodosum and arthritis.

Meig's syndrome is the association of a benign ovarian tumour and pleural effusion.

Turner's is the syndrome associated with the XO sex chromosome type.



[Q: 3038] OnExamination 2012 - Respiratory

An 18-year-old female is admitted with a depression of her conscious level.

Arterial blood gas analysis revealed:

pH 7.26 (7.36-7.44)

pO₂ 12.1 kPa (11.3-12.6)

pCO₂ 3.9 kPa (4.7-6.0)

Standard bicarbonate 14.7 mmol/L (20-28)

Which one of the following would account for these results?

- 1- Analytical error
- 2- Metabolic acidosis
- 3- Persistent vomiting
- 4- Respiratory acidosis
- 5- Respiratory alkalosis

Answer & Comments

Answer: 2- Metabolic acidosis

This patient has a metabolic acidosis with an effort at respiratory compensation as reflected by elevated pO₂ and reduced pCO₂.

This could be due to poisoning or a condition such as diabetic ketoacidosis.

Vomiting would cause a metabolic alkalosis.



[Q: 3039] OnExamination 2012 - Respiratory

A 16-year-old girl presents with an acute exacerbation of asthma.

On examination her respiratory rate was 30 per minute, her heart rate was 120 beats per minute and a peak expiratory flow rate (PEFR) was 30% of the predicted value.

Her blood gas analysis on air shows:

paO₂ 9 kPa(11.3-12.6)

paCO₂ 3.5 kPa(4.7-6.0)

After the administration of oxygen and corticosteroids what is the most appropriate next step in management?

- 1- Intravenous aminophylline
- 2- Intravenous salbutamol
- 3- Ipratropium bromide via oxygen-driven nebuliser
- 4- Salbutamol via oxygen-driven nebuliser
- 5- Salmeterol via breath-actuated inhaler

Answer & Comments

Answer: 4- Salbutamol via oxygen-driven nebuliser

This patient has severe asthma as revealed by the low PEFr, low P02 and signs.

The next stage in the management is the administration of nebulised beta 2 agonists with supplementation of high flow oxygen (minimum of 6 l/minute). Beta 2 agonists can be administered in 15-30 minute intervals if required.

Intravenous therapy with beta 2 agonists should only be used if inhaled therapies cannot be reliably administered.



[Q: 3040] OnExamination 2012 - Respiratory

A 50-year-old male presented with acute respiratory failure during an episode of acute pancreatitis and was thought to have developed adult respiratory distress syndrome (ARDS).

Which of the following would support a diagnosis of ARDS?

- 1- High protein pulmonary oedema
- 2- High pulmonary capillary wedge pressure
- 3- Hypercapnia
- 4- Increased lung compliance
- 5- Normal chest x ray

Answer & Comments

Answer: 1- High protein pulmonary oedema

ARDS is characterised by:

Hypoxaemia

Reduced lung compliance

Pulmonary hypertension

Pulmonary infiltrates on the chest x ray.

There is damage to the capillary and endothelial cell linings resulting in oedema and leakage of proteins and cells into the interstitial and alveolar spaces at normal pulmonary capillary hydrostatic pressures.

Wedge pressure, unlike the high pressures seen with left ventricular failure and pulmonary oedema, is often normal.

Hypercapnia, often a late feature of ARDS, does not distinguish from any other cause of type 2 respiratory failure.



[Q: 3041] OnExamination 2012 - Respiratory

Which of the following is true concerning whooping cough (pertussis)?

- 1- Is a greater threat to children during the second six months of life, after maternal antibody has declined, than during the first six months
- 2- Is associated with convulsions less frequently than is the case with other febrile conditions
- 3- Is characteristically associated with a polymorph leucocytosis
- 4- May lead to hemiplegia
- 5- Rapidly resolves with antibiotic treatment

Answer & Comments

Answer: 4- May lead to hemiplegia

Whooping cough (pertussis) is caused by the bacterium *Bordetella pertussis*.

B. pertussis is a very small gram-negative aerobic coccobacillus that appears singly or in pairs.

Infection is characterised by paroxysms of coughing.

Lymphocytosis is typically found.

Hemiplegia is a recognised effect of severe whooping cough.

The pertussis vaccine is estimated to be 63% to 94% effective in the diphtheria-pertussis-tetanus (DPT) shot.



[Q: 3042] OnExamination 2012 - Respiratory

A 67-year-old patient with a history of COPD is being assessed by the community COPD team for his suitability for treatment at home (under the Hospital at Home scheme) for his latest exacerbation.

Which of the following is a contraindication to Hospital at Home (HaH) treatment?

- 1- Acute changes on a chest x ray
- 2- Dementia
- 3- Increasing age
- 4- Long term oxygen therapy (LTOT)
- 5- Longer duration of COPD

Answer & Comments

Answer: 1- Acute changes on a chest x ray

A specific subtype of intermediate care is Hospital at Home (HaH), where active treatment is provided by healthcare professionals in the patient's home for a condition that otherwise would require hospital care.

BTS has issued recommendations as to whom HaH should be offered. It recommends that HaH should not be offered in the below instances;

Impaired level of consciousness

Acute confusion

pH 7.35, if arterial blood gases have been measured

Acute changes on chest radiograph

Concomitant medical problem requiring inpatient stay

Insufficient social support, no telephone, residence geographically removed from hospital

New hypoxaemia (SpO₂ 90%) - a contraindication if oxygen cannot be provided at home.

Although factors such as increasing age and duration of COPD have been shown in studies to identify those at increased risk of relapse, they have only a moderate sensitivity and specificity, and hence are not included in the listed contraindications.



[Q: 3043] OnExamination 2012 - Respiratory

A 47-year-old woman with a history of asthma is referred with deteriorating symptoms from a lower respiratory tract infection.

She has been laid up in bed for the whole of the previous week with influenza, but most recently, as her upper respiratory symptoms have improved, she has begun to develop a cough productive of purulent blood stained sputum and has severe right lower pleuritic chest pain.

On examination she is pyrexial 38.2°C, her BP is 105/65 mmHg, and her pulse is 108. There is right-sided consolidation.

Investigations show

Hb 12.9 g/dl (13.5-18)

WCC 15.2 x 10⁹/L (4-10)

PLT 213 x 10⁹/L (150-400)

Na 135 mmol/l (134-143)

K 4.5 mmol/l (3.5-5)

Cr 139 µmol/l (60-120)

CRP 210 mg/l (<10)

CXR Extensive right lower lobe consolidation with cavitation

Which of the following is the most likely infective organism?

- 1- Chlamydia

- 2- Klebsiella
- 3- Legionella
- 4- Staphylococcus
- 5- Streptococcus

Answer & Comments

Answer: 4- Staphylococcus

This woman has pre-existing chest disease and has suffered a severe bout of influenza. Staphylococcal pneumonia is known to cause cavitation, and occurs with increased frequency after influenza. As such it is the most likely cause here.

Klebsiella pneumonia occurs with increased frequency in alcoholics. This may be due to a specific deficiency in bacterial immunity related to alcohol abuse.

Flucloxacillin or IV vancomycin may be reasonable antibiotic choices in this case.



[Q: 3044] OnExamination 2012 - Respiratory

A 15-year-old girl was admitted eight hours after taking an overdose of diazepam 30 mg and methotrexate 400 mg which her mother had been prescribed for rheumatoid arthritis.

On examination her Glasgow coma score (GCS) was 10.

Which one of the following is the most appropriate immediate action?

- 1- Assess respiratory function
- 2- Perform immediate gastric lavage
- 3- Treat with activated charcoal
- 4- Treat with folinic acid
- 5- Urgent liver function tests

Answer & Comments

Answer: 1- Assess respiratory function

Her depressed GCS is due to the diazepam and the most appropriate initial treatment would be to assess her respiratory function prior to giving her folinic acid.

Methotrexate overdose is extremely rare but potentially fatal with hepatotoxicity and renal toxicity reported.

The most appropriate treatment is folinic acid (leucovorin).

It is too late to consider gastric lavage or activated charcoal.



[Q: 3045] OnExamination 2012 - Respiratory

A new publication describes a new test for cystic fibrosis.

You want to know what proportion of patients with cystic fibrosis would be correctly identified by this new test.

Which one of the following values would identify this?

- 1- Accuracy
- 2- Negative predictive value
- 3- Positive predictive value
- 4- Sensitivity
- 5- Specificity

Answer & Comments

Answer: 4- Sensitivity

The proportion of patients with the disease who would be identified by the new test is the sensitivity. This refers to the proportion with the disease who truly have cystic fibrosis and are identified as such by the test.

Positive predictive value refers to the percent of people having a positive test who actually have the disease interpreted in conjunction to the prevalence of the disease (true positives/true positives+false positives).



[Q: 3046] OnExamination 2012 - Respiratory

The morphological appearance of Pneumocystis carinii infection in the lung is best characterised as which one of the following?

- 1- A bronchopneumonia with abscess formation
- 2- A haemorrhagic and necrotising pneumonia
- 3- An acute respiratory distress syndrome (ARDS) with widespread hyaline membrane formation
- 4- An interstitial pneumonitis with foamy intra-alveolar exudate
- 5- An organising bronchopneumonia

Answer & Comments

Answer: 4- An interstitial pneumonitis with foamy intra-alveolar exudate

Pneumocystis carinii (PC) is a fungal organism.

In PC pneumonia, the organism is confined to the alveolar space of the lung and produces debris and cysts in the alveolar space with interstitial infiltration of lymphocytes and plasma cells.

As a result, it can cause profound disturbance of oxygen exchange and fatal hypoxaemia if left untreated.



[Q: 3047] OnExamination 2012 - Respiratory

A 48-year-old woman presented with shortness of breath, cough with heavy sputum production, and a low grade fever. She has smoked 20 cigarettes per day for 30 years.

Her arterial blood gases revealed:

pH 7.4 (7.36-7.44)

pCO₂ 45 mmHg (35-45)

pO₂ 78 mmHg (90-110)

What is the most likely diagnosis?

- 1- Bronchial asthma
- 2- Chronic bronchitis
- 3- Cryptogenic fibrosing alveolitis
- 4- Paraneoplastic syndrome
- 5- Pulmonary embolism

Answer & Comments

Answer: 2- Chronic bronchitis

Together with emphysema, chronic bronchitis is part of the spectrum of respiratory disease described as chronic obstructive pulmonary disease (COPD). Chronic bronchitis itself is defined as chronic cough and sputum production for at least three months of two consecutive years in the absence of other disease which could explain these symptoms.

This lady has an extensive smoking history, making her at risk of COPD, and although we are not given a timeframe for her symptoms the significant hypoxia associated with borderline hypercapnia (i.e. borderline type 2 respiratory failure) are suggestive of a diagnosis of chronic bronchitis.

If the diagnosis were bronchial asthma you would expect wheeze to be a predominant symptom. In addition, these patients typically have a low PaCO₂ secondary to hyperventilation.

Cryptogenic fibrosing alveolitis presents with a dry cough and breathlessness, and blood gas analysis typically shows type 1 respiratory failure with hypoxaemia and a normal or low pCO₂.

The symptoms of a pulmonary embolus can be varied, but the low-grade fever and productive cough make bronchitis a more likely diagnosis.

The history does not fit with a paraneoplastic syndrome.



[Q: 3048] OnExamination 2012 - Respiratory

A 23-year-old man is taking part in an expedition in the Andes and has recently ascended to above 3000 metres. Even accounting for sleeping in a small expedition tent he has a very poor night's sleep and begins to vomit profusely with a severe headache.

On examination his BP is 145/72 mmHg, pulse is 85 and regular. There are bilateral crackles on auscultation of his chest.

You are the expedition doctor and suspect he is suffering from acute altitude sickness.

Which of the following is the optimal next step?

- 1- Acetazolamide
- 2- Descent
- 3- Dexamethasone
- 4- Furosemide
- 5- Oxygen therapy

Answer & Comments

Answer: 2- Descent

The headache, nausea and vomiting is thought to relate to cerebral oedema, which occurs because of changes in cerebral blood flow at altitude. Optimal treatment is clearly to descend to lower altitude if possible. If individuals have previously suffered altitude sickness they may be able to avoid it in future by slowing the rate of ascent to altitude or treatment with acetazolamide.

Acetazolamide, dexamethasone and hyperbaric oxygen may all impact on symptoms of altitude sickness, but they are subsidiary to descent in their degree of efficacy.

Acetazolamide is preferred to loop diuretics such as furosemide.



[Q: 3049] OnExamination 2012 - Respiratory

Which one of the following statements is true of chronic obstructive pulmonary disease (COPD)?

- 1- Patients show at least a 15% improvement in the FEV₁ after nebulised bronchodilator
- 2- Inhaled corticosteroid usage does not improve long-term prognosis
- 3- Breathlessness is uncommon until the FEV₁ falls to approximately 50% of predicted
- 4- Emphysema is associated with increased transfer factor
- 5- In advanced cases there is reduced pulmonary vascular resistance

Answer & Comments

Answer: 2- Inhaled corticosteroid usage does not improve long-term prognosis

A. This level of improvement would mean the presence of asthma.

B. High dose inhaled steroids have been shown (ISOLDE) to improve quality of life and reduce hospitalisation rates by reducing the number of exacerbations, but they do not slow the rate of decline of FEV₁ (hence do not affect prognosis).

C. Breathlessness is common but subjective. Mild chronic obstructive pulmonary disease (COPD) (60-79% predicted FEV₁) is often unknown to their GP. Those with moderate COPD (40-59% predicted) are seen intermittently seen by GP, whilst those with severe disease (less than 40% predicted) have frequent hospital and GP visits.

D. It is asthma which is associated with normal or increased transfer factor. COPD is associated with decreased transfer factor.

E. COPD is associated with secondary pulmonary hypertension.



[Q: 3050] OnExamination 2012 - Respiratory

Which of the following is true of cystic fibrosis?

- 1- A sweat chloride concentration of 80 mmol/l is diagnostic
- 2- Is an autosomal dominant condition.
- 3- Is associated with mental retardation.
- 4- Is due to mutation of CFTR gene on chromosome 17
- 5- Median survival rate is 10 to 15 years.

Answer & Comments

Answer: 1- A sweat chloride concentration of 80 mmol/l is diagnostic

Cystic fibrosis is an autosomal recessive condition and is due to mutation of CFTR gene on chromosome 7.

Twenty per cent develop bronchopulmonary aspergillosis.

The median survival rate is 25 to 35 years and is currently improving.



[Q: 3051] OnExamination 2012 - Respiratory

With which of the following is obstructive sleep apnoea characteristically associated?

- 1- Hypersomnolence
- 2- Impotence
- 3- Insomnia
- 4- Macrognathia
- 5- Polydipsia

Answer & Comments

Answer: 1- Hypersomnolence

The dominant symptom is hypersomnolence (sleepiness).

Other more common symptoms include

Apparent personality changes

Witnessed apnoeas

True nocturnal polyuria.

Reduced libido is less common.

Sleep apnoea may be associated with

Acromegaly

Myxoedema

Obesity

Micrognathia/retrognathia.



[Q: 3052] OnExamination 2012 - Respiratory

A 45-year-old seaman presents with cough and fever.

A CXR demonstrates a cavitating lung lesion.

Which of the following is the most likely cause?

- 1- Amoebiasis
- 2- Brucellosis
- 3- Histoplasmosis
- 4- Sarcoidosis
- 5- Syphilis

Answer & Comments

Answer: 3- Histoplasmosis

Histoplasmosis normally evolves slowly over as long as 20 years but may follow a more rapid course in the immunocompromised (seamen may be more prone to sexually transmitted diseases such as HIV).

Amoebic abscesses can develop in the right lower lobe following transdiaphragmatic spread from amoebic liver abscess (tender hepatomegaly, malaise, spiking temperature).

Amoebiasis is also a fresh water pathogen.



[Q: 3053] OnExamination 2012 - Respiratory

A 35-year-old woman presents with a three month history of arthralgia, increasing fatigue and occasional nose bleeds. More recently she has become short of breath and has had two episodes of haemoptysis.

On investigation she is found to have acute kidney injury, with a creatinine of 656 $\mu\text{mol/L}$ and urine dipstick is positive for blood and protein. A chest x ray is performed which shows several nodules throughout both lung fields.

The treating physician suspects Wegener's granulomatosis.

Which of the below autoantibodies are most associated with this condition?

- 1- Anti-dsDNA
- 2- Anti-GBM
- 3- MPO-ANCA
- 4- p-ANCA
- 5- PR3-ANCA

Answer & Comments

Answer: 5- PR3-ANCA

Anti-neutrophil cytoplasmic antibodies (ANCA) are diagnostic markers for vasculitis, although they may not be pathological. They are characterised by neutrophil staining; cytoplasmic staining uptake (c-ANCA) and peri-nuclear (p-ANCA).

These are largely synonymous with PR3-ANCA (targeting peroxidase-3) and MPO-ANCA (targeting myeloperoxidase).

PR3-ANCA has 60-90% sensitivity and more than 90% specificity for Wegener's granulomatosis.

Churg-Strauss and microscopic polyangiitis are more commonly associated with MPO-ANCA or p-ANCA, although may be positive for PR3 ANCA also.

Goodpasture's is associated with anti-glomerular basement membrane antibody (anti-GBM).

Systemic lupus erythematosus (SLE) is associated with anti-dsDNA antibodies.



[Q: 3054] OnExamination 2012 - Respiratory

A 72-year-old man is referred to the lung cancer MDM by his respiratory physician for discussion of treatment following his recent diagnosis with stage IIIa non-small cell lung cancer (NSCLC).

According to NICE guidelines, what is the first choice treatment in eligible patients with this stage of NSCLC?

- 1- Chemotherapy
- 2- Chemotherapy and radical radiotherapy
- 3- Radical radiotherapy
- 4- Surgery
- 5- Symptomatic management including palliative RT

Answer & Comments

Answer: 2- Chemotherapy and radical radiotherapy

Sequential chemo-radiotherapy should be offered to patients with stage III NSCLC who are not suitable for surgery but are eligible for radical radiotherapy.

Surgery alone should be the first line option for patients with stage I and II provided there are no medical contraindications and they have adequate lung function.

Radical radiotherapy is indicated for patients with stage I, II or III NSCLC who have good performance status (WHO 0, 1) and whose disease can be encompassed in a radiotherapy treatment volume without undue risk of normal tissue damage.

Symptomatic treatment should be considered as the most appropriate management in patients with stage IV disease and poor WHO performance status.

The NICE guidelines are just that, and treatment decisions will be based on clinical status and performance status of the patient.

NICE guidelines.



[Q: 3055] OnExamination 2012 - Respiratory

A 65-year-old obese man presents with night time sweats, nocturia, poor concentration and day time somnolence.

To which of the following conditions does this diagnosis predispose?

- 1- Hypoglycaemia
- 2- Hypotension
- 3- Insulin sensitivity
- 4- Osteoporosis
- 5- Sudden death

Answer & Comments

Answer: 5- Sudden death

This history is typical of sleep apnoea.

Sleep apnoea is an independent risk factor for stroke (and death from all causes), and is associated with hypertension, impaired glucose tolerance (IGT), and insulin resistance.

NEJM. 2005. 353. 2070-2073



[Q: 3056] OnExamination 2012 - Respiratory

A 52-year-old woman who complains of exertional breathlessness presents to the clinic as she is desperate to stop smoking. She has had a number of unsuccessful attempts to stop smoking over the years and has tried nicotine patches.

Which of the following would be an appropriate choice to assist in her attempts at smoking cessation?

- 1- Acupuncture
- 2- Hypnotism
- 3- Nicotine gum
- 4- Nortriptyline
- 5- Varenicline

Answer & Comments

Answer: 5- Varenicline

Varenicline (Champix) is an oral anti-smoking agent with dual action, reducing the craving for cigarettes and also making the smoking of cigarettes less pleasurable. ASH, Action on Smoking and Health have released guidance on its use. It appears to be effective and safe with the main side effect being nausea.

Varenicline appears to be more effective in clinical trials than either bupropion or placebo and is prescribed for 12 weeks in the first instance with further 12 week course if craving still persists.



[Q: 3057] OnExamination 2012 - Respiratory

A 52-year-old man presented to the Emergency Unit with a two day history of increasing breathlessness, productive cough and fever. He was previously fit and well with no past history of note. He was not a cigarette smoker.

On examination he was febrile, temperature was 38.5°C, pulse rate 100/ minute and regular, blood pressure 120/80 mmHg and respiratory rate of 25 breaths/ minute.

Investigations:

Hb 15.0 g/dl (13.0-18.0)

WBC 18.5 x 10⁹/L (4-11)

Platelets 350 x 10⁹/L (150-400)

Serum sodium 137 mmol/l (137-144)

Serum potassium 4.5 mmol/l (3.5-4.9)

Serum urea 5.1 mmol/l (2.5-7.5)

Serum creatinine 110 µmol/l (60-110)

paO₂ (Arterial blood, on air) 9.0 kPa (11.3-12.6)

Chest x ray showed right middle lobe consolidation

What is the most appropriate choice of antibiotics?

- 1- Amoxicillin
- 2- Amoxicillin plus erythromycin
- 3- Ceftriaxone
- 4- Ciprofloxacin
- 5- Co-amoxiclav

Answer & Comments

Answer: 1- Amoxicillin

This gentleman has a community acquired pneumonia

Community acquired pneumonia (CAP) is defined as symptoms and signs consistent with an acute lower respiratory tract infection associated with new radiological signs consistent with consolidation, not explained by another cause.

The severity of each case of CAP should be assessed using the CURB-65 tool in conjunction with clinical judgement.

Patients score 1 point for each of:

- Confusion
- Respiratory rate > 30/min
- Blood pressure: systolic <90 or diastolic < 60 mmHg
- Age > 65 years

A CURB-65 score of 0 or 1 (as in this case) are at low risk of death, and can be treated at home if the social circumstances are compatible. A score of 2 usually indicates

inpatient treatment is required, but hospital-supervised outpatient treatment can be considered. Patients who have a CURB-65 score of 3 or more are at high risk of death. Those with scores of 4 and 5 should be considered for treatment in a critical care unit (HMU, ITU).

In the majority of patients CAP should be confirmed by chest radiography before the commencement of antibiotics. However, if patients are critically unwell they should be treated for the presumptive diagnosis. Antibiotic treatment should be initiated within 4 hours of presentation.

Low severity CAP (CURB 0-1) can be treated with amoxicillin 500mg TDS PO. CURB 2 CAP should be treated with amoxicillin 500mg-1g TDS and clarithromycin 500mg TDS. Alternatives are available if patients are allergic to any of the above combinations. High severity CAP (CURB 3-5) should be treated as soon as possible with co-amoxiclav 1.2g TDS and clarithromycin 500mg BD.

The oral route is recommended in those with low and moderate severity CAP. Patients treated with parenteral antibiotics initially should be switched to an oral regimen once clinical improvement is seen and the patients has been afebrile for at least 24 hours. For most patients with uncomplicated CAP 7 days of antibiotic treatment is recommended. For those with high severity pneumonia where an organism has not been identified, 7-10 days treatment is indicated and extended to 14-21 days where clinically needed.



[Q: 3058] OnExamination 2012 - Respiratory

A 70-year-old man presented with increasing dyspnoea.

In his history he had suffered a myocardial infarction two years previously which had been complicated by ventricular arrhythmias.

At admission his oxygen saturations were 85% on air and a chest x ray revealed bilateral patchy infiltration of both lung fields with a cardiothoracic ratio of 20/30 cm.

Which of the following drugs that he has been prescribed is most likely to explain these findings?

- 1- Amiodarone
- 2- Aspirin
- 3- Atorvastatin
- 4- Furosemide
- 5- Ramipril

Answer & Comments

Answer: 1- Amiodarone

This patient has desaturation with patchy infiltration on CXR suggesting a diagnosis of amiodarone-induced lung disease.

Usually the presentation is insidious and the disorder associated with the cumulative dose.

Treatment depends on withdrawing amiodarone and initiation of steroid therapy.

Differential diagnosis is any lymphangitis/pneumonitis but high resolution CT can help by demonstration of radio-dense plaques, etc.



[Q: 3059] OnExamination 2012 - Respiratory

A 74-year-old man is admitted to the Emergency department after collapsing in church.

On reviewing his notes you see this is the third time that it has happened in the past eight months, and each time it is when he is dressed in a suit. There is a past medical history of hypertension but nil else of note. According to a bystander his pulse seemed very slow at the time of the collapse.

On examination his BP is 135/70 mmHg, his pulse is 80 and regular. General physical review is unremarkable.

Investigations show:

Haemoglobin 13.2 g/dl (13.5-17.7)

White cell count $7.8 \times 10^9/L$ (4-11)

Platelets $282 \times 10^9/L$ (150-400)

Sodium 135 mmol/l (135-146)

Potassium 4.2 mmol/l (3.5-5)

Creatinine 123 $\mu\text{mol/l}$ (79-118)

ECG - Old inferior myocardial infarction

CXR - Unremarkable

Which of the following is the most appropriate next investigation?

- 1- Ambulatory ECG monitoring
- 2- CT head
- 3- EEG
- 4- Exercise test
- 5- Tilt table test

Answer & Comments

Answer: 1- Ambulatory ECG monitoring

The history of collapse raises the possibility of a rhythm disturbance, although the fact he collapses only when wearing his suit raises the possibility of carotid sinus hypersensitivity, with attacks related to the wearing of a tight collar. The first step when each of these diagnoses is considered is the same however, with ambulatory ECG monitoring to discharge the risk of arrhythmia.

A TIA or fit is unlikely, as his recovery period is short, and we have the collateral history of slow pulse which comes from a bystander. As such, EEG or CT head are not next step investigations.

A tilt table test is the definitive investigation for carotid sinus hypersensitivity, but would only be considered after other cardiac causes have been excluded.

Whilst myocardial ischaemia is a possibility, an exercise test would not necessarily be the next investigation of choice.



[Q: 3060] OnExamination 2012 - Respiratory

A 72-year-old lifelong smoker presents with progressive dyspnoea on exertion. He has a chronic, non-productive cough.

On examination he is thin, breathing with pursed lips, respiratory rate 25/min, with mild wheezing on chest auscultation.

Investigations show

FEV₁ 0.8 L

FVC 1.6 L

pH 7.35

paCO₂ 6kPa (45mmHg)

paO₂ 7.2kPa (55mmHg)

What is the predominant mechanism of the airflow limitation in this gentleman?

- 1- Bronchospasm
- 2- Foreign body obstruction
- 3- Increased airways resistance
- 4- Loss of elastic recoil
- 5- Mucus plugging in the small airways

Answer & Comments

Answer: 4- Loss of elastic recoil

This patient has typical features of chronic obstructive airways disease (COAD) with a predominant emphysematous element.

The pathology is centrilobular or panacinar with loss of elastic tissue.



[Q: 3061] OnExamination 2012 - Respiratory

A 65-year-old woman, has smoked 50 cigarettes a day for 40 years.

She has had increasing dyspnoea for the several years, but no cough. A chest x ray shows increased lung size along with flattening of the diaphragms, consistent with emphysema.

Over the next several years she develops worsening peripheral oedema. Her vital signs show T 36.7 C, P 80, RR 15, and BP 120/80 mm Hg.

Which of the following cardiac findings is most likely to be present?

- 1- Constrictive pericarditis
- 2- Left ventricular (LV) aneurysm
- 3- Mitral valve stenosis
- 4- Non-bacterial thrombotic endocarditis
- 5- Right ventricular hypertrophy

Answer & Comments

Answer: 5- Right ventricular hypertrophy

The most likely finding in this woman is pulmonary hypertension as a result of emphysema secondary to long term cigarette smoking.

Peripheral oedema is due to right heart dilatation and failure.

Mitral stenosis is not supported by the history.

Constrictive pericarditis could be caused by a lung malignancy in this patient, but again, there is no suggestion of this in the history.

Constrictive pericarditis would be characterised by soft heart sounds, a diastolic "pericardial knock", and gross signs of right heart failure.

LV aneurysm would lead to symptoms and signs of left heart failure and again is not the most likely finding suggested by the history.



[Q: 3062] OnExamination 2012 - Respiratory

Which of the following recognised associations is correct?

- 1- Bronchopulmonary aspergillosis and wheezing
- 2- Lung carcinoids and pleural effusion
- 3- Pneumoconiosis and clubbing
- 4- Pulmonary embolus and left bundle branch block
- 5- Pulmonary fibrosis and hypercapnia

Answer & Comments

Answer: 1- Bronchopulmonary aspergillosis and wheezing

Pulmonary fibrosis is associated with type 1 respiratory failure, which is associated with ventilation/perfusion mismatch.

Allergic bronchopulmonary aspergillosis is caused by *Aspergillus fumigatus*, which can present with asthma and eosinophilia.



[Q: 3063] OnExamination 2012 - Respiratory

A 22-year-old woman recently returned from a holiday in Malta was admitted with a three day history of fever, generalised lymphadenopathy and a macular rash over the trunk and legs.

Which of the following is the most likely diagnosis?

- 1- Actinomycosis
- 2- Familial Mediterranean fever
- 3- Infectious mononucleosis
- 4- Sarcoidosis
- 5- Tuberculosis

Answer & Comments

Answer: 3- Infectious mononucleosis

Infectious mononucleosis occurs most commonly in adolescents and young adults.

Clinical features occur after a two to five week incubation period and include:

Fever

Malaise

Pharyngitis

Lymphadenopathy.

Rashes occur more commonly in patients who have received penicillin or ampicillin.



[Q: 3064] OnExamination 2012 - Respiratory

A 67-year-old man with severe COPD managed with tiotropium, high dose Seretide and salbutamol nebulisers comes to the clinic for review. He tells you that he is increasingly short of breath and finds it very difficult to do anything at all around the house, and asks about long term oxygen therapy (LTOT).

Which of the following features would permit long term home oxygen therapy to be initiated under current NICE guidance?

- 1- FEV₁ 45% of predicted
- 2- paCO₂ 5.8kPa repeated whilst stable
- 3- paO₂ 7.1kPa repeated whilst stable
- 4- pH 7.35
- 5- Two or more exacerbations in the past year

Answer & Comments

Answer: 3- PaO₂ 7.1kPa repeated whilst stable

NICE guidance is very clear with respect to requirements for home oxygen therapy.

Offer LTOT to people with PaO₂ less than 7.3 kPa when stable, or greater than 7.3 and less than 8 kPa when stable and with secondary polycythaemia, peripheral oedema, nocturnal hypoxaemia or pulmonary hypertension.

Measurements should be repeated whilst stable at least three weeks apart.

NICE guidance does not allow home O₂ therapy based on pH, CO₂, FEV₁ or exacerbation criteria.

Apart from criteria based on PaO₂ alone, secondary features of COPD such as polycythaemia, peripheral oedema, nocturnal hypoxia or pulmonary hypertension are included.



[Q: 3065] OnExamination 2012 - Respiratory

You are reviewing use of non-invasive ventilation (NIV) by the acute medical admissions team as part of a hospital audit.

According to the latest BTS guidelines, which of the following features on history, examination or investigations would be a criterion for considering NIPPV?

- 1- pH 7.42
- 2- pCO₂ 6.5 kPa
- 3- Na 139 mmol/l
- 4- Respiratory rate 32
- 5- pO₂ 9.2 kPa

Answer & Comments

Answer: 2- pCO₂ 6.5 kPa

pH<7.35 is considered acidotic, therefore pH 7.42 is not a consideration for NIV. Hypoxia per se, and respiratory rate are not considered reasons for instigating NIV.

According to the guidelines, maximal medical therapy is:

Controlled oxygen to maintain SaO₂ 88-92%

Nebulised salbutamol 2.5-5 mg

Nebulised ipratropium 500 ?g

Prednisolone 30 mg

Antibiotic agent (when indicated).



[Q: 3066] OnExamination 2012 - Respiratory

A 57-year-old smoker presents to the Emergency department with right sided pleuritic chest pain and dyspnoea. He has no previous medical history.

His BP is 120/75 mmHg. A CXR is done and confirms a right sided pneumothorax with a rim of 2.5 cm.

What is the best plan of action?

- 1- Advise to stop smoking and discharge
- 2- Aspirate
- 3- Check arterial blood gases and only if hypoxic aspirate
- 4- Insert a chest drain
- 5- Repeat the CXR in two hours

Answer & Comments

Answer: 4- Insert a chest drain

If patient is more than 50 years of age, he is treated as for secondary pneumothorax.

Therefore age is very important: in a young person, aspiration would be the treatment of choice.

Please read the guidelines carefully:



[Q: 3067] OnExamination 2012 - Respiratory

According to current guidelines, which of the below is the recommended duration of warfarin therapy in a patient recently diagnosed with their first pulmonary embolism (PE) in the presence of temporary risk factors?

- 1- 4-6 weeks
- 2- 3 months
- 3- 6 months
- 4- 12 months
- 5- Lifelong

Answer & Comments

Answer: 1- 4-6 weeks

According to current British Thoracic Society guidelines, anticoagulation with warfarin for four to six weeks is sufficient when a PE has occurred in the presence of a temporary risk factor.

BTS recommends three months anticoagulation in a patient with their first idiopathic PE, although in America the treatment is usually extended to six months.

There is insufficient evidence, according to BTS, accurately to recommend duration of treatment in the event of recurrent venous thromboembolism (VTE) or variable risk factors, and it is often left to clinical judgement.

There is no evidence to suggest that the duration of treatment should be influenced by severity of PE or the presence of a co-existing DVT.

Management of suspected acute pulmonary embolism



[Q: 3068] OnExamination 2012 - Respiratory

A 62-year-old man with non-small cell lung cancer is being considered for surgical resection.

Which of the following would be regarded as a contraindication to surgery?

- 1- FEV₁ 1.2L
- 2- Horner's syndrome
- 3- Hypercalcaemia
- 4- Peripheral neuropathy
- 5- Previous history of myocardial infarction

Answer & Comments

Answer: 1- FEV₁ 1.2L

Non-small cell lung cancer (NSCLC) is a heterogeneous aggregate of at least three distinct histologies of lung cancer including epidermoid or squamous carcinoma, adenocarcinoma, and large cell carcinoma. These histologies are often classified together because, when localised, all have the potential for cure with surgical resection.

Resection should be performed in the absence of contraindications, namely,

Evidence of spread beyond the lung

Endobronchial location of tumour too close to the trachea, and

Other serious conditions such as poor pulmonary function.

As a general guideline, most patients with a preoperative forced expiratory volume in one second of greater than 2.5 L are able to tolerate pneumonectomy. With a forced expiratory volume in one second of less than 1.5 L, patients are not considered candidates for surgery.

Hypercalcaemia and peripheral neuropathy may be paraneoplastic phenomena and are not of themselves contraindications to surgery. Nor would a previous myocardial infarction be a contraindication to surgery.

Horner's does not signify spread beyond the chest.

The British Thoracic Society published guidelines on selection of patients for lung cancer surgery in thorax in 2001.



[Q: 3069] OnExamination 2012 - Respiratory

A 49-year-old man with a long history of alcoholism presents with cough, haemoptysis and pleuritic chest pain. He has had night sweats and 10 kg weight loss in the last three months. On chest x ray there is a subtle nodular pattern throughout the lung.

He underwent a transbronchial biopsy which showed multinucleated giant cells, epithelioid cells and necrotic debris.

Which of the following is the most likely diagnosis?

- 1- Aspergillosis
- 2- Pneumocystis carinii pneumonia
- 3- Small cell carcinoma
- 4- Squamous cell carcinoma
- 5- Tuberculosis

Answer & Comments

Answer: 5- Tuberculosis

The history, in itself, of night sweats, haemoptysis and the miliary shadowing in an alcoholic is highly suggestive of TB.

The giant cells, part of granulomas would again be supportive of TB.



[Q: 3070] OnExamination 2012 - Respiratory

A 16-year-old girl presented with acute Guillain-Barré syndrome and has developed worsening proximal muscle weakness.

Which one of the following tests should be used to monitor her respiratory function?

- 1- Arterial blood gas
- 2- Chest expansion
- 3- FEV₁/FVC ratio
- 4- Peak expiratory flow rate
- 5- Vital capacity

Answer & Comments

Answer: 5- Vital capacity

Diaphragmatic weakness occurs in one-third of patients with patients with Guillain-Barré syndrome and involvement of the neck muscles, tongue and palate leads to further respiratory compromise.

Respiratory muscle function is best monitored by frequent assessment of the vital capacity. The other investigations are of limited use.



[Q: 3071] OnExamination 2012 - Respiratory

A 35-year-old man presents after three months of chronic cough with purulent sputum and shortness of breath on exertion.

He gives a history of at least two sinus or bronchial infections per year requiring treatment with antibiotics. He also says he and his wife have been unable to have children. He smokes 15 cigarettes per day.

Examination is normal except for some wheezing and an area of focal crackles at the left lung base. Chest x ray shows patchy infiltrates at both bases.

Investigations revealed

FEV₁ 2.0 L

FVC 2.7 L

pH 7.38

paCO₂ 40 mmHg

paO₂ 82 mmHg

What is the most likely diagnosis?

- 1- Alpha-1-antitrypsin (antiprotease) deficiency
- 2- Asthma
- 3- Cystic fibrosis
- 4- Hypogammaglobulinaemia
- 5- Immotile cilia syndrome

Answer & Comments

Answer: 5- Immotile cilia syndrome

Immotile cilia syndrome, also known as primary ciliary dyskinesia and includes Kartagener's syndrome, is an inherited condition where the cilia lining the airways fail to function or function ineffectively.

A defect in the dynein molecule causes the cilia either totally to cease to function or to function ineffectively.

Kartagener's syndrome is a subset of patients that account for about half of all people with immotile cilia syndrome.

Other associated conditions of immotile cilia syndrome are

Male infertility

Congenital heart defects

Deafness

Hydrocephalus.

Cystic fibrosis is unlikely to present at this age.

Infertility is not typically associated with hypogammaglobulinaemia.



[Q: 3072] OnExamination 2012 - Respiratory

A 63-year-old woman presents with a five day history of progressive shortness of breath. Her family brought her in because she was increasingly sleepy during the last 24 hours.

She was diagnosed with chronic obstructive pulmonary disease (COPD) three years ago and has a FEV₁ less than 50% of predicted. She has an oxygen concentrator at home.

Examination revealed depressed consciousness and a respiratory rate of 24 with shallow breaths. There were decreased breath sounds with minimal air movement.

If an arterial blood gas on room air were to be performed which of the following results would you expect?

- 1- pH 7.16 paCO₂ 70 paO₂ 50 HCO₃ 24
- 2- pH 7.24 paCO₂ 80 paO₂ 55 HCO₃ 30
- 3- pH 7.32 paCO₂ 60 paO₂ 70 HCO₃ 30
- 4- pH 7.41 paCO₂ 40 paO₂ 50 HCO₃ 24
- 5- pH 7.48 paCO₂ 30 paO₂ 85 HCO₃ 24

Answer & Comments

Answer: 2- pH 7.24 paCO₂ 80 paO₂ 55 HCO₃ 30

This patient's presentation suggests that she has developed acute carbon dioxide retention and would be expected to have a low pH, low pO₂, high pCO₂ and a high HCO₃ because she has longstanding COPD.

Consequently the last three options really do not fit.

The first option has a pretty much normal bicarbonate and this would be expected to be much higher in chronic COPD (as there would be metabolic alkalosis to compensate for the respiratory acidosis). Therefore this leaves the best fit as option B.



[Q: 3073] OnExamination 2012 - Respiratory

A 20-year-old male student is assessed for shortness of breath that occurs whilst running. He has no other symptoms and does not smoke. Examination, full blood count, and chest x ray are normal.

Which of the following is most likely to be helpful in confirming the suspected diagnosis?

- 1- Arterial blood gas studies before and after exercise
- 2- Determination of lung volumes and diffusing capacity
- 3- Measurement of venous blood lactate before and after exercise
- 4- Spirometry before and after administration of bronchodilators
- 5- Spirometry before and after exercise

Answer & Comments

Answer: 5- Spirometry before and after exercise

The most likely diagnosis is exercise-induced asthma and this would be best diagnosed with

spirometry before and after exercise, where a typical obstructive pattern may be displayed following exercise.

No abnormalities may be displayed following bronchodilator therapy if it is true exercise-induced asthma. Similarly lung volumes and diffusion capacity are likely to be unaffected.

Blood gas analysis would be relatively unhelpful in this scenario as little change in partial pressures would be expected.

This patient does not have a glycogen storage disease where weakness rather than shortness of breath is more typical, hence lactate measurements are unnecessary.



[Q: 3074] OnExamination 2012 - Respiratory

Which of the following statements regarding cryptogenic fibrosing alveolitis (CFA) is correct?

- 1- Active inflammation may be suggested by a CTscan
- 2- 80% of patients initially respond well to immunosuppression
- 3- Lung volumes show a raised residual volume/total lung capacity ratio
- 4- Peak flow rate is a good guide to severity
- 5- Peak incidence seen in the fourth decade

Answer & Comments

Answer: 1- Active inflammation may be suggested by a CTscan

A. The presence of a predominantly ground glass appearance is also an independent predictor of survival.

B. About 50% of patients have an improvement in their symptoms with steroids and 25% have improved lung function.

C. Residual volume (RV) increases with airways obstruction; total lung capacity (TLC) reduces with restrictive disorders like CFA. A

raised RV/TLC ratio suggests a combination of airways obstruction and restrictive defect not just CFA as mentioned in this question.

D. Peak flow measure airway obstruction. CFA is characterised by a restrictive defect on lung function testing.

E. Peak incidence is in the sixth decade.



[Q: 3075] OnExamination 2012 - Respiratory

A 25-year-old woman is referred to the respiratory clinic as two of the children in her kindergarten class have recently been diagnosed with tuberculosis.

Clinical examination reveals a BP of 125/72 mmHg, pulse is 70 and regular. Her chest is clear. A Mantoux test results in a reaction measured at 17 mm.

Which of the following is the correct way to manage her?

- 1- Arrange for a bronchoscopy
- 2- Arrange for sputum samples to be collected
- 3- Reassure her she is immune to TB and requires no further action
- 4- Start anti-tuberculous chemotherapy
- 5- Vaccinate her with BCG

Answer & Comments

Answer: 2- Arrange for sputum samples to be collected

The Mantoux test replaced the Heaf test in 2005 in the UK. One of its uses is for patients who have had close contact with a person known to have tuberculosis.

The injection site should be reviewed 48-72 hours following intradermal inoculation of tuberculin. The left forearm is typically used. Only the induration, not surrounding erythema, is used in the measurement and the longest diameter is measured in millimetres:

- Less than 6mm: negative test, previously unvaccinated individuals can be given the BCG (within three months) provided there are no contraindications
- More than 6mm but less than 15mm: hypersensitive to tuberculin protein (may be due to previous TB infection, BCG, or atypical mycobacteria). Patients are not given the BCG if part of an immunisation programme. However, in other contexts (e.g. immigrant screening and contact tracing), further investigation should and follow-up may be indicated.
- More than 15mm: strongly hypertensive to tuberculin, suggestive of TB infection. Patients should be referred for further investigation and treatment

The reaction to tuberculin protein may be suppressed by viral infections, live viral vaccines, sarcoidosis, corticosteroids, immunosuppression, severe tuberculous disease and poor nutrition.

Bronchoscopy would not usually be considered unless other investigations have proved inconclusive.

Anti-tuberculous therapy is commenced only after infection is confirmed, and patients with a positive Mantoux do not require BCG vaccination.



[Q: 3076] OnExamination 2012 - Respiratory

A 30-year-old patient attends the hospital's asthma clinic.

She has had asthma since childhood and her control is variable. At present she is on low dose beclomethasone inhaler, and is using her salbutamol inhaler at least eight times a day. She has recently been commenced on a long acting beta 2 agonist and noticed some improvement in her symptoms.

On questioning she also reports her asthma symptoms are waking her at night once or twice a week.

On examination she is not acutely dyspnoeic and her oxygen saturations through pulse oximetry are 98% on air. She has scattered wheeze throughout her lung fields on auscultation.

Accordingly to the current British Thoracic Society guidelines what adjustments should be made to her asthma regime?

- 1- Add a leukotriene receptor antagonist
- 2- Add oral corticosteroids
- 3- Arrange admission to medical assessment unit
- 4- Increase the dose of the inhaled corticosteroid
- 5- Stop the long acting beta 2 agonist

Answer & Comments

Answer: 4- Increase the dose of the inhaled corticosteroid

According to the BTS guidelines, the patient needs adjustment in step 3 to achieve greater symptom control.

According to the guidelines a long acting B2 agonist (LABA) should be initiated first, which has already happened.

If the patient has good response to this then a LABA should be continued. If there is a partial response, then continue LABA and the increased the dose of the inhaled steroid. If there is no response to LABA, then it should be stopped, the dose of inhaled corticosteroids increased, and then possibly a trial of a leukotriene receptor antagonist or SR theophylline.

Oral corticosteroids form step 5.

BTS guidelines for asthma management can be found at:

<http://www.brit-thoracic.org.uk/Portals/0/Guidelines/AsthmaGuidelines/sign101%20Sept%202011.pdf>



[Q: 3077] OnExamination 2012 - Respiratory

Based on the current British Thoracic Society (BTS) guidelines, *which is the first line empiric antibiotic therapy regime for patients with moderate severity community acquired pneumonia (CAP) based on a CURB-65 score of 2?*

- 1- Amoxicillin 500 mg TDS
- 2- Amoxicillin 1 g TDS and clarithromycin 500 mg BD
- 3- Benzylpenicillin 1.2 g QDS and levofloxacin 500 mg BD
- 4- Co-amoxiclav 1.2 g TDS and clarithromycin 500 mg BD
- 5- Doxycycline 200 mg loading dose and then 100 mg OD

Answer & Comments

Answer: 2- Amoxicillin 1 g TDS and clarithromycin 500 mg BD

Community acquired pneumonia (CAP) is defined as symptoms and signs consistent with an acute lower respiratory tract infection associated with new radiological signs consistent with consolidation, not explained by another cause.

The severity of each case of CAP should be assessed using the CURB-65 tool in conjunction with clinical judgement. Patients score 1 point for each of:

- Confusion
- Respiratory rate > 30/min
- Blood pressure: systolic <90 or diastolic < 60 mmHg
- Age > 65years

A CURB-65 score of 0 or 1 are at low risk of death, and can be treated at home if the social circumstances are compatible. A score of 2 usually indicates inpatient treatment is required, but hospital-supervised outpatient treatment can be considered. Patients who have a CURB-65 score of 3 or more are at high risk of death. Those with scores of 4 and 5 should be considered for treatment in a critical care unit (HMU, ITU).

In the majority of patients CAP should be confirmed by chest radiography before the commencement of antibiotics. However, if patients are critically unwell they should be treated for the presumptive diagnosis. Antibiotic treatment should be initiated within 4 hours of presentation.

Low severity CAP (CURB 0-1) can be treated with amoxicillin 500mg TDS PO. CURB 2 CAP should be treated with amoxicillin 500mg-1g TDS and clarithromycin 500mg TDS. Alternatives are available if patients are allergic to any of the above combinations. High severity CAP (CURB 3-5) should be treated as soon as possible with co-amoxiclav 1.2g TDS and clarithromycin 500mg BD.

The oral route is recommended in those with low and moderate severity CAP. Patients treated with parenteral antibiotics initially should be switched to an oral regimen once clinical improvement is seen and the patients has been afebrile for at least 24 hours. For most patients with uncomplicated CAP 7 days of antibiotic treatment is recommended. For those with high severity pneumonia where an organism has not been identified, 7-10 days treatment is indicated and extended to 14-21 days where clinically needed.



[Q: 3078] OnExamination 2012 - Respiratory

A 21-year-old woman presents to the Emergency department with a one hour history of shortness of breath, and chest tightness.

The symptoms occurred acutely, and she has suffered identical attacks previously which are increasing in frequency.

Her GP has treated her with a salbutamol inhaler, although she has not had any formal pulmonary function testing. Usage of her salbutamol inhaler has not helped her shortness of breath.

On examination she is distressed and chest examination shows vesicular breath sounds with an elevated respiratory rate. Oxygen saturation is 98% on air which is sustained on exertion.

Chest x ray is normal and arterial blood gas analysis shows:

pH 7.52 (7.35-7.45)

pCO₂ 2.2 kPa(4.7-7.45)

pO₂ 18 kPa (increased from 15)(10.0-13.0)

HCO₃ 25(22.0 - 30.0)

Which of the following would be your diagnosis?

- 1- Acute asthma attack (mild)
- 2- Hyperventilation (psychogenic)
- 3- Pulmonary embolism
- 4- Respiratory muscle disease
- 5- Volume depletion

Answer & Comments

Answer: 2- Hyperventilation (psychogenic)

This patient's blood gas sample shows a respiratory alkalosis, as demonstrated by the raised pH, low pCO₂ and normal bicarbonate.

The most likely cause therefore is hyperventilation, possibly due to high levels of anxiety.

Other causes include pain, altitude and excessive mechanical ventilation.

In acute asthma, the pCO₂ may be low, as the patient has an elevated respiratory rate, however in this instance there should be a

history of the condition, clinical signs or a reduced pO₂.

Pulmonary embolism can also present similarly, but in the absence of any disclosed risk factors, a normal pO₂ and oxygen saturations maintained on exertion, this becomes less likely.

Respiratory muscle disease typically results in a respiratory acidosis.

Volume depletion (from a number of causes) would typically cause a metabolic alkalosis.



[Q: 3079] OnExamination 2012 - Respiratory

A 42-year-old man presented to his GP with increasing shortness of breath.

He has been previously noted to have a raised ALT, which was put down by the GP to a problem with excessive drinking. He was given a salbutamol inhaler which brought about some relief, particularly when he was playing football with his friends, but most recently he has had to give up due to reduced exercise tolerance.

On examination his BP is 142/82 mmHg. He is thin with a BMI of 19 kg/m², and his chest looks hyper-expanded. There is scattered wheeze throughout both lung fields. Abdominal examination is normal.

Investigations show

Hb 12.9 g/dl(13.5-18)

WCC 8.1 x 10⁹/L (4-10)

PLT 203 x 10⁹/L (150-400)

Na 138 mmol/l (134-143)

K 4.4 mmol/l (3.5-5)

Cr 110 µmol/l (60-120)

FEV₁ 70% of predicted

FEV₁/FVC60% of predicted

Which of the following is the most likely diagnosis?

- 1- Alpha-1 antitrypsin deficiency
- 2- Asthma
- 3- Chronic bronchitis
- 4- Idiopathic pulmonary fibrosis
- 5- Primary biliary cirrhosis

Answer & Comments

Answer: 1- Alpha-1 antitrypsin deficiency

This man's abnormal alanine aminotransferase (ALT) raises the possibility of accelerated liver disease, characterised by accelerated hepatic fibrosis/cirrhosis as a result of alpha-1 antitrypsin deficiency.

Additionally, his lung function tests fit the diagnosis of chronic obstructive pulmonary disease (COPD). As such, emphysema is the most likely underlying respiratory diagnosis. It is likely that he has the PiMS, PiMZ or PiSS genotype.

Replacement alpha-1 antitrypsin is available, although its cost effectiveness and long term clinical effectiveness is yet to be established.



[Q: 3080] OnExamination 2012 - Respiratory

A 31-year-old female with pulmonary hypertension complains of increasing shortness of breath. She is 36 weeks gestation in her first pregnancy.

Which of the following statements is correct?

- 1- Chest x ray is contraindicated
- 2- Elevated D-dimers rule out PE
- 3- Enoxaparin dose should be halved in pregnancy
- 4- Nifedipine is contraindicated in pregnancy
- 5- Risk of maternal mortality in patients with pulmonary hypertension is 30%

Answer & Comments

Answer: 5- Risk of maternal mortality in patients with pulmonary hypertension is 30%

A chest x ray is not contraindicated in pregnancy.

Any pregnant female presenting with shortness of breath should be reviewed by a senior member of the obstetric team, advice which comes from the RCOG.

Enoxaparin dose should be doubled in pregnancy, due to the increased glomerular filtration rate (GFR) in pregnancy.

D-dimers are always elevated in pregnancy, and are not helpful as a diagnostic aid, unless of course they are low (very unlikely), thereby making the clinical suspicion of pulmonary embolism (PE) low.

Nifedipine is not contraindicated in pregnancy, but should be used judiciously.

Labetalol and methyldopa are the commonest antihypertensives used in pregnancy.

Patients with pulmonary hypertension have a high mortality of at least 30% - some authors put it at 50% - seemingly highest immediately after delivery.



[Q: 3081] OnExamination 2012 - Respiratory

A 42-year-old restaurateur who has been human immunodeficiency virus (HIV) positive for eight years presents with progressive shortness of breath on exercise.

The chest x ray shows normal lung fields with prominent pulmonary arteries. Pulse oximetry demonstrates that he desaturates on exercise.

Which is the most likely diagnosis?

- 1- Anaemia
- 2- Intracardiac shunt across an atrial septal defect
- 3- Pneumocystis jiroveci pneumonia (PCP)

4- Primary pulmonary hypertension

5- Pulmonary embolic disease

Answer & Comments

Answer: 3- Pneumocystis jiroveci pneumonia (PCP)

The history of dyspnoea and desaturation on exercise in an HIV-positive patient would suggest PCP.

Pneumocystis jiroveci is a eukaryotic microorganism. In immunosuppressed patients it can cause a pneumonia, which is most recognised in patients with AIDS but can also be seen in those with organ transplants or when undergoing chemotherapy. A CD4 count of less than 200 is associated with significant risk. In Europe, the USA and Australia P. jiroveci pneumonia in HIV-positive patients is seen largely in those unaware of their HIV status. Unfortunately it is a major cause of death in Africa, especially in children. Previously it was thought that disease was caused by reactivation of latent infection acquired in childhood, but de novo infection is increasingly recognised.

The pneumonia caused by P. jiroveci is potentially severe and fatal in immunosuppressed patients. Clinically it presents with several weeks' history of dry cough, fever and dyspnoea. Examination findings are often subtle, but include tachypnoea, tachycardia, cyanosis and fine respiratory crackles. Typically, patients desaturate markedly on exertion. There may be reduced transfer factor, vital capacity and total lung capacity on spirometry. Bronchoalveolar lavage or induced sputum can be used to demonstrate the organism (open lung biopsy is gold standard, but rarely performed in clinical practice). Giemsa, Papanicolaou and Grocott's stains are used.

There are a variety of different chest radiograph findings. Typically it causes bilateral symmetrical perihilar reticular or

granular interstitial shadowing. Less often there can be asymmetric shadowing, or progression to a reticular-alveolar pattern. Occasionally lobar consolidation, nodular lesions, prominent pulmonary arteries, pneumothorax, pneumomediastinum, cysts or pneumatocoles can be seen. In patients who have been on prophylactic inhaled pentamidine the infiltrates may predominantly affect the upper lobes. A normal chest x-ray does not exclude the diagnosis. Pleural effusions and lymphadenopathy are not typical, but be aware of the possibility of multiple disease processes in an immunosuppressed patient.

If allowed to progress, P.jiroveci can disseminate via the lymphatic and haematogenous routes to affect the thyroid, liver, bone marrow, lymph nodes and spleen.

If PCP is suspected, treatment with full dose co-trimoxazole should be started as soon as possible. It should be given for 21 days in HIV-positive cases, but shorter doses can be used in other causes of immunosuppression. In patients who are intolerant or co-trimoxazole, intravenous pentamidine can be used. Some studies have shown that that corticosteroids can reduce the risk of respiratory failure, and they are therefore used in some cases.

Prophylaxis should be used in immunosuppressed patients who are at risk of developing PCP: all those with a CD4 count of <200, patients started on high dose steroids, and those on chemotherapeutic regimens associated with significant immunosuppression. Co-trimoxazole is also the first line prophylactic agent.

Pulmonary hypertension does develop with increased frequency in patients with HIV, but this is secondary rather than primary. Primary pulmonary hypertension is rare, and more commonly affects females.

Anaemia is a possibility, but the chest x-ray findings and history of HIV make PCP more likely.

Atrial septal defects with intracardiac shunting can eventually lead to hypoxia (Eisenmenger syndrome), but this is less likely than PCP in patients known to be HIV-positive.

This history may also be consistent with multiple small pulmonary emboli, but again this is less likely than PCP in an HIV-positive patient.



[Q: 3082] OnExamination 2012 - Respiratory

A 62-year-old man is found to have squamous cell carcinoma of the lung after being investigated for haemoptysis.

Which one of the following would be a contraindication to surgical resection?

- 1- Finger clubbing
- 2- Hypercalcaemia
- 3- Hypertrophic pulmonary osteoarthropathy
- 4- Pleural effusion
- 5- Superior vena cava obstruction

Answer & Comments

Answer: 5- Superior vena cava obstruction

Superior vena cava obstruction (SVCO) interrupts venous return from the head, arms and thorax to the right atrium resulting in facial swelling, stridor, cough, breathlessness, hoarseness, headache, etc. It was first described by William Hunter in 1757 in a case of syphilitic aortic aneurysm but these days the commonest cause is malignancy and in particular bronchial carcinoma and lymphoma.

Treatment is of the underlying condition, chemotherapy for small cell lung cancer and lymphoma and radiotherapy for non-small cell lung cancer. Sometimes patients require

stenting of the SVCO for symptomatic relief prior to more definitive treatment.

Pleural effusions are a contraindication to surgery if they are malignant but effusions in patients with bronchial carcinoma may be reactive.

Absolute contraindications for surgery include:

- Patient refusal
- Metastases

Relative contraindications include:

- Cell type: small cell carcinoma are usually inoperable
- Poor respiratory reserve: $FEV_1 > 1.2l$ is necessary for lobectomy, and $> 1.8l$ for pneumonectomy
- Raised $PaCO_2$ is a contraindication for surgery
- Other disease - especially myocardial
- Mediastinal involvement
- Age - in patients over 70, surgery is usually inadvisable because the benefits are outweighed by operative morbidity and mortality



[Q: 3083] OnExamination 2012 - Respiratory

A 70-year-old male presents with haemoptysis.

Bronchoscopy reveals a tumour in the proximal right main bronchus.

Which of the following is a contraindication to radical radiotherapy?

- 1- Adenocarcinoma
- 2- FEV_1 of 25% predicted
- 3- Involvement of the pulmonary artery
- 4- Ischaemic heart disease
- 5- Superior vena caval obstruction

Answer & Comments

Answer: 2- FEV₁ of 25% predicted

Patients with potentially operable tumours that are either too unfit for surgery or refuse surgery may be suitable for radical radiotherapy, that is, radiotherapy with intention to cure using doses of at least 60 Gy.

Using continuous hyperfractionated accelerated radiotherapy (CHART) can improve two year survival significantly from 20% to 29% compared with conventional radiotherapy (Saunders M et al. Lancet 1997 350: 161-165).

Contraindications are tumours larger than 4 cm and poor pulmonary function (generally taken as FEV₁ less than 50% predicted).



[Q: 3084] OnExamination 2012 - Respiratory

A 36-year-old woman presents with dyspnoea, cough and fever.

Crackles are heard on auscultation of the lungs. Circulating precipitans to *Micropolyspora faeni* are positive.

Which of the following is the most likely diagnosis?

- 1- Allergic bronchopulmonary aspergillosis
- 2- Brucellosis
- 3- Farmer's lung
- 4- Malt worker's lung
- 5- Pigeon fancier's lung

Answer & Comments

Answer: 3- Farmer's lung

Spores of *Micropolyspora faeni* found in moldy hay/straw are responsible for farmer's lung.



[Q: 3085] OnExamination 2012 - Respiratory

A 40-year-old worker presents with wheezing and breathlessness which seem to improve over weekends and holiday periods when he is not working.

To which of the following is he most likely to be exposed at work?

- 1- *Aspergillus clavatus*
- 2- Avian bloom
- 3- Exposure to spores of *Actinomyces*
- 4- Platinum salts
- 5- Work in the silver industry

Answer & Comments

Answer: 4- Platinum salts

Disinfectants and preservatives including

Glutaraldehyde

Chlorhexidine and

Formaldehyde

can cause occupational asthma.

Metals causing occupational asthma include

Isocyanate cobalt

Aluminium

Chrome

Manganese

Nickel

Zinc and

Platinum.

Exposure to

Actinomyces (farmer's lung, mushroom worker's lung)

Avian bloom (bird fancier's lung) and

Aspergillus clavatus (malt worker's lung)

cause extrinsic allergic alveolitis.



[Q: 3086] OnExamination 2012 - Respiratory

A 28-year-old man who works on a local mushroom farm comes to the clinic with increased shortness of breath. In addition to feeling increasingly short of breath, he has suffered intermittent fevers and sweats over the past few months.

On examination his BP is 135/72 mmHg, pulse is 72 and regular. There are fine inspiratory crackles at both bases on auscultation of his chest.

Investigations show:

Haemoglobin 13.5 g/dl(13.5-17.7)

White cell count $9.3 \times 10^9/L$ (4-11)

Platelets $204 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 4.3 mmol/l (3.5-5)

Creatinine 116 $\mu\text{mol/l}$ (79-118)

CXR - Diffuse interstitial shadowing.

Spirometry - mixed restrictive / obstructive picture.

Which of the following is the most appropriate course of action for the longer term?

- 1- Change of job plan
- 2- Inhaled anticholinergics
- 3- Inhaled high dose Seretide
- 4- Oral prednisolone
- 5- Regular azithromycin

Answer & Comments

Answer: 1- Change of job plan

This man's occupation as a mushroom picker raises the possibility of mushroom picker's lung, a form of extrinsic allergic alveolitis. Optimal management is removal of exposure to the antigen, although in the short term a

course of oral corticosteroids is likely to be appropriate.

Inhaled anticholinergics are used in the management of chronic obstructive pulmonary disease (COPD) and are therefore not appropriate here.

Inhaled corticosteroids are not as effective as oral corticosteroids in managing subacute or chronic extrinsic allergic alveolitis, so oral prednisolone is the treatment of choice after removal of exposure to the antigen has occurred.

There is no role for antibiotic therapy.



[Q: 3087] OnExamination 2012 - Respiratory

A 22-year-old woman is brought to the Emergency room by her boyfriend. She has been suffering from a heavy cold over the past few days and now has worsening wheeze and a dry cough.

There is a past history of asthma for which she takes high dose Seretide and salbutamol prn.

On examination her BP is 135/72 mmHg, her pulse is 95 and regular. She has severe wheeze on auscultation of the chest and her respiratory rate is 34/ min.

Investigations show:

pH 7.42(7.35-7.45)

pCO₂ 4.5 kPa(4.8-6.1)

pO₂ 12.9 kPa(10-13.3)

PEFR 170ml / min (32% of predicted)

Which of the following features in her presentation is consistent with life - threatening asthma?

- 1- pH 7.42
- 2- pO₂ 12.9 kPa
- 3- pCO₂ 4.5 kPa
- 4- Peak flow 170 ml/min
- 5- Respiratory rate 34/min

Answer & Comments

Answer: 4- Peak flow 170 ml/min

Peak flow less than 33% predicted is recognised as being a feature of life-threatening asthma. Other features listed in the BTS asthma guidelines include:

SpO₂ <92%

PaO₂ <8 kPa

Normal PaCO₂ (4.6-6.0 kPa)

Silent chest

Cyanosis

Poor respiratory effort

Arrhythmia

Exhaustion

Altered conscious level.

The pH and O₂ are both in the normal range and as such are not features consistent with life-threatening asthma.

The CO₂ is slightly below the normal range, which is as expected and consistent with increased respiratory effort.

Respiratory rate >25 is a feature consistent with acute severe asthma.



[Q: 3088] OnExamination 2012 - Respiratory

A 42-year-old rough sleeper is admitted from the local park where he has been found collapsed after drinking a flask of amyl nitrate.

On examination his skin is blue grey in colour, his pulse is 100 and regular, and his BP is 105/60 mmHg. He is unconscious, respiratory examination is unremarkable apart from an increased respiratory rate of 31. The pulse oximeter reads 90%.

Which of the following is the most appropriate treatment?

1- Ascorbic acid

2- Cimetidine

3- Hyperbaric oxygen

4- Methylene blue

5- Omeprazole

Answer & Comments

Answer: 4- Methylene blue

Amyl nitrate is known to lead to oxidation of haemoglobin, particularly when ingested in large quantities.

The presentation seen here is typical of that for methaemoglobinemia, when oxidation of the Fe²⁺ component of haemoglobin to Fe³⁺ leads to a significant left shift in the oxygen dissociation curve. Methylene blue is the initial treatment of choice for methaemoglobinemia.

Ascorbic acid may be considered as a second line therapy to reduce cyanosis in methaemoglobinemia although some debate exists as to its efficacy.

Cimetidine can be used to inhibit metabolism of agents such as dapsone which are known to lead to methaemoglobinemia.

Hyperbaric oxygen is used for cases which are resistant to initial medical therapy.

Omeprazole is not thought to have a role in the treatment of the condition.



[Q: 3089] OnExamination 2012 - Respiratory

You are examining rates of *Aspergillus* positive sputum samples received at the hospital as part of an audit.

*With respect to increasing the positive test rate, which of the following is most likely to be associated with *Aspergillus* colonisation?*

1- Asthma

2- Bronchial carcinoma

3- COPD

4- Cystic fibrosis

5- HIV

Answer & Comments

Answer: 4- Cystic fibrosis

Allergic bronchopulmonary aspergillosis (ABPA) rates are lower in patients with obstructive lung disease at around 1%.

HIV patients with a known history of *P. jirovecii* are at increased risk of aspergilloma.

Bronchial carcinoma is not particularly associated with aspergillus positivity.



[Q: 3090] OnExamination 2012 - Respiratory

A 70-year-old lady with a significant smoking history is referred to the rapid access chest clinic with a three month history of weight loss, a cough and three episodes of haemoptysis. She is otherwise fit and well.

On questioning she has a troublesome cough, some mild right sided chest pain which she describes as an ache and finds she gets fatigued more easily. However she is still able to complete the majority of her usual tasks unaided, although she finds these take her longer than before.

According to the World Health Organisation (WHO) classification, what is her performance status?

1- 0

2- 1

3- 2

4- 3

5- 4

Answer & Comments

Answer: 2- 1

WHO (Zubrod) Scale Description

0 Asymptomatic

1 Symptomatic but ambulatory (can carry out light work)

2 In bed less than 50% of the day. Unable to work but can live at home with some assistance

3 In bed more than 50% of the day (unable to care for self)

4 Bedridden.

As taken from NICE lung cancer guidelines



[Q: 3091] OnExamination 2012 - Respiratory

A 48-year-old man with a history of cirrhosis comes to the respiratory clinic for a consultation because of increased shortness of breath. He smokes 10 cigarettes per day and has done so since the age of 17.

Medication of note includes propranolol, but nil else of note. On examination his BP is 112/70 mmHg, pulse is 62 and regular. Apart from signs of chronic liver disease, you also notice that he has scattered wheeze throughout both lung fields.

Investigations show:

Haemoglobin 12.9 g/dl (13.5-8)

White cell count $5.7 \times 10^9/L$ (4-10)

Platelets $203 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (134-143)

Potassium 4.8 mmol/l (3.5-5)

Creatinine 110 $\mu\text{mol/l}$ (60-120)

Chest x ray Evidence of hyperexpanded lung fields

Pulmonary function tests FEV_1 55% of predicted

FVC 90% of predicted

Reduced KCO

Which of the following is the most likely diagnosis?

- 1- Asthma
- 2- Chronic bronchitis
- 3- Emphysema
- 4- Hypoventilation
- 5- Pulmonary fibrosis

Answer & Comments

Answer: 3- Emphysema

This man has hyperexpanded lung fields on CXR, reduced transfer factor and an FEV₁/FVC of 61%.

Despite smoking a relatively small number of cigarettes he has significant chronic obstructive pulmonary disease (COPD) on pulmonary function tests; the reduced transfer factor and CXR appearance pointing towards a predominantly emphysematous picture.

The fact that he has cirrhosis raises the possibility of alpha-1 antitrypsin deficiency as the underlying diagnosis.



[Q: 3092] OnExamination 2012 - Respiratory

What is the most likely cause of upper lobe fibrosis on chest x ray?

- 1- Ankylosing spondylitis
- 2- Cryptogenic fibrosing alveolitis
- 3- Rheumatoid arthritis
- 4- Scleroderma
- 5- Systemic lupus erythematosus

Answer & Comments

Answer: 1- Ankylosing spondylitis

Cryptogenic fibrosing alveolitis (which may be associated with connective tissue disorders) affects lower lobes and is associated with clubbing.

Extrinsic allergic alveolitis is not associated with clubbing and affects middle/upper zones.



[Q: 3093] OnExamination 2012 - Respiratory

A 16-year-old girl presents with shortness of breath and insomnia prior to an examination.

Clinical examination is normal. CXR and PEFr are normal.

Which of the following investigations is most suggestive of asthma?

- 1- Diurnal variation in PEFr >20%
- 2- Increased total IgE
- 3- Past medical history of hay fever and eczema
- 4- Positive skin prick test to common allergens
- 5- Resolution of symptoms the day after the examination

Answer & Comments

Answer: 1- Diurnal variation in PEFr >20%

The history of atopy in this patient is consistent with a diagnosis of asthma.

IgE being elevated really tells you little, other than suggesting atopy and the skin prick would suggest allergy.

The resolution of symptoms after the examination suggests anxiety.

However, diurnal variation of peak expiratory flow rate (PEFR) greater than 20% is one of the diagnostic criteria for asthma, and this is the most appropriate answer in this case.



[Q: 3094] OnExamination 2012 - Respiratory

An 18-year-old female presents with an acute exacerbation of asthma associated with a chest infection. She is unable to complete a sentence and her peak flow rate was 35% of her normal level.

She is treated with high flow oxygen, nebulised bronchodilators and oral steroids but this is associated with little change in her condition.

Which of the following treatments, given intravenously, would be the most appropriate for this patient?

- 1- Aminophylline
- 2- Augmentin
- 3- Hydrocortisone
- 4- Magnesium
- 5- Salbutamol

Answer & Comments

Answer: 4- Magnesium

This patient has acute severe asthma (PEFR 33-50% predicted/best, unable to complete sentences in one breath, respiratory rate >25 breaths/min, pulse rate >110 beats/minute).

She has not responded to initial treatment and the treatment of choice now is intravenous magnesium 1.2-2 g over 20 minutes.

Reference:

*BTS guidelines on the Management of Asthma
British Thoracic Society
British Guideline on the Management of Asthma
(Guideline 101) Scottish Intercollegiate
Guidelines Network*



[Q: 3095] OnExamination 2012 - Respiratory

An 80-year-old coal miner who stopped working 16 years previously presents with deteriorating dyspnoea.

Investigations show:

FEV 11.4 L (predicted 2.5)

FVC 2.8L (predicted 3.0)

What is the most likely diagnosis?

- 1- Chronic obstructive pulmonary disease

- 2- Cryptogenic fibrosing alveolitis
- 3- Extrinsic allergic alveolitis
- 4- Silicosis
- 5- Simple pneumoconiosis

Answer & Comments

Answer: 1- Chronic obstructive pulmonary disease

Both this man's forced expiratory volume in one second (FEV₁) and forced vital capacity (FVC) are reduced. The ratio of FEV₁/FVC is also reduced at 50%. This indicates airways obstruction.

Chronic obstructive pulmonary disease (COPD) is the only condition above that results in airways obstruction.

Although no smoking history is given this may be expected and with his occupation these are risk factors for the development of COPD.



[Q: 3096] OnExamination 2012 - Respiratory

In which of the following cases of lung cancer would surgical resection of the tumour be a reasonable therapeutic option?

- 1- A 56-year-old woman with an adenocarcinoma of the right lung. CT scan shows enlarged lymph nodes in the right and left hilum. PFTs show an FEV₁ of 2.25 L. (55% predicted).
- 2- A 59-year-old man who is found at bronchoscopy to have a tumour in the right mainstem bronchus extending to within 1 cm of the carina. Pulmonary function tests (PFTs) show an FEV₁ of 2.1 litres (65% of predicted normal).
- 3- A 62-year-old lady with a small peripheral mass who has elevated liver enzymes and a computed tomography (CT) scan showing probable metastatic deposits in the liver. Lung function tests show an FEV₁ of 3.5 litres (80% of predicted normal).

- 4- A 70-year-old man with a right lower lobe tumour 2 cm in diameter with no evidence of regional adenopathy or distant spread of disease. Lung function studies show an FEV₁ of 0.8 litres (28% predicted).
- 5- A 71-year-old man with a 3 cm tumour obstructing the right lower lobe bronchus. Lung function tests show an FEV₁ of 2.1 L. (60% predicted).

Answer & Comments

Answer: 5- A 71-year-old man with a 3 cm tumour obstructing the right lower lobe bronchus. Lung function tests show an FEV₁ of 2.1 L. (60% predicted).

Surgical resection of a lung tumour may be expected to have increased success with limitation of disease spread.

In the first case with hilar LAP and reduced lung function surgery would be futile.

In the second case the tumour is too close to the bifurcation of the bronchi to permit resection.

The third case has metastatic disease and would clearly be unsuitable for surgery. Generally a positron emission tomography (PET) scan would confirm this.

The fourth case has a tumour that would be potentially resectable but lung function is too poor.

The final case has a tumour that would be suitable for resection and has good lung function.



[Q: 3097] OnExamination 2012 - Respiratory

Which of the following statements is true of the diffusion capacity of carbon monoxide?

- 1- Depends on the thickness of the alveolar wall.
- 2- Is a specific measure of lung perfusion.

- 3- Is increased in cigarette smokers.
- 4- Is increased in emphysema.
- 5- Is not affected by changes in the surface area available for gas exchange.

Answer & Comments

Answer: 1- Depends on the thickness of the alveolar wall.

By Fick's law, the volume of gas diffusing across a membrane equals $A/T \times D \times$ difference in partial pressure.

In life it is impossible to measure accurately the area (A) or the thickness (T), and these are subsumed into a single constant, the diffusion capacity for carbon monoxide.

DL = volume of transferred carbon dioxide divided by partial pressure difference between the alveoli and the capillary blood. Since the capillary blood normally does not contain carbon dioxide this term disappears.

Diffusion will be increased in healthy compared with unhealthy lungs, where the thickness is likely to increase and the surface area available for gas exchange to decrease.

VQ imbalances can indirectly interfere with carbon dioxide diffusion capacity by decreasing the available area of lung for gas exchange, but it is not a specific measure of lung perfusion.



[Q: 3098] OnExamination 2012 - Respiratory

A 25-year-old woman is admitted with a four month history of cough productive of mucoid sputum streaked with bright red blood, wheezing and diarrhoea.

Her chest and abdominal examination are normal.

Which of the following investigations is the most discriminatory?

- 1- Bronchoscopy

- 2- Chest x ray
- 3- Computed tomography (CT) of chest
- 4- Echocardiogram
- 5- Ventilation-perfusion scan

Answer & Comments

Answer: 1- Bronchoscopy

Bronchial carcinoid is a highly vascular 'cherry-like' tumour causing recurrent haemoptysis and bronchial obstruction.

It may rarely produce the classical symptoms of carcinoid syndrome such as cyanotic flushings, intestinal cramps and diarrhoea following liver metastases in 5% cases.

Bronchoscopy identifies up to 80% of carcinoid tumours in the main bronchi.

Biopsy is usually followed with brisk bleeding and should be done via rigid bronchoscopy.



[Q: 3099] OnExamination 2012 - Respiratory

A 41-year-old man with a history of nasal congestion, breathlessness, cough and wheeze presents with a left foot drop.

Which of the following is the most likely diagnosis?

- 1- Churg-Strauss syndrome
- 2- Diabetes mellitus
- 3- Polyarteritis nodosa
- 4- Pulmonary eosinophilia
- 5- Wegener's granulomatosis

Answer & Comments

Answer: 1- Churg-Strauss syndrome

Churg-Strauss syndrome (CSS) is a rare form of small-vessel vasculitis, characterised by asthma, allergic rhinitis and prominent peripheral blood eosinophilia. Rarely, it can cause either an anterior or a posterior

ischaemic optic neuropathy, which presents with visual loss.

The most commonly involved organ is the lung, followed by the skin. CSS, however, can affect any organ system, including the cardiovascular, gastrointestinal, renal, and central nervous systems. The unifying feature of patients presenting with CSS is asthma. Vasculitis involving the peripheral nervous system is also a characteristic feature, and mononeuritis multiplex occurs in 75% of patients, which accounts for the foot drop in this case.

Vasculitis of extrapulmonary organs is largely responsible for the morbidity and mortality associated with CSS. 40-60% are associated with positive ANCA, usually pANCA/MPO.

Intravenous glucocorticoid is used for initial therapy of acute multi-organ disease, followed by oral glucocorticoid therapy, often with azathioprine as a steroid-sparing agent. Loss of vision must be treated aggressively.

Wegener's granulomatosis is a multi-organ autoimmune disease, which can be fatal. The classical triad consists of necrotising granulomatous inflammation of the respiratory tract, glomerulonephritis and a small-vessel vasculitis. A prolonged history of epistaxis or sinusitis is commonly found in Wegener's granulomatosis, which in some patients is also associated with an eosinophilia.

Hypereosinophilic syndrome is characterised by a peripheral blood eosinophil count of >1.5 for more than 6 months. Generalised symptoms are fatigue, myalgia, fever, night sweats, diarrhoea and pruritis. Other symptoms depend on the organ involved: cardiac disease causes chest pain and dyspnoea, respiratory disease presents with a dry cough.

Diabetes mellitus can cause a mononeuritis multiplex (and therefore a foot drop),

however the other features do not fit with this diagnosis.

Polyarteritis nodosa is a vasculitis which affects medium and small arteries, resulting in microaneurysms, aneurysmal rupture, thrombosis and subsequently organ ischaemia and infarction. It most commonly affects skin, joints, peripheral nerves, the gastrointestinal tract and the kidney. The lungs are usually spared. A typical presentation is with fever, night sweats, weight loss, skin ulceration and tender nodules, and severe muscle and joint pains.



[Q: 3100] OnExamination 2012 - Respiratory

A patient with rheumatoid arthritis complains of progressive breathlessness.

Which of the following is the most likely cause?

- 1- Asthma
- 2- Fibrosing alveolitis
- 3- Pulmonary embolus
- 4- Pulmonary eosinophilia
- 5- Pulmonary nodules

Answer & Comments

Answer: 2- Fibrosing alveolitis

Fibrosing alveolitis associated with rheumatoid arthritis is indistinguishable from cryptogenic fibrosing alveolitis. It presents with progressive breathlessness and cough.

Signs include

Finger clubbing

Cyanosis

Bilateral end inspiratory crackles.

Other pulmonary complications of rheumatoid arthritis include

Pleural effusions

Empyema

Cryptogenic organising pneumonia

Bronchiectasis

Pulmonary nodules.

The latter are usually asymptomatic but may cavitate, resulting in haemoptysis, and when occurring with coal workers pneumoconiosis (Caplan's syndrome) are associated with breathlessness.



[Q: 3101] OnExamination 2012 - Respiratory

A patient who is listed for excision of his operable squamous cell lung cancer, suffers a life threatening haemoptysis on the ward.

Which of the following is the most appropriate treatment?

- 1- Antibiotics
- 2- Bronchial embolisation
- 3- Conservative care
- 4- Radiotherapy
- 5- Tranexamic acid

Answer & Comments

Answer: 2- Bronchial embolisation

Life threatening haemoptysis is a medical emergency that requires prompt action.

Pulmonary angiography will identify the blood supply to the tumour and embolisation of this vessel(s) will immediately stem the bleeding.

The other options are also important in the long term management.

Antibiotics are used to prevent secondary bacterial infection.



[Q: 3102] OnExamination 2012 - Respiratory

Which is the most likely explanation for the high prevalence of cystic fibrosis in European populations?

- 1- Heterozygotes may have an advantage because of increased resistance to cholera.
- 2- Inbreeding is common among Europeans.
- 3- Many different mutations can cause cystic fibrosis.
- 4- Most of the disease genes are hidden in heterozygotes.
- 5- The locus has a high mutation rate.

Answer & Comments

Answer: 1- Heterozygotes may have an advantage because of increased resistance to cholera.

The prevalence of the cystic fibrosis gene at around 1 in 20 of the population would suggest that this provides some evolutionary survival advantage. Like sickle cell trait offering a survival advantage to malaria, it is believed that the cystic fibrosis gene offers a possible survival advantage against cholera and enteropathogenic bacteria.

"Cholera opens chloride channels, letting chloride and water leave cells. The CFTR protein does just the opposite, closing chloride channels and trapping salt and water in cells, which dries out mucus and other secretions. A person with CF cannot contract cholera, because the toxin cannot open the chloride channels in the small intestine.

Carriers of CF enjoy the mixed blessing of a balanced polymorphism. They do not have enough abnormal chloride channels to cause the labored breathing and clogged pancreas of cystic fibrosis, but they do have enough of a defect to prevent the cholera from taking hold. During the devastating cholera epidemics that have peppered history, individuals carrying mutant CF alleles had a

selective advantage, and they disproportionately transmitted those alleles to future generations. However, because CF arose in Western Europe and cholera in Africa, perhaps an initial increase in CF heterozygosity was a response to a different diarrheal infection." (Read more about balanced polymorphism).



[Q: 3103] OnExamination 2012 - Respiratory

A 54-year old woman was admitted with acute breathlessness.

On examination she had a temperature of 37°C, a respiratory rate of 32 breaths per minute, a pulse of 120 beats per minute, a blood pressure of 100/60 mmHg, and a peak expiratory flow rate of 250 litres per minute.

Auscultation of the heart and chest was normal.

The chest x ray was normal and blood gases on air showed:

pH 7.35 (7.36-7.44)

paO₂ 6.0 kPa(11.3-12.6)

PaCO₂ 3.9 kPa(4.7-6.0)

Serum bicarbonate 20 mmol/l (20-28)

She was started on high flow oxygen.

What is the most important next treatment?

- 1- Aminophylline intravenously
- 2- Amoxicillin intravenously
- 3- Intravenous fluids
- 4- Low molecular weight heparin (LMWH)
- 5- Nebulised salbutamol

Answer & Comments

Answer: 4- Low molecular weight heparin (LMWH)

This patient has features of a type 1 respiratory failure with mixed acid-base disturbances.

The differential diagnosis here lies between pulmonary embolism (PE) and acute severe asthma.

On the basis of the reasonable peak expiratory flow rate (PEFR) of 250, the tachycardia and hypotension, PE seems the more likely explanation and LMWH would be the treatment of choice.

Intravenous (IV) fluids are potentially harmful since the cause of the shock is an obstructed right ventricle. Fluids may dilate the ventricle further and reduce cardiac output.

There is a role for fluids in those patients with rapidly falling blood pressure but this should preferably be done (if there is time) with central pressure monitoring.



[Q: 3104] OnExamination 2012 - Respiratory

A 16-year-old girl presents with a two day history of deteriorating breathlessness and dyspnoea.

Blood gas analysis on admission shows:

pH 7.257.35-7.45

pCO₂ 7.0kPa4.7-6.0

pO₂ 8.5kPa9.3-13.3

base excess-4 mmol/l 3 to +3

Which of the following interpretations is correct?

- 1- Bicarbonate may be necessary to correct the acidosis.
- 2- Blood gases suggest type 1 respiratory failure.
- 3- Immediate intubation is required.
- 4- Results are consistent with bronchopulmonary dysplasia.
- 5- Results are consistent with late severe asthma.

Answer & Comments

Answer: 5- Results are consistent with late severe asthma.

In interpreting blood gas results, the following sequence may be useful:

Inspect the pH: Is it low, normal or high?

Inspect the CO₂: Is it low, normal or high?

Inspect the PO₂: Is it low, normal or high?

If the pH is low then an acidosis is present, and inspecting the CO₂ will enable you to determine whether this is due to respiratory or metabolic causes.

Inspecting the PO₂ will tell you whether the patient is hypoxic or not.

In this case, the pH is reduced, and the CO₂ is high, with a base deficit of only -4, insufficient to explain the acidosis from metabolic causes.

This is, therefore, a respiratory acidosis, and the PO₂ is also low suggesting type 2 respiratory failure.

Possible causes would include severe pneumonia, end stage asthma or neurogenic causes such as Guillain-Barre.

In asthma, the initial stages show a low CO₂, with this climbing only to accompany failing respiration. The results would therefore be consistent with late severe asthma. There are high risks associated with intubation and ventilation of asthmatics, due to the high pressures required. Intensive therapy (incl. IV aminophylline or salbutamol and Magnesium) would precede this.

In bronchopulmonary dysplasia, there is usually long-term CO₂ retention with compensatory increase in bicarbonate leading to a positive base excess and normal pH.

Bicarbonate is usually only considered if the base deficit exceeds about -8.



[Q: 3105] OnExamination 2012 - Respiratory

A 17-year-old boy with known cystic fibrosis is under regular follow up at his local specialist centre.

Which one the following conditions (associated with cystic fibrosis), is he most likely also to have?

- 1- Biliary cirrhosis
- 2- Delayed puberty
- 3- Gallstones
- 4- Nasal polyps
- 5- Sinusitis

Answer & Comments

Answer: 2- Delayed puberty

Almost 100% of children with cystic fibrosis will have delayed development and puberty.

Dysfunctional gallbladder and gallstones can be seen in 10-30% of cases.

Symptomatic sinusitis is seen in 10% of children and 20% of adult patients.

Nasal polyps are less common with an estimated incidence of 15-20% (most of these occurring in the second decade).

Biliary cirrhosis is far rarer with approximately 5% of adults affected.

Almost all male CF patients will be infertile; there is a 20% incidence amongst female patients.

Pancreatic insufficiency is also common, with 85% of patients affected.

Other associated conditions include vitamin D deficiency resulting in bone demineralisation, hypertrophic osteoarthropathy and rectal prolapse.



[Q: 3106] OnExamination 2012 - Respiratory

A 75-year-old man with squamous cell carcinoma is thought to have resectable disease.

Which of the following would be a contraindication to surgery?

- 1- Clubbing
- 2- Forced expiratory volume (FEV) 1 of 0.75 L
- 3- His age of 75 years
- 4- Pleural effusion
- 5- Syndrome of Inappropriate ADH

Answer & Comments

Answer: 2- Forced expiratory volume (FEV)1 of 0.75 L

Contraindications to surgery are:

Proven metastases

Mediastinal organ involvement

Malignant pleural effusion (that is, straw coloured, reactive effusions are not a contraindication if cytology is negative)

Contralateral mediastinal node involvement

A predicted post-operative FEV₁ <0.8l (often a preoperative FEV₁ of 2l)

Severe cardiac or other significant disease (for example, cerebrovascular, renal, liver, etc).



[Q: 3107] OnExamination 2012 - Respiratory

A 32-year-old woman is admitted from a party complaining of extreme light-headedness and pleuritic chest pain she also says she has pins and needles in both hands.

She has a past history of asthma which is controlled with a beclomethasone inhaler and prn salbutamol.

On examination her BP is 110/72mmHg, her pulse is 95 and regular. There is scattered

wheeze on auscultation of her chest but good air entry bilaterally. Her peak flow is 500, (580 predicted).

Investigations show:

pH 7.52 (7.35-7.45)

pCO₂ 3.5 kPa(4.8-6.1)

pO₂ 12.9 kPa(10-13.3)

Which of the following is the most appropriate therapy with respect to reducing the likelihood of future attendance in the Emergency department?

- 1- Diaphragmatic breathing exercises
- 2- Diazepam
- 3- Fluoxetine
- 4- Montelukast
- 5- Seretide

Answer & Comments

Answer: 1- Diaphragmatic breathing exercises

This patient is hyperventilating as judged by her symptoms, (peripheral numbness, pleuritic chest pain and shortness of breath), and arterial blood gasses. There is only a minor reduction in peak flow.

In this case, teaching diaphragmatic breathing, (as opposed to thoracic breathing which is practised by many asthmatics), may significantly impact on symptoms.

Diazepam is not recommended in this case as it does not address the underlying problem responsible for her presentation, (likely thoracic breathing).

Fluoxetine is effective in treating anxiety but from the presentation described it does not appear that anxiety / depression is a significant driver.

Whilst montelukast and Seretide are appropriate steps up in asthma therapy, there is only a small reduction in peak flow from

that predicted; as such neither is indicated here.



[Q: 3108] OnExamination 2012 - Respiratory

An otherwise healthy 78-year-old female presents complaining of a three day history of tiredness and breathlessness.

Her pulse oximetry shows oxygen saturation of 90%.

Arterial blood gas analysis performed on air shows

pH 7.3(7.36-7.44)

pO₂ 7.8 kPa(11.3-12.6)

pCO₂ 7.5 kPa(4.7-6.0)

Bicarbonate 30 mmol/L(20-28)

What is the most likely cause?

- 1- Bronchial asthma
- 2- Left ventricular failure
- 3- Lobar pneumonia
- 4- Neuromuscular weakness
- 5- Pulmonary embolism

Answer & Comments

Answer: 4- Neuromuscular weakness

This patient has type 2 respiratory failure as evidenced by hypoxia PaO₂ of <8.0kPa and hypercapnia PaCO₂ >6.0kPa.

This occurs when alveolar ventilation is insufficient to excrete the amount of CO₂ produced by metabolism. This is due to

Reduced ventilatory effort

Failure to overcome increased resistance to ventilation

Failure to compensate for an increase in CO₂ production

or a combination of these factors.

The commonest cause is chronic obstructive airway disease, other causes include respiratory muscle weakness, for example, Guillain-Barre syndrome, chest wall deformity, respiratory centre weakness.

The other causes listed here produce type 1 respiratory failure with a mismatch between ventilation and perfusion.



[Q: 3109] OnExamination 2012 - Respiratory

An otherwise healthy 32-year-old man was the driver of a car involved in a high speed RTA three days ago.

He has sustained a closed fracture of his femur which has been treated surgically with an intramedullary nail, as well as fractures of his right clavicle and left radius.

He was managed according to ATLS protocol when he attended the emergency department.

On examination, he is acutely short of breath and has a temperature of 37.5°C. The patient seems confused when you speak to him, and as you examine him, you note petechial haemorrhages.

What do you think is the most likely diagnosis?

- 1- Asthma attack
- 2- Chest infection
- 3- Fat embolism
- 4- Pulmonary embolism
- 5- Tension pneumothorax

Answer & Comments

Answer: 3- Fat embolism

The two diagnoses which should be considered first in this scenario are pulmonary embolism and fat embolism.

Although the patient is at high risk of pulmonary embolism, and appropriate measures should be undertaken to reduce

this, the clinical scenario is more suggestive of fat embolism.

Fat embolism is thought to occur as a result of release of lipid globules from damaged bone marrow fat cells.

Another mechanism that has been suggested is the increased mobilisation of fatty acids peripherally.

The effects that are seen clinically depend on what part of the microvasculature is affected by the lipid globules.

Pulmonary symptoms are caused by ventilation perfusion mismatch.

Confusion (cerebral effects) may be seen, as well as a petechial rash caused by capillary damage in the skin.



[Q: 3110] OnExamination 2012 - Respiratory

A 45-year-old man is seen in the Emergency department complaining of cough and dyspnoea.

On examination he is disorientated and febrile at 38.5°C. He has a pulse of 100/min and his blood pressure is 85/55 mmHg. He has oxygen saturations of 89% on air and has a respiratory rate of 36/min.

Chest x ray shows left basal consolidation.

Results show:

Sodium 140 mmol/l (137-144)

Potassium 4.0 mmol/l (3.5-4.9)

Urea 10.2 mmol/l (2.5-7.5)

Creatinine 96 µmol/l (60-110)

Which of the following is not part of the CURB score?

- 1- Blood urea concentration
- 2- Confusion
- 3- Consolidation on chest x ray
- 4- Hypotension

5- Tachypnoea

Answer & Comments

Answer: 3- Consolidation on chest x ray

The CURB score is calculated by assessment of core adverse prognostic features which are used in assessment of severity of pneumonia.

Two from four features indicate a severe pneumonia and hospital admission is advised.

The CURB score is calculated using:

Confusion abbreviated mental test score <8.

Urea >7 mmol/l.

Respiratory rate >30/min.

Blood pressure: systolic BP <90 mmHg or diastolic BP <60 mmHg.



[Q: 3111] OnExamination 2012 - Respiratory

A 70-year-old man presents with weight loss and dyspnoea and is diagnosed with small cell lung cancer.

Which one of the following is an adverse prognostic feature?

- 1- Cavitation on x ray
- 2- Finger clubbing
- 3- Hypernatraemia
- 4- Hypertrophic pulmonary osteoarthropathy
- 5- Increased alkaline phosphatase

Answer & Comments

Answer: 5- Increased alkaline phosphatase

The following are adverse prognostic factors in small cell lung cancer:

Serum sodium < 132 mmol/l

Weight loss > 10%

WHO performance status > 2

Alkaline phosphatase > 1.5 times upper limit of normal

Lactate dehydrogenase (LDH) > 1.5 times upper limit of normal

Extensive disease (disease occurring outside one hemithorax and ipsilateral supraclavicular fossa nodes).



[Q: 3112] OnExamination 2012 - Respiratory

A 61-year-old heavy smoker with a BMI of 37 presents with impotence, nocturia and depression.

He is hypoxic at rest on air and has ankle oedema.

Which is the most appropriate investigation to determine the aetiology?

- 1- Arterial blood gas
- 2- Chest x ray
- 3- Sleep study
- 4- Thyroid function test
- 5- Ventilation-perfusion scan

Answer & Comments

Answer: 3- Sleep study

The combination of obesity and hypoxia in this scenario should lead you to consider obstructive sleep apnoea (OSA) as a diagnosis.

Sleep apnoea is defined as repeated episodes of obstructive apnoea and hypopnoea during sleep, together with daytime sleepiness or altered cardiopulmonary function. It affects 2-4% of middle aged adults, although it is important to note that a significant proportion of cases probably go undiagnosed.

Obstructive sleep apnoea has been increasingly implicated in the initiation and progression of cardiovascular diseases. The repeated nocturnal hypoxaemia is associated with activation of a number of neural, humoral, thrombotic, metabolic and

inflammatory mechanisms. Patients have an increased risk of diurnal hypertension, nocturnal dysrhythmias, pulmonary hypertension, right and left ventricular failure, myocardial infarction and stroke.

The hypoxaemia, catecholamine surges and increased blood pressure during sleep, together with daytime hypertension may predispose to hypertensive heart disease, which can manifest as either systolic or diastolic dysfunction. Systolic dysfunction can also be induced by inflammatory cytokines, and increases in afterload and myocardial wall stress caused by negative intrathoracic pressure during episodes of obstruction.

Fatigue, irritability and personality change have also been attributed to nocturnal desaturation and chronic sleep deprivation. Nocturia and erectile dysfunction are also symptoms of OSA.

A sleep-study is used to confirm the presence of upper airway closure during sleep, and lab-based polysomnography is the gold standard for diagnosis. Increasingly, home monitoring systems may be used.

Arterial blood gases vary depending on the time taken, and whether cor pulmonale has developed. The findings are not specific.

Whilst a chest x ray is important when presented with a patient with hypoxia, it will not help with the diagnosis of OSA.

Hypothyroidism could account for this gentleman's depression and erectile dysfunction, but OSA is a much more likely diagnosis.

Ventilation-perfusion scans are used in the diagnosis of pulmonary emboli, although are being increasingly replaced by CTPAs. Whilst recurrent pulmonary thromboembolism can lead to cor pulmonale this does not fit the clinical scenario presented here.

Therapeutic strategies for OSA are behavioural (avoid alcohol and strategies, weight loss etc.),

medical (positive airway pressure, oral appliances) and surgical (tracheostomy, palatal and maxillofacial procedures). Treatment decisions are based on daytime symptoms and cardiopulmonary function. The goals are to establish normal nocturnal oxygenation and ventilation, abolish snoring and eliminate disruption of sleep.



[Q: 3113] OnExamination 2012 - Respiratory

A 40-year-old male, with disseminated malignancy and unknown primary, presents with oedema of the arms and face, with dilated neck veins.

You suspect superior vena cava obstruction (SVCO).

Which of the following statements is correct?

- 1- IV dexamethasone is of no benefit
- 2- Loss of pulsation in the venous system of the neck is of no clinical use in the diagnosis of SVCO
- 3- Mediastinal radiotherapy relieves symptoms in 90% of patients
- 4- Palliative treatment alone is indicated
- 5- Small cell lung cancer is unlikely to be the cause

Answer & Comments

Answer: 3- Mediastinal radiotherapy relieves symptoms in 90% of patients

This is an oncological emergency.

Mediastinal radiotherapy leads to symptomatic relief in 90% of patients within two weeks.

If possible, an attempt should be made to obtain a tissue diagnosis, as some tumours respond to radiotherapy whereas others are more sensitive to chemotherapy.

Therefore the active pursuit of a diagnosis with active treatment of the SVCO is indicated and not merely palliative measures.

Non-small cell cancer (SCC) and small cell malignancy may both cause SVCO.

Intravenous dexamethasone at high dose is of benefit in severe cases of SVCO.



[Q: 3114] OnExamination 2012 - Respiratory

A 28-year-old man who had had tuberculosis of the mediastinal lymph nodes diagnosed two weeks previously and who had been started on chemotherapy with rifampicin, isoniazid and pyrazinamide was admitted because of the increasing dyspnoea and stridor.

Chest x ray showed compression of both main bronchi by carinal lymph node enlargement.

What is the next step in management?

- 1- Mediastinoscopy and biopsy
- 2- Refer for tracheal stent insertion/tracheostomy
- 3- Refer for urgent CT scan of the mediastinum
- 4- Start corticosteroids
- 5- The addition of ethambutol

Answer & Comments

Answer: 4- Start corticosteroids

The treatment of TB mediastinal lymphadenitis is the same as pulmonary TB.

The phenomenon of a 'paradoxical reaction' during treatment for TB has been recognised for many years. This can result in new lesions, or worsening of existing lesions. It is unpredictable in its timing, and can occur anything from a few days to many months after the start of treatment. Duration and severity is highly variable, and it can be difficult to differentiate from treatment

failure, drug resistance or a superadded infection. Most cases are recognised in the setting of lymph node or cerebral disease. Enlargement is seen in 30% of cases. Occurrences are usually self-limiting.

Corticosteroids are effective in reducing lymph node enlargement and inflammation, and hence will help the stridor and breathlessness.

As the compression is at the carina, tracheal stent or tracheostomy will not relieve the obstruction.

The diagnosis is already known, therefore mediastinoscopy and biopsy will not give any extra information. The same applies to a CT.

Whilst standard TB treatment is usually with ethambutol, rifampicin, isoniazid and pyrazinamide initially for two months, when the organism is known to be fully sensitive ethambutol need not necessarily be used. It is unlikely the omission of this drug has caused treatment failure, and therefore adding it at this time is unlikely to relieve the symptoms.



[Q: 3115] OnExamination 2012 - Respiratory

Which of the following statements regarding prognosis in lung cancer is true?

- 1- Combined modality therapy (chemotherapy, radiation therapy and surgery) has improved overall lung cancer survival to 40% at five years.
- 2- Overall lung cancer survival is less than 15% at five years.
- 3- Patients undergoing radiation therapy have a five year survival of 40%.
- 4- Patients who qualify for surgery have a 50% five year survival.
- 5- With chemotherapy, overall survival in small cell (oat cell) carcinomas has risen to 60% at five years.

Answer & Comments

Answer: 2- Overall lung cancer survival is less than 15% at five years.

Prognosis is related to staging and tumour type.

It is obviously higher with a lesion that is confined and resectable (no LAP with no distant metastases) and is not of the small cell/oat cell type.

However, overall five year survival for patients is still of the order of 14%. (American Cancer Society 1998). This contrasts with approximately 50% for cancer of the breast and around 70% for cancer of the cervix.

Overall, only about 20% of cases of non-small cell lung cancer (NSCLC) are regarded as suitable candidates for resection at presentation. Prognosis after surgery however is about 50-67% at five years with stage 1 disease.

Prognosis for small cell cancer despite chemotherapy is grim - 10% at five years.



[Q: 3116] OnExamination 2012 - Respiratory

A 65-year-old female presents with a three week history of malaise and blood in her sputum.

Bronchoscopy reveals a mass in the right main bronchus, and histology demonstrates it to be a small cell carcinoma. Further investigation fails to show any metastases.

What is the most appropriate step in management?

- 1- Chemotherapy
- 2- Endobronchial laser therapy
- 3- Palliative therapy
- 4- Radiotherapy
- 5- Surgery

Answer & Comments

Answer: 1- Chemotherapy

In patients with limited-stage small cell lung cancer, as this patient appears to present with, combination chemotherapy produces results that are clearly superior to single-agent treatment, and moderately intensive doses of drugs are superior to doses that produce only minimal or mild haematologic toxic effects.

Current programmes yield overall objective response rates of 65% to 90% and complete response rates of 45% to 75%.

Because of the frequent presence of occult metastatic disease, chemotherapy is the cornerstone of treatment for patients with limited-stage small cell lung cancer.

Radiotherapy may be considered during the first or second course of chemotherapy.

There is no current clinical trial evidence that adjuvant surgical therapy improves prognosis in these patients, although if a tumour is deemed amenable to surgical resection then it may be offered to the patient.

Source: National Cancer Institute (USA)



[Q: 3117] OnExamination 2012 - Respiratory

Which of the following is not a recognised feature of Pancoast's tumour?

- 1- Erosion of the first rib
- 2- Ipsilateral Horner's syndrome
- 3- Pain in the arm radiating to the fourth and fifth fingers
- 4- Wasting of the dorsal interossei
- 5- Weakness of abduction at the shoulder

Answer & Comments

Answer: 5- Weakness of abduction at the shoulder

The tumour causes pain in the C8 and T1 distribution and Horner's syndrome.

It may cause small muscle wasting of the hands and erosion of the first rib.

The nerve root for abduction of shoulder is C5.



[Q: 3118] OnExamination 2012 - Respiratory

A 23-year-old man presents to the Emergency department with sudden onset left sided pleuritic chest pain. He has had a chronic cough over the past few days and says the pain came on after a coughing fit.

On examination his BP is 148/82 mmHg, pulse is 82 and regular, his saturations are 95% on air. Chest sounds appear normal.

Investigations show:

pH 7.42(7.35-7.45)

pCO₂ 4.8 kPa(4.8-6.1)

pO₂ 10.2 kPa(10-13.3)

CXR Small left sided pneumothorax (<5%)

Which of the following is the most appropriate way to manage him?

- 1- Admit for overnight oxygen therapy
- 2- Chest drain
- 3- Discharge and review in 24 hours
- 4- Discharge and review in the clinic in two to three weeks
- 5- Pleural aspiration

Answer & Comments

Answer: 4- Discharge and review in the clinic in two to three weeks

A more significant pneumothorax could be managed with needle aspiration in the first instance, with formal chest drain the next step if re-inflation does not occur.

Simple aspiration with a venflon needle is only considered for very large pneumothoraces which require immediate intervention.



[Q: 3119] OnExamination 2012 - Respiratory

Based on the current British Thoracic Society (BTS) guidelines, which is the first line empiric antibiotic therapy regime for patients with severe community acquired pneumonia (CAP) based on a CURB-65 score of 4?

- 1- Amoxicillin 500 mg TDS
- 2- Amoxicillin 1 g TDS and clarithromycin 500 mg BD
- 3- Benzylpenicillin 1.2 g QDS and levofloxacin 500 mg BD
- 4- Co-amoxiclav 1.2 g TDS and clarithromycin 500 mg BD
- 5- Doxycycline 200 mg loading dose and then 100 mg OD

Answer & Comments

Answer: 4- Co-amoxiclav 1.2 g TDS and clarithromycin 500 mg BD

BTS has issued clear guidelines on the most appropriate antibiotic regime to treat community-acquired pneumonia, according to the severity, which is often based on the CURB-65 score.

BTS guidelines recommend the use of amoxicillin and clarithromycin as the first line antibiotic regime in the treatment of moderate severity CAP. If the oral route is not possible, benzylpenicillin and clarithromycin should be used.

Amoxicillin alone is recommended for low severity CAP (CURB-65 <2) whether treated at home or in hospital.

Doxycycline may be used as an alternative antibiotic regime, but is not the preferred treatment according to these guidelines.

Co-amoxiclav and clarithromycin use should be reserved for severe community acquired pneumonia (CURB-65 3-5).

BTS guidelines



[Q: 3120] OnExamination 2012 - Respiratory

A 17-year-old girl with known cystic fibrosis presents with a chest infection.

What antibiotic would be most suitable for her?

- 1- Amoxicillin
- 2- Augmentin
- 3- Cefotaxime
- 4- Ceftazidime
- 5- Gentamicin

Answer & Comments

Answer: 4- Ceftazidime

In cystic fibrosis the airways become obstructed by thick mucus due to defective chloride secretion and increased sodium resorption. This leads to bacterial colonisation early in life.

The bacteria present depend on the age of the patient: infants and young children become colonised by *Staphylococcus aureus* and then *Haemophilus influenzae*. In teenagers, *Pseudomonas aeruginosa* colonisation occurs.

Other organisms which can cause infection include *Streptococcus pneumoniae*, *Burkholderia cepacia* (which confers a worse prognosis), *Mycobacterium tuberculosis*, other mycobacteria, *Aspergillus fumigatus* and viruses.

In the UK, antibiotics are usually given when the sputum becomes purulent, pulmonary function deteriorates, or the patient is unwell (e.g. weight loss). In this age groups, Pseudomonal cover is needed and a combination of intravenous antibiotics is used

to reduce the risk of resistance developing. The usual combination is ceftazidime and tobramycin, for a period of two weeks.

Cefotaxime, augmentin and amoxicillin do not have pseudomonal cover. Gentamicin can be used in place of tobramycin, but has poorer pseudomonal cover and is associated with significant side effects (nephrotoxicity and ototoxicity).

Sputum samples should be obtained, and organism identification and sensitivities can be used to guide treatment of future exacerbations.



[Q: 3121] OnExamination 2012 - Respiratory

A 38-year-old man presents with episodic wheeze and non-productive cough which occurs particularly at night. He has been employed in the plastics industry.

Which of the following suggests a diagnosis of occupational lung disease?

- 1- Absent family history of asthma
- 2- Commencement of symptoms on his first day in this employment
- 3- Elevated serum IgE concentration
- 4- Improved symptomatology when on holiday
- 5- Increased bronchial reactivity

Answer & Comments

Answer: 4- Improved symptomatology when on holiday

Episodic cough and wheeze with nocturnal symptoms are classical of asthma.

Occupational asthma is the commonest industrial lung disease with over 400 causes and accounts for up to 10% of adult onset asthma. The commonest occupations affected are spray painters, bakers, chemical

processors, plastics workers and welders and soldering.

Patients are characteristically better when on holiday.

The diagnosis is confirmed by serial peak expiratory flow (PEF) measurements at home and at work. Recordings should be performed two hourly for four weeks or if this is not possible metacholine/histamine challenges can be undertaken after days at work and away from work.

Following objective confirmation of the diagnosis the underlying cause should be identified.



[Q: 3122] OnExamination 2012 - Respiratory

A 40-year-old man presents with a long history of productive cough and breathlessness. He had complained of halitosis and exacerbations of productive sputum, chest pain and haemoptysis.

Examination revealed bilateral inspiratory crackles.

Which of the following treatments is likely to decrease the frequency of his exacerbations?

- 1- Cyclical antibiotic therapy
- 2- Inhaled corticosteroids
- 3- Nebulised bronchodilators
- 4- Postural drainage
- 5- Surgical resection

Answer & Comments

Answer: 4- Postural drainage

This man has bronchiectasis as evidenced by his regular production of sputum associated with breathlessness, his repeated lung infections and the signs of bilateral inspiratory crackles.

Retained mucus is the most important reason why bronchiectatic patients become infected.

Postural drainage is therefore the cornerstone to treating bronchiectasis and should be undertaken at least once per day and more frequently during exacerbations.

There have been trials looking at regular antibiotic therapy versus symptomatic treatment in patients with cystic fibrosis colonised with *Pseudomonas* (for example, Elborn JS et al. Thorax 2000;55: 355-358) but there is currently no evidence that this approach is of benefit in bronchiectasis.

Similarly inhaled corticosteroids should not be used routinely in bronchiectasis until further evidence of their effect on lung function and exacerbation frequency is available.

Surgical resection as a curative procedure can be performed for localised disease when underlying causes such as primary ciliary dyskinesia have been excluded.

In this patient the bilateral crackles suggests widespread disease.



[Q: 3123] OnExamination 2012 - Respiratory

A 48-year-old man with a known history of chronic alcohol abuse presented with a three day history of fevers, night sweats and a cough productive of purulent sputum.

There was no past history of respiratory disease.

On examination he was febrile (39.1°C). Percussion note was dull over the right apex and there was bronchial breathing in this area on auscultation.

The chest x ray showed right upper lobar consolidation.

Other investigations revealed:

WBC $23 \times 10^9/L$ ($4-11 \times 10^9$)

Neutrophils $18.3 \times 10^9/L$ ($1.5-7 \times 10^9$)

What is the most likely diagnosis?

- 1- Aspiration pneumonia

- 2- Klebsiella pneumonia
- 3- Legionella pneumonia
- 4- Mycoplasma pneumonia
- 5- Primary tuberculosis

Answer & Comments

Answer: 2- Klebsiella pneumonia

Community-acquired Klebsiella pneumonia is a disease of debilitated middle-aged and older men with alcoholism. Mortality rates are as high as 50% regardless of treatment.

Klebsiella pneumonia characteristically affects one of the upper lobes of the lung, although infection of the lower lobes is not uncommon. There is an increased tendency toward abscess formation.

Aspiration pneumonia typically affects in right lower lobe in persons with impaired swallowing.

Legionnaires' disease is associated with contaminated air conditioning and water delivery systems.

Mycoplasma pneumoniae infections have an insidious onset with malaise, myalgia, sore throat and headache. Cough is characteristically dry.

Chest x ray (CXR) changes are usually patchy and involve the lower or middle lobes.



[Q: 3124] OnExamination 2012 - Respiratory

A 63-year-old woman with diabetes presents with a pyrexia, productive cough and shortness of breath for five days.

She has RLL consolidation and a small unilateral pleural effusion on CXR.

Which is a marker of poor prognosis?

- 1- Her age
- 2- Her CXR signs
- 3- Her diabetes

- 4- Temp >38°C
- 5- WCC > 15

Answer & Comments

Answer: 3- Her diabetes

Indicators of poor prognosis in pneumonia include

Age more than 65

Co-existing morbidity including diabetes mellitus

Chronic renal failure

Stroke

Coronary artery disease

Respiratory rate more than 30 and

Mental impairment.

Biochemical/haematological markers include

White count less than 4 or more than 30

Hypoxia needing CPAP or FiO₂ greater than 60%

Positive blood culture and

Blood urea more than 7.



[Q: 3125] OnExamination 2012 - Respiratory

A 65-year-old woman presented with increasing fatigue, dyspnoea and a dry cough.

Her chest x ray shows an area of dense pneumonia-like consolidation in the right lower lobe.

A course of antibiotics did not improve her symptoms or chest x ray. Bronchioalveolar lavage (BAL) retrieved 'atypical' cells.

What is the most likely diagnosis?

- 1- Bronchioloalveolar cell carcinoma
- 2- Mycoplasma pneumonia
- 3- Pulmonary alveolar proteinosis

- 4- Pulmonary embolism with infarction
5- Sarcoidosis

Answer & Comments

Answer: 1- Bronchioloalveolar cell carcinoma

"Bronchoalveolar carcinoma accounts for between 1-20% of pulmonary neoplasms. The population most affected is middle-aged, with no predilection for either sex. Interestingly, there is an increased incidence in patients with scleroderma or other diseases causing localized parenchymal scarring or diffuse interstitial fibrosis. Diffuse bilateral involvement in bronchoalveolar cell carcinoma occurs late in the disease and is usually spread by the bronchial tree. Manifestations include both local and diffuse forms. The local form may grow very slowly changing little for several years. The diffuse form simulates an airspace filling disease with air bronchograms and air broncholograms. A pleural effusion develops in 8-10% of cases." More ...



[Q: 3126] OnExamination 2012 - Respiratory

In which of the following have randomised controlled trials shown that long term oxygen therapy (LTOT) reduces mortality?

- 1- Asthma
2- Cor pulmonale due to chronic airflow obstruction
3- Cryptogenic fibrosing alveolitis
4- Cystic fibrosis
5- Pulmonary sarcoidosis

Answer & Comments

Answer: 2- Cor pulmonale due to chronic airflow obstruction

Adequate data for LTOT prolonging survival exists only for chronic obstructive pulmonary disease (COPD) although in practice it is

assumed to apply in other chronic hypoxaemic lung conditions.



[Q: 3127] OnExamination 2012 - Respiratory

Which one of the following cells in the lung parenchyma produces surfactant?

- 1- Alveolar macrophage
2- Endothelial cell
3- Goblet cell
4- Type I pneumocyte
5- Type II pneumocyte

Answer & Comments

Answer: 5- Type II pneumocyte

Surfactant is produced by type 2 pneumocytes and is responsible for the ability of the air-filled alveoli to expand without collapse.



[Q: 3128] OnExamination 2012 - Respiratory

A 43-year-old man with asthma develops worsening breathlessness and his full blood count has revealed an eosinophilia. A diagnosis of allergic bronchopulmonary aspergillosis (ABPA) is suspected.

Which of the following statements is true with regard to this diagnosis?

- 1- Circulating IgG precipitins to *Aspergillus fumigatus* are positive
2- Pleural effusion is a complication
3- Recurrent haemoptysis is a characteristic feature
4- The CO transfer factor is unaffected
5- The immediate skin test to an extract of *Aspergillus fumigatus* is negative

Answer & Comments

Answer: 1- Circulating IgG precipitins to *Aspergillus fumigatus* are positive

Immediate (type I) reactions occur in virtually all patients with ABPA following intradermal injections of *A. fumigatus* extracts, with only 16% developing delayed (type IV) reactions.

Precipitating IgG antibodies are present in 70% of patients.

Transfer factor may be affected in the later fibrotic stage of the disease.

Haemoptysis is symptom of aspergilloma and bronchiectasis, but is not characteristic of ABPA.



[Q: 3129] OnExamination 2012 - Respiratory

A 28-year-old woman comes to see you with her partner. She has a brother who has been diagnosed with cystic fibrosis and her partner has tested positive as a carrier for the disease.

They want to know about what the future holds if one of their children is born with cystic fibrosis.

Which of the following is true?

- 1- Constipation is common in patients with CF
- 2- Diabetes only occurs in those patients who are overweight
- 3- Females with the disease are infertile
- 4- Median survival is expected to be around 27 years
- 5- Pancreatic enzyme supplements are only required if patients cannot maintain their weight

Answer & Comments

Answer: 1- Constipation is common in patients with CF

Constipation even after the initial few days of life during which meconium ileus occurs is common in patients with cystic fibrosis. It usually responds to an increase in fluids coupled with adequate soluble fibre in the diet and pancreatic enzyme supplementation.

Pancreatic endocrine, as well as exocrine, failure occurs in patients with cystic fibrosis.

Diabetes mellitus occurs in >65% of patients by age 25 and this is independent of weight gain.

Females with CF have a relatively minor reduction in their fertility, and many have now gone on to have successful pregnancies.

Median survival has increased significantly over the past 10 years, and is now around 37 years.

Pancreatic enzyme supplements are required to help patients maintain weight.



[Q: 3130] OnExamination 2012 - Respiratory

A 64-year-old patient is discussed at the lung cancer MDT following a recent diagnosis of non-small cell lung cancer (squamous sub-type).

He is a current smoker, and is known to have COPD for which he takes inhalers.

The lesion appears confined to the right middle lobe, but surgical resection would require a pneumonectomy.

Which of the following is a contraindication to his having radical surgery?

- 1- Clubbing
- 2- FEV₁ 1.8L
- 3- Hypertrophic pulmonary osteo-arthritis (HPOA)
- 4- Hyponatraemia
- 5- Mediastinal lymph node measuring 0.9 cm on staging CT

Answer & Comments

Answer: 2- FEV₁ 1.8L

For an intervention to be considered curative there should be no evidence of metastatic spread, and practical considerations such as a

patient's respiratory function reserve need to be considered prior to any operation.

The BTS recommends that pre-operatively a patient's FEV₁ should be greater than 1.5L for a lobectomy and greater than 2L for a pneumonectomy. This ensures that the risk of difficulty in ventilation weaning is reduced, and that post-operatively the patient's respiratory function is not severely compromised.

By CT criteria, lymph nodes greater than 1 cm are deemed to be malignant unless proven otherwise.

Paraneoplastic phenomena including clubbing, HPOA and electrolyte disturbances are not contraindications.



[Q: 3131] OnExamination 2012 - Respiratory

Which of the following is classified as a minor risk factor in the development of venous thromboembolism (relative risk 2-4)?

- 1- Caesarean section
- 2- Fracture
- 3- Institutional care
- 4- Oral contraceptive pill
- 5- Varicose veins

Answer & Comments

Answer: 4- Oral contraceptive pill

All patients presenting with possible pulmonary embolism (PE) or venous thromboembolism (VTE) should have the clinical probability assessed. Therefore it is important to note the major and minor risk factors.

Accordingly to the latest British Thoracic Society (BTS) guidelines for pulmonary embolism, use of the oral contraceptive pill is classed as a minor risk factor with a relative risk of 2-4.

Other minor risk factors include

Occult malignancy

Long distance travel

Hypertension

Congestive cardiac failure and

Thrombotic disorder.

Lower limb problems including a fracture or varicose veins are classed as a major risk factor (relative risk 5-20) in the development of VTE.

Other major risk factors include

Post-operative intensive care

Hospitalisation

Abdominal/pelvic or advanced malignancy

Previous VTE and

Pregnancy.

www.brit-thoracic.org.uk/Portals/0/Clinical%20Information/Pulmonary%20Embolism/Guidelines/PulmonaryEmbolismJUN03.pdf



[Q: 3132] OnExamination 2012 - Respiratory

A 31-year-old motorcyclist becomes confused and dyspnoeic on the orthopaedic ward 24 hours after fracturing his right femur in an accident.

Which of the following skin lesions may be found on examination?

- 1- Multiple petechiae in both axilla
- 2- Palpable purpura on buttocks and legs
- 3- Target lesions on his chest
- 4- Tender red nodules on his shins
- 5- Vesicular lesions on his torso

Answer & Comments

Answer: 1- Multiple petechiae in both axilla

The appearance of multiple petechiae in the distribution of the axilla or upper body is characteristic of a fat embolism. Unlike emboli that arise from a thrombus, fat emboli are small and multiple producing widespread effects. They may occur one to three days following a fracture and are more common in closed fractures on the long bones or pelvis.

The clinical features of fat emboli are predominately:

Pulmonary (shortness of breath, hypoxia)

Neurological (confusion and agitation)

Dermatological (petechiae) and

Haematological (thrombocytopenia, anaemia).

The petechial rash is pathognomonic of this syndrome, but only occurs in 30-50% of cases.



[Q: 3133] OnExamination 2012 - Respiratory

Which of the following is classified as a major risk factor in the development of venous thromboembolism (relative risk 5-20)?

- 1- COPD
- 2- Hormone replacement therapy (HRT)
- 3- Obesity
- 4- Oral contraceptive pill
- 5- Varicose veins

Answer & Comments

Answer: 5- Varicose veins

Accordingly to the latest British Thoracic Society (BTS) guidelines for pulmonary embolism, lower limb problems including a fracture or varicose veins are classed as a major risk factor in the development of VTE.

Other major risk factors include

Postoperative intensive care

Hospitalisation

Abdominal/pelvic or advanced malignancy

Previous VTE and

Pregnancy.

The other risk factors listed in the question are classed as minor risk factors with a relative risk of 2-4.

Other minor risk factors include

Occult malignancy

Long distance travel

Hypertension

Congestive cardiac failure and

Thrombotic disorder.

Management of suspected acute pulmonary embolism



[Q: 3134] OnExamination 2012 - Respiratory

A 20-year-old female with cystic fibrosis presents in early pregnancy wanting advice.

Genetic analysis reveals that her partner is a carrier of the cystic fibrosis gene.

Which of the following percentages best represents the chance of her child having cystic fibrosis?

- 1- 10%
- 2- 25%
- 3- 50%
- 4- 75%
- 5- 100%

Answer & Comments

Answer: 3- 50%

The patient is homozygous for CF (CF/CF) and the father is heterozygous for CF (CF/N).

Thus there is a 50% chance that her child will be homozygous for CF and a 50% chance that the child will be a carrier.



[Q: 3135] OnExamination 2012 - Respiratory

A 60-year-old man was admitted with community-acquired pneumonia and deteriorated over the next few hours.

Which one of the following indicates a poor prognosis?

- 1- A total white cell count of $17 \times 10^9/L$ (4-11)
- 2- Blood pressure of 110/70 mm Hg
- 3- Respiratory rate of 35 breaths/min
- 4- Rigors
- 5- Temperature of $39^\circ C$

Answer & Comments

Answer: 3- Respiratory rate of 35 breaths/min

The presence of:

Raised urea ($>7\text{mM}$)

Hypotension (diastolic BP equal or $<60\text{ mmHg}$) and

Respiratory rate equal or $>30/\text{min}$

is associated with significantly increased risk of death.

Other less important features of severe pneumonia include:

Older age (>60)

Comorbidity

Confusion

Cyanosis

White blood cells <4000 or >30000

Hypoxia and

Chest x ray with multilobe involvement.



[Q: 3136] OnExamination 2012 - Respiratory

Which of the following would be the least likely finding in a patient with sarcoidosis?

- 1- Hepatic granulomas
- 2- Restrictive pulmonary function tests
- 3- Skin lesions
- 4- Uveitis
- 5- X bodies on bronchoalveolar lavage (BAL) fluid

Answer & Comments

Answer: 5- X bodies on bronchoalveolar lavage (BAL) fluid

Sarcoidosis is associated with:

Uveitis

Arthritis

Pulmonary fibrosis

Lymphadenopathy and

Skin changes - lupus pernio/erythema nodosum.

It is characterised histologically by the presence of non-caseating granulomas which may occur anywhere. These granulomas have the capacity to produce 1,25 vitamin D explaining the associated hypercalcaemia.

Pentalaminar X bodies (Birbeck granules) found on BAL are considered diagnostic of pulmonary histiocytosis X and so would not be expected with sarcoidosis.



[Q: 3137] OnExamination 2012 - Respiratory

Which one of the following is correct regarding severe bullous emphysema?

- 1- Helium dilution is more accurate than body plethysmography in measuring residual volume.

- 2- Hypoxaemia at rest will improve with exercise.
- 3- Pulmonary compliance is reduced.
- 4- Reduced elastic recoil opposes airway collapse in expiration.
- 5- The carbon monoxide transfer factor is reduced.

Answer & Comments

Answer: 5- The carbon monoxide transfer factor is reduced.

Whole body plethysmography also measures trapped gas, that is, intrathoracic gas (including within bullae and other poorly ventilated areas) which barely communicates with the airway. Standard gas dilution measures gas that communicates with the airway. Mixing in helium dilution is more difficult in airways obstruction requiring multibreath methods lasting five minutes rather than single breath test.

Exertion will exacerbate breathlessness and hypoxia.

The characteristic changes of severe emphysema are increase in static compliance and reduction in lung recoil pressure.

Loss of lung recoil causes a reduction of alveolar pressure (elastic recoil pressure of lung + pleural pressure) leading to collapse of peripheral airways on expiration. Emphysematous patients purse their lips in expiration to increase airway pressure to prevent this collapse.

CO transfer factor is reduced.



[Q: 3138] OnExamination 2012 - Respiratory

A 55-year-old female is admitted with a chest infection.

Investigations reveal consolidation in the right base on the chest x ray and urinary legionella antigen is found to be positive.

Which one of the following is the most appropriate treatment for this woman?

- 1- Cefotaxime
- 2- Clarithromycin
- 3- Co-amoxiclav
- 4- Minocycline
- 5- Vancomycin

Answer & Comments

Answer: 2- Clarithromycin

The most appropriate treatment for legionellosis is clarithromycin.

Ciprofloxacin is also a useful drug in combination with clarithromycin for severe infections or alone in those intolerant of macrolides.



[Q: 3139] OnExamination 2012 - Respiratory

A 51-year-old businessman complains of dyspnoea on exertion. He recently returned from a business trip to the USA.

He has distant heart sounds on auscultation of the chest. A chest radiograph reveals that there is a thin rim of calcification surrounding the cardiac outline.

Which of the following conditions is most likely responsible for these findings?

- 1- Group B coxsackie virus
- 2- Metastatic carcinoma
- 3- Sarcoidosis
- 4- Tuberculosis
- 5- Uraemia

Answer & Comments

Answer: 4- Tuberculosis

The most likely diagnosis is a constrictive pericarditis.

The most probable cause for this is prior tuberculous (TB) infection which may have occurred many years previously. Acute TB would usually cause a constrictive pericarditis secondary to a pericardial effusion, but is not normally associated with calcification.

Uraemia can cause a constrictive pericarditis, as can a pericardial malignancy and coxsackie virus (secondary to a pericarditis), but calcification would be unusual.

Sarcoid can cause both pericardial as well as restrictive cardiomyopathy but calcification would be unusual.



[Q: 3140] OnExamination 2012 - Respiratory

A 22-year-old student who is known to have severe asthma is brought to the Emergency department by his flatmates. He has been suffering from influenza over the past few days, and been getting progressively increasing cough, wheeze and shortness of breath.

He takes regular high dose Seretide and montelukast. His usual peak flow is 460 (predicted 590).

On examination his BP is 123/80 mmHg, his pulse is 105 and regular, respiratory rate is 35. There is marked wheeze on auscultation of his chest.

Investigations show:

pH 7.43(7.35-7.45)

pCO₂ 6.4 kPa(4.8-6.1)

pO₂ 10.3 kPa(10-13.3)

Which of the features is consistent with near fatal asthma according to BTS guidelines?

- 1- Pulse 100
- 2- Peak flow 280
- 3- pO₂ 10.3
- 4- pCO₂ 6.4
- 5- Respiratory rate 35

Answer & Comments

Answer: 4- pCO₂ 6.4

Raised CO₂ or the need for mechanical ventilation with raised pressures is indicative of near fatal asthma.

Indications of life threatening asthma are also defined in the guidelines, these are:

PEF <33% best or predicted

SpO₂ <92%

PaO₂ <8 kPa

Normal PaCO₂ (4.6-6.0 kPa)

Silent chest

Cyanosis

Poor respiratory effort

Arrhythmia

Exhaustion, altered conscious level.

Therefore, D is the only possible correct answer.



[Q: 3141] OnExamination 2012 - Respiratory

A 19-year-old smoker presents to the Emergency department with right sided pleuritic chest pain and dyspnoea. He has no previous medical history.

His BP is 120/75 mmHg. A CXR is done and confirms a right sided pneumothorax with a rim of 2.5 cm.

What is the pathogenesis of pneumothorax?

- 1- Leak from pulmonary alveoli
- 2- Oesophageal rupture
- 3- Ruptured apical bullae on lung surface
- 4- Underlying asthma
- 5- Underlying emphysema

Answer & Comments

Answer: 3- Ruptured apical bullae on lung surface

Spontaneous rupture of bullae or after minimal trauma causes primary pneumothorax in the young.

Smoking cessation should be advised.



[Q: 3142] OnExamination 2012 - Respiratory

A 75-year-old woman with a productive cough was admitted by her GP.

She has a temperature of 38.2°C. She is not oriented to time or place. On examination she right basal crackles. Her BP is 110/60 mmHg and respiratory rate is 34/min. Pulse is 105 and regular. O₂ saturation is 92%. Chest x ray shows right basal consolidation.

The patient was given IV antibiotics for the first three days, improved and she was switched to oral antibiotics.

Investigations show:

White cell count $15 \times 10^9/L$ ($4 - 11 \times 10^9/L$)

CRP 75 mg/L (<10 mg/L)

Na 140 mmol/L (137 - 144 mmol/L)

K 3.8 mmol/L (3.5 - 4.9 mmol/L)

Urea 9.4 mmol/L (2.5 - 7.5 mmol/L)

Serum Creatinine 100 $\mu\text{mol/L}$ (60 - 110 $\mu\text{mol/L}$)

The patient is now ready for discharge.

What is the best plan of action?

- 1- Check full blood count , U/E and CRP in four weeks
- 2- Chest x ray in six weeks
- 3- CT chest
- 4- Discharge with a prescription of oral antibiotics for five to seven days
- 5- Refer to a respiratory physician

Answer & Comments

Answer: 2- Chest x ray in six weeks

It is important for patients who had pneumonia and had a consolidation on chest x ray to have a follow up chest x ray to ensure complete resolution. This is to exclude any underlying cause especially malignancy.

Not all patients need referral to a respiratory physician; only those who have persistent shadowing on the lung.



[Q: 3143] OnExamination 2012 - Respiratory

A 67-year-old man with a 35 pack/year history is referred to the rapid access lung cancer clinic by the GP following a suspicious chest x ray.

He undergoes a CT scan of his thorax. The report is as follows:

'There is a 4.5 cm mass in the right upper lobe which is involving the right main bronchus. There are several ipsilateral lymph nodes, the largest measuring 2.3 cm. There is no evidence of distant metastases. The overall appearance is in keeping with a lung carcinoma, most likely non-small cell'.

Based on the TNM (tumour, nodes, and metastases) classification, what is the radiological staging of this patient's lung cancer?

- 1- T2N1M0
- 2- T2N2M0
- 3- T2N3M0
- 4- T3N1M0
- 5- T3N2M0

Answer & Comments

Answer: 1- T2N1M0

This patient has a T2N1M0 lung cancer. TMN staging is used by the multidisciplinary team to aid the choice of treatment.

T2 = Tumour with any of the following features of size or extent:

Greater than 3 cm in greatest dimension

Involves main bronchus

Greater than 2 cm distal to the carina

Invades the visceral pleura.

Associated with atelectasis or obstructive pneumonitis that extends to the hilar region but does not involve the entire lung.

N1 = Metastases to ipsilateral peribronchial and/or ipsilateral hilar lymph nodes and intrapulmonary nodes involved by direct extension of the primary tumour.

M0 = No distant metastases.

As taken from NICE lung cancer guidelines 2005.

Full TMN classification



[Q: 3144] OnExamination 2012 - Respiratory

A 19-year-old man presents with sudden onset left-sided pleuritic chest pain and dyspnoea. He has no past medical history of note and takes no regular medication.

On examination he looks in pain. He has a respiratory rate of 35 and his BP is 110/70 mmHg, with a pulse of 95. His chest sounds appear normal.

Investigations show

Haemoglobin 14.8 g/dl(13.5-18)

White cell count $5.0 \times 10^9/L$ (4-10)

Platelets $201 \times 10^9/L$ (150-400)

Sodium 141 mmol/l (134-143)

Potassium 4.8 mmol/l (3.5-5)

Creatinine 94 $\mu\text{mol/l}$ (60-120)

CXR Small rim of air <2 cm on the left hand side

Which of the following is the most appropriate management?

1- Air aspiration

2- Discharge for review the following day

3- Large bore chest drain

4- Observe and give oxygen

5- Small bore chest drain

Answer & Comments

Answer: 1- Air aspiration

Only primary pneumothoraces (less than 2 cm) which are not associated with dyspnoea should be managed with discharge and instructions to return if they become dyspnoeic.

In this case, aspiration should be considered.

If air aspiration is unsuccessful, then small bore chest drain insertion is the treatment of choice; repeat air aspiration should not be attempted.

It is recommended that if there is a previous history of chest disease, all pneumothoraces are managed with a chest drain, rather than attempting air aspiration.



[Q: 3145] OnExamination 2012 - Respiratory

A 32-year-old female smoker presents with acute severe asthma. The SaO_2 are 80% on 15 L of oxygen and the pO_2 is 8.2kPa (10.5-13).

There is widespread expiratory wheeze throughout the chest. She is given IV hydrocortisone, 100% oxygen and 5 mg of nebulised salbutamol.

What is the next step in your management?

1- IV Augmentin

2- IV magnesium

3- IV potassium

4- IV theophylline

5- Oral prednisolone

Answer & Comments

Answer: 2- IV magnesium

This question focuses on acute treatment of asthma.

Your initial approach should be SOS - salbutamol, oxygen and steroids intravenously (IV).

In the meantime a chest x ray should be organised to rule out pneumothorax.

You should then consider further efforts to treat bronchoconstriction - a silent chest, or a tiring patient should suggest ITU review.

The recommended dose of magnesium is 2 g over 30 minutes. The mechanism by which it has its effect is not fully understood, but it is thought that low magnesium levels in bronchial smooth muscle favour bronchoconstriction.

IV theophylline may be considered, but magnesium would be higher on the list.

IV antibiotic may be indicated, but your initial focus should be promoting bronchodilation.

IV potassium may be required as the beta agonists push down the potassium.

Oral prednisolone can wait, as you have already given IV hydrocortisone as part of your SOS approach.



[Q: 3146] OnExamination 2012 - Respiratory

A 21-year-old gentleman with cystic fibrosis presents with infertility.

What is the most likely cause for this?

- 1- Chronic prostatic insufficiency
- 2- Failure of development of the vas deferens
- 3- Increasing alkalinisation of semen
- 4- Primary failure of testosterone production

5- Production of anti-sperm antibodies

Answer & Comments

Answer: 2- Failure of development of the vas deferens

Infertility occurs in 98% of adult men secondary to maldevelopment of the vas deferens or to other forms of obstructive azoospermia.

In women, fertility is decreased secondary to viscid cervical secretions.



[Q: 3147] OnExamination 2012 - Respiratory

A 28-year-old man had been treated for pulmonary tuberculosis with rifampicin, isoniazid, pyrazinamide and ethambutol for four weeks.

Pre-treatment liver function tests (LFTs) were normal but his most recent investigations revealed:

Serum total bilirubin 98 µmol/l (0-18)

Serum alanine aminotransferase 620 u/l (5-45)

Serum aspartate aminotransferase 450 u/l (5-45)

Serum alkaline phosphatase 720 u/l (40-110)

Which one of the following is the most appropriate next step?

- 1- Stop all treatment
- 2- Stop ethambutol
- 3- Stop isoniazid
- 4- Stop pyrazinamide
- 5- Stop rifampicin

Answer & Comments

Answer: 1- Stop all treatment

All tuberculosis patients should have pre-treatment LFTs, should be supervised by a chest physician and should be informed of possible side-effects of treatment.

If there is no pre-existing liver disease, LFTs are only repeated (and treatment stopped) if fever, malaise, vomiting, jaundice or unexplained deterioration occurs during treatment.

Regular LFTs should be performed in patients with previously known chronic liver disease. If AST/ALT levels rise by five times normal/bilirubin level rises, then rifampicin/isoniazid/pyrazinamide should be stopped.

If the patient is not unwell and/or has non-infectious TB, no treatment until LFT returns to normal.

If clinically unwell or sputum smear is positive within two weeks of starting treatment, consider streptomycin and ethambutol until LFT returns to normal.

Once LFT is back to normal, challenge dosages can be reintroduced sequentially in order of isoniazid, rifampicin and pyrazinamide with daily monitoring of patient's condition and LFT.

If there is a further reaction the offending drug should be excluded and a suitable alternative regimen used.



[Q: 3148] OnExamination 2012 - Respiratory

An 18-year-old boy is suspected of having cystic fibrosis (CF).

Which of the following results would be most suggestive of this condition?

- 1- Abnormalities in lung function tests
- 2- Abnormal pancreatic function tests
- 3- Bronchiectasis on a chest x ray
- 4- Elevated sweat chloride concentration
- 5- Low immunoreactive plasma trypsinogen

Answer & Comments

Answer: 4- Elevated sweat chloride concentration

The sweat test is the most important test for CF.

Up to 99% of children with CF have sweat chloride and sodium levels above 70 and 60 mM respectively. In normal children, sweat sodium is higher than chloride. The reversed ratio is another pointer to CF.

Two sweat tests should be performed spontaneously on both arms with pilocarpine iontophoresis. Older children with CF and pancreatic insufficiency have low immunoreactive trypsin.

This and the other tests mentioned may be suggestive of CF but are not diagnostic.



[Q: 3149] OnExamination 2012 - Respiratory

A 60-year-old female presents with recent onset dyspnoea and noisy breathing.

Her chest x ray showed right deviation of the trachea due to a retrosternal goitre.

Which of the following tests is most useful in the assessment of airflow obstruction due to the goitre?

- 1- Flow volume curve
- 2- Forced expiratory flow volume in one second
- 3- Forced vital capacity
- 4- Peak expiratory flow rate
- 5- Residual volume

Answer & Comments

Answer: 1- Flow volume curve

Inspection of the maximal expiratory and inspiratory flow-volume curve is currently the simplest method to establish the presence of

upper airway obstruction associated with a retrosternal goitre.

This may be present in up to 40% of patients with retrosternal goitre and generally requires at least 50% obstruction of the airway before symptoms arise.



[Q: 3150] OnExamination 2012 - Respiratory

A 60-year old man with a history of non-small cell lung cancer was treated with a right lower lobectomy 12 months ago.

He had an abdominal CT scan one month ago which revealed hepatic mass lesions and hilar lymphadenopathy. He now presents with malaise and fatigue.

His results show:

Urinalysis Protein +++

24 hour urine protein 2.7 g/24hr

Serum Urea 30 mmol/L (2.5-7.5)

Serum creatinine 450 µmol/L (60-110)

A renal biopsy shows focal deposition of IgG and C3 with a granular pattern.

What is the most likely diagnosis?

- 1- Goodpasture's syndrome
- 2- Membranous glomerulonephritis
- 3- Minimal change glomerulonephritis
- 4- Nodular glomerulosclerosis
- 5- Rapidly progressive glomerulonephritis

Answer & Comments

Answer: 2- Membranous glomerulonephritis

Membranous GN is associated with:

Malignancy

Elderly patients, male more than female

Medications: penicillamine, GOLD, captopril, and heavy metals: mercury and cadmium

Basement membrane thickening

Rheumatoid arthritis

Autoimmune disease: systemic lupus erythematosus (SLE), thyroid

Nephrotic syndrome is the main presentation

Hepatitis B

Odd infections - like syphilis, leprosy, HIV, schistosomiasis, malaria

Immune complex deposition with IgG and C3

Sickle cell disease.

Forty per cent remit without treatment, 30% develop endstage renal failure (ESRF).



[Q: 3151] OnExamination 2012 - Respiratory

A 19-year-old woman became breathless while travelling on an aeroplane.

Which one of the following features most strongly supports a diagnosis of acute hyperventilation related to a panic disorder?

- 1- Carpal spasm
- 2- Finger paraesthesia
- 3- Hypotension
- 4- Light-headedness
- 5- Loss of consciousness

Answer & Comments

Answer: 1- Carpal spasm

We need to distinguish between the signs that may be expected in the tachypnoea associated with the hypoxia from a pulmonary embolism (PE) or any other serious respiratory problem and the hyperventilation with increased pO₂ in a panic attack.

A carpal spasm would be most likely to reflect this.

Finger paraesthesia can occur with PE, as can hypotension, light-headedness and loss of consciousness.

Carpal spasm is found in association with hyperventilation due to the respiratory alkalosis which results in a reduction in ionised calcium concentration.



[Q: 3152] OnExamination 2012 - Respiratory

A 60-year-old man with ankylosing spondylitis presents with cough, weight loss and tiredness.

His CXR shows longstanding upper lobe fibrosis.

Three sputum tests stain positive for acid fast bacilli (AFB) but are consistently negative for Mycobacterium tuberculosis on culture.

Which of the following is the most likely cause?

- 1- Allergic bronchopulmonary aspergillosis
- 2- Micropolyspora faeni
- 3- Mycobacterium avium intracellulare complex
- 4- Sarcoidosis
- 5- Tuberculosis

Answer & Comments

Answer: 3- Mycobacterium avium intracellulare complex

The presence of AFB yet absence of TB suggests an atypical AFB such as M. avium.



[Q: 3153] OnExamination 2012 - Respiratory

A 60-year-old man with breathlessness, fever and headache is suspected of having farmer's lung.

A CXR shows diffuse nodular shadowing predominantly in the mid and lower zones.

What would be the most useful diagnostic test?

- 1- Blood culture

- 2- Sputum culture

- 3- Serum precipitating antibodies to Aspergillus clavatus

- 4- Serum precipitating antibodies to Cryptostroma corticale

- 5- Serum precipitating antibodies to Micropolyspora faeni

Answer & Comments

Answer: 5- Serum precipitating antibodies to Micropolyspora faeni

The diagnosis of extrinsic allergic alveolitis is based on characteristic clinical, radiological and functional changes and confirmed by demonstration of precipitating antibodies (precipitins) in the patient's serum to the causal antigen.

In farmer's lung precipitins to M. faeni or Thermoactinomyces vulgaris are found in 75-100% of cases during an acute episode.

A. clavatus is the antigen causing malt worker's lung and C. corticale the antigen causing maple bark stripper's lung.



[Q: 3154] OnExamination 2012 - Respiratory

A 60-year-old man who has known small cell lung cancer presents to the clinic for 12 month review.

He has completed five cycles of initial intensive chemotherapy and radiotherapy. His six month review showed shrinkage of his primary lung tumour. Over the past few weeks however he has felt increasingly short of breath and has suffered three episodes of haemoptysis.

On examination he is afebrile, his BP is 155/90 mmHg, and his pulse is 70 and regular. There are coarse crackles throughout both lung fields consistent with COPD.

Investigations show:

Haemoglobin 11.7 g/dl(13.5-17.7)

White cell count $8.2 \times 10^9/L$ (4-11)

Platelets $183 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 4.4 mmol/l (3.5-5)

Creatinine 131 micromol/l (79-118)

Alanine aminotransferase 280 U/l (5-40)

Alkaline phosphatase 245 U/l (39-117)

CXR - Right sided original tumour appears to have increased in size, bilateral hilar lymphadenopathy, two new left sided lung lesions noted.

He suspected he may have a recurrence and brought with him some information on topotecan, downloaded from the internet.

Which of the following is true about topotecan in his case?

- 1- He is only suitable for oral therapy if the first line regime is not appropriate
- 2- He is only suitable for oral therapy if the first line regime is not appropriate and cyclophosphamide, vincristine and doxorubicin (CAV) is inappropriate
- 3- He is suitable for IV therapy
- 4- Small cell carcinoma makes him ineligible for therapy
- 5- Topotecan is recommended for the treatment of all patients with small cell lung cancer

Answer & Comments

Answer: 2- He is only suitable for oral therapy if the first line regime is not appropriate and cyclophosphamide, vincristine and doxorubicin (CAV) is inappropriate

Topotecan is an inhibitor of topoisomerase-1, an enzyme which is involved in DNA replication.

The major study of topotecan in small cell lung cancer used the oral formulation in patients who had relapsed and for whom re-treatment with IV chemotherapy was not considered

appropriate. For this reason NICE guidance recommends it should only be used in patients who have relapsed and cannot be treated with the CAV regime.

Option A does not conform with the current NICE guidance and is therefore inappropriate.

The majority of the IV studies of topotecan were in cervical cancer, so that whilst the IV formulation is an option in cervical cancer, it is not in small cell lung cancer.

Options D and E are inappropriate as topotecan is recommended for a subset of patients with small cell lung cancer.

<http://www.nice.org.uk/nicemedia/live/12348/46330/46330.pdf>



[Q: 3155] OnExamination 2012 - Respiratory

A 71-year-old man presents to the Emergency department with an influenza-like illness.

He says this has been accompanied by a dry cough and diarrhoea over the past few days, and his wife tells you that he is becoming increasingly drowsy and forgetful. They have returned from a hotel in Spain some two days earlier, where they were staying for the winter.

On examination he is pyrexial 38.2 deg C, pulse is 92 and BP is 100/60 mmHg. There is bilateral wheeze on auscultation of the chest.

Investigations show:

Haemoglobin 13.0 g/dl (13.5-17.7)

White cell count $13.0 \times 10^9/L$ (4-11)

Platelets $222 \times 10^9/L$ (150-400)

Sodium 130 mmol/l (135-146)

Potassium 4.1 mmol/l (3.5-5)

Creatinine 129 $\mu\text{mol/l}$ (79-118)

Alkaline phosphatase 30 U/l (39-117)

CXR Left sided pleural effusion and patchy consolidation

Which of the following is the most likely diagnosis?

- 1- Klebsiella pneumoniae
- 2- Legionella pneumophila
- 3- Mycoplasma pneumoniae
- 4- Staphylococcus aureus
- 5- Streptococcus pneumoniae

Answer & Comments

Answer: 2- Legionella pneumophila

Klebsiella and Staphylococcus tend to be cavitating pneumonias, with Klebsiella being associated with chronic alcoholism, and Staphylococcus with post-influenza pneumonia.

Mycoplasma tends to affect a single lobe, and is associated with haemolytic anaemia.



[Q: 3156] OnExamination 2012 - Respiratory

A 42-year-old farmer is admitted with a severe cough, fevers and shortness of breath. You understand that he has been clearing out a shed over the past few days which were previously used for over-wintering cattle.

On examination he has a temperature of 38.2°C, his BP is 110/70 mmHg and his pulse is 95 and regular. There are widespread coarse crackles on auscultation.

Investigations show:

Haemoglobin 13.9 g/dl (13.5-17.7)

White cell count $12.8 \times 10^9/L$ (4-11)

Platelets $222 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 4.1 mmol/l (3.5-5)

Creatinine 110 micromol/l (79-118)

CXR - diffuse consolidation.

Which of the following is the most appropriate treatment?

- 1- Amphotericin B
- 2- Clarithromycin
- 3- Fluconazole
- 4- Penicillin
- 5- Prednisolone

Answer & Comments

Answer: 5- Prednisolone

This man has acute farmer's lung, as a result of exposure to actinomycetes in mouldy hay. It leads to an acute hypersensitivity pneumonitis, the primary treatment of which is with corticosteroids. He should of course avoid repeated exposure because of the risk of chronic farmer's lung.

Whilst the aetiology is hypersensitivity to fungal spores, it is corticosteroids which are the primary treatment modality. As such both amphotericin B and fluconazole are inappropriate answers.

Clarithromycin and penicillin would be considered treatments for bacterial pneumonia.



[Q: 3157] OnExamination 2012 - Respiratory

Which of the following is a recognised treatment for complications of cystic fibrosis?

- 1- DNase to assist in reinflating collapsed lung segments
- 2- Hypotonic saline drinks for hypernatraemic dehydration
- 3- Nebulised tobramycin for Pseudomonas colonisation of the lower respiratory tract
- 4- Pancreatic transplant for diabetes mellitus
- 5- Rectal pull-through and anastomosis for rectal prolapse

Answer & Comments

Answer: 3- Nebulised tobramycin for Pseudomonas colonisation of the lower respiratory tract

Human recombinant DNase given as a single daily aerosol seems to improve pulmonary function, decrease the frequency of chest exacerbations, and promotes a sense of well-being in patients with mild to moderate disease with purulent secretions.

This may be because, in the inflamed airway, the nuclei from dead cells account for much of the viscosity of secretions.

Rectal prolapse is usually idiopathic, occurring between one and five years.

Intestinal parasites

Malnutrition

Acute diarrhoea

Ulcerative colitis

Pertussis

Ehlers-Danlos syndrome

Meningocele

Cystic fibrosis

Chronic constipation

can also predispose to it.

Following defecation the prolapse usually resolves spontaneously, or through manual reinsertion by the patient or parent.

Nebulised tobramycin or gentamicin may be given when airway pathogens are resistant to oral antibiotics, or where infection is difficult to control at home.

Hypernatraemic dehydration should be treated in the usual way.



[Q: 3158] OnExamination 2012 - Respiratory

A 49-year-old man is diagnosed with small cell lung cancer.

Despite a normal brain MRI he develops progressive truncal ataxia.

Which of the following would be most useful in the diagnosis of his condition?

- 1- Anti-Purkinje cell antibody levels
- 2- Lumbar puncture
- 3- Serum calcium
- 4- Serum sodium
- 5- Visual evoked potentials

Answer & Comments

Answer: 1- Anti-Purkinje cell antibody levels

Paraneoplastic syndromes are a result of antibody generation from or against malignant cells attacking normal tissue.

Examples include antineuronal antibodies (anti-Hu, anti-Yo, anti-Ri) directed against the Purkinje cells of the cerebellum leading to the cerebellar syndrome described above.

The Lambert-Eaton myasthenic syndrome (LEMS) is a pre-synaptic disorder of auto-antibody IgG directed against the pre-synaptic calcium channel leading to impaired acetylcholine release. Clinically, patients present with muscle weakness that improves with exercise.

Symptomatic hyponatraemia due to syndrome of inappropriate antidiuretic hormone secretion (SIADH) is treated with demeclocycline which induces nephrogenic diabetes insipidus leading to excretion of excess water.

Both non-small cell and small cell lung cancers are associated with paraneoplastic syndromes, although they are more common with the latter due to its neuroendocrine cell origin.



[Q: 3159] OnExamination 2012 - Respiratory

A 24-year-old man presents to the Emergency department and complains of shortness of breath.

Before his chest x ray is taken he tells the casualty officer that he is known to have an 'azygous lobe'.

In what region of the chest x ray would you expect to see an 'azygous lobe'?

- 1- Left lower zone
- 2- Left mid zone
- 3- Left upper zone
- 4- Right lower zone
- 5- Right upper zone

Answer & Comments

Answer: 5- Right upper zone

An azygous lobe is seen in about 0.5% of routine chest x rays and is a normal variant.

It is seen as a 'reverse comma sign' behind the medial end of the right clavicle.



[Q: 3160] OnExamination 2012 - Respiratory

A 73-year-old male smoker presents with haemoptysis of three weeks duration.

Examination reveals left supraclavicular lymphadenopathy. A chest radiograph reveals a left sided hilar mass.

Which of the following would be an appropriate next step in the investigation of this patient?

- 1- Bronchoscopy
- 2- CT guided biopsy
- 3- Lymph node biopsy
- 4- PET scanning
- 5- Sputum cytology

Answer & Comments

Answer: 5- Sputum cytology

This patient is likely to have lung carcinoma.

A diagnosis may be made on sputum cytology which should be the initial investigation with a positive yield of approximately 70-80% with four samples.



[Q: 3161] OnExamination 2012 - Respiratory

A 68-year-old man presents with a one month history of dyspnoea and a 3 kg weight loss.

On examination there were signs of a large left pleural effusion, confirmed on chest x ray.

Investigations revealed:

Pleural fluid analysis:

Protein 38 g/L

Cytology a few lymphocytes and red blood cells.

Which one of the following investigations should be considered next?

- 1- Bronchoscopy
- 2- CT scan of thorax
- 3- Repeat pleural aspiration with biopsy
- 4- Thoracoscopic pleural biopsy
- 5- Tuberculin test

Answer & Comments

Answer: 2- CT scan of thorax

We assume from the given information that the patient is not symptomatic - in which case a further therapeutic pleural aspiration should be performed. The next most important step would be a contrast CT thorax which can help differentiate between benign and malignant disease and also guide further investigations.

Video-assisted thoracoscopic surgery (VATS) can

Do good pleural biopsies

Clear all the pleural fluid

Allow pleurodesis to prevent recurrence.

It should be considered after other non-invasive tests have proven negative. Usually the surgeons can do bronchoscopy at the same time under general anaesthetic.

Percutaneous pleural biopsies do not produce good samples and are less often done.

BTS guidelines for the investigation of a unilateral pleural effusion in adults.



[Q: 3162] OnExamination 2012 - Respiratory

A 45-year-old solicitor had an onset of severe, crushing, substernal chest pain while attending a football match. He collapsed on his way to the car.

Bystander cardiorespiratory resuscitation was begun immediately and he is cardioverted for VF by the attending paramedics. He arrives intubated and ventilated in the casualty department where his 12 lead ECG shows inferior ST elevation.

Blood gas analysis revealed:

pH 7.13(7.35-7.45)

paO₂ 560 mmHg(90-110)

paCO₂ 18 mmHg(35-45)

Bicarbonate 5.8 mmol/l (20-30)

SaO₂ 98%(>90)

Based on these laboratory values, which of the following statements best describes his current pathophysiology?

- 1- He has a large right to left intracardiac shunt
- 2- He is demonstrating a primary respiratory acidosis
- 3- His anion gap is likely to be normal
- 4- His oxyhaemoglobin curve is shifted to the left

- 5- His pulmonary artery pressure is likely to be elevated

Answer & Comments

Answer: 5- His pulmonary artery pressure is likely to be elevated

This relatively young patient with severe central chest pain has probably arrested due to myocardial infarction and arrhythmia.

His gases reveal high PO₂ following 100% O₂ but severe acidosis due to the arrest and lactic acidosis thus the anion gap would be high.

He does not have a primary ventilatory failure as his PO₂ is high.

There is unlikely to be large right to left shunting as this would cause hypoxaemia/cyanosis which does not correct with oxygen supplementation.

The oxygen dissociation curve is shifted to the right in acute acidosis, i.e. haemoglobin has a decreased affinity for oxygen.

High pulmonary pressures would be expected after this arrest scenario, as the pulmonary arterioles constrict in response to hypoxia.



[Q: 3163] OnExamination 2012 - Respiratory

The parents of a child with cystic fibrosis (CF) consult you wishing to know what is the risk of their next child being a carrier of the condition.

Which one of the following percentages is the correct risk?

- 1- 0%
- 2- 25%
- 3- 50%
- 4- 75%
- 5- 100%

Answer & Comments

Answer: 3- 50%

As both parents are carriers of the CF gene then the chance of another child being affected (homozygote) is 1 in 4 (25%).

The chance of their child being free from the CF gene is also 1 in 4 (25%) and the chance of a child being a carrier (heterozygote) is 1 in 2 (50%).



[Q: 3164] OnExamination 2012 - Respiratory

A 24-year-old asthmatic female is admitted with acute severe asthma.

Which of the following statements regarding the diagnosis is correct?

- 1- A high inspired oxygen concentration should be used routinely
- 2- Agitation should be managed with a benzodiazepine
- 3- Inhaled salmeterol is indicated as first line therapy
- 4- Normal arterial pCO₂ is reassuring
- 5- Pulsus paradoxus is a reliable sign of severity

Answer & Comments

Answer: 1- A high inspired oxygen concentration should be used routinely

A normal or raised arterial pCO₂ is an indication of severe asthma.

Pulsus paradoxus is not reliable and is not part of the criteria in assessing severity of asthma attack.

Salmeterol is used in management of chronic asthma (step 3).

High dose oxygen (40-60%) should be used in severe asthma attack, together with steroids and nebulised bronchodilators.

Sedation must be avoided as it can cause respiratory failure and arrest.



[Q: 3165] OnExamination 2012 - Respiratory

A 37-year-old patient presents with dyspnoea and right pleuritic chest pain.

He previously had right pneumothorax eight months ago for which he had a chest drain. He works as plumber. He is an ex-smoker.

On examination he had decreased air entry on right side and hyper-resonance. A CXR confirms a large pneumothorax. A chest drain was inserted and the lung completely re-expanded.

What is the best plan of action?

- 1- Advise bed rest for two weeks and then repeat CXR
- 2- Chemical pleurodesis through the chest drain
- 3- Recheck if he still smokes and advise to quit.
- 4- Remove drain and discharge
- 5- Video assisted thoracoscopic surgery

Answer & Comments

Answer: 5- Video assisted thoracoscopic surgery

Video assisted thoracoscopic surgery is indicated in:

Second ipsilateral pneumothorax

Bilateral spontaneous pneumothorax

Spontaneous haemothorax

Persistent air leak (more than five to seven days of drainage)

Certain occupations, for example, pilots or divers.

Chemical pleurodesis is used in older patients with recurrent pneumothorax, where surgery

would be high risk. Failure rates can be 10-20%.



[Q: 3166] OnExamination 2012 - Respiratory

A 26-year-old patient presented to the Emergency department with severe shortness of breath.

His BP drops to 80/50 mmHg. He is tachycardic and apyrexial. His O₂ sat is 74%. Examination has revealed raised JVP and trachea deviated to the left side.

What is the immediate next step?

- 1- Aspirate left side of chest using a large bore cannula
- 2- Insert a chest drain on the left side
- 3- Insert a chest drain on the right side
- 4- Request an urgent portable CXR and administer high flow O₂ while waiting
- 5- Request urgent arterial blood gases

Answer & Comments

Answer: 3- Insert a chest drain on the right side

Pneumothorax can be classified as either primary or secondary. However, more important in this case is the presence of tension.

Tension pneumothorax results from progressive build-up of air within the pleural space, which is not able to return. This build-up of pressure pushes the mediastinum to the opposite hemithorax and obstructs venous return. The patient then develops severe breathlessness, hypotension, mediastinal shift and, ultimately, cardiac arrest (often electromechanical dissociation: PEA). The classical signs of a tension pneumothorax are deviation of the trachea away from the side of tension, hyper-expanded chest that moves minimally with respiration and increased percussion note. JVP may be raised. However,

more commonly the only signs are tachycardia, tachypnoea and hypoxia.

Management of tension pneumothorax is immediate chest decompression with needle thoracostomy. A 14-16G intravenous cannula is inserted into the second rib space in the mid-clavicular line, on the side of the pneumothorax. By acting as a valve, this converts a tension pneumothorax into a simple pneumothorax.

Definitive treatment of a tension pneumothorax is chest drain insertion. This is usually done in the Emergency department with ultrasound guidance. Once the pleura is entered, the tension is relieved and the remainder of the procedure can be undertaken with less time pressure.

In this case, the option of needle thoracostomy is on the incorrect side, so the correct option is inserting a chest drain on the right side. High-flow oxygen is indicated whilst performing this, and chest x-ray should be ordered to check the position of the drain. Arterial blood gases may be indicated once the drain is in situ.

Although the above explanation remains correct for the MRCP examination, it is important to be aware that there has been discussion about the use of needle thoracostomy in the medical literature. It has been shown that on occasion it is ineffective in relieving a tension pneumothorax, especially in patients who have very thick chest walls. In addition they are prone to blockage, kinking and dislodging, and can cause a lung laceration which subsequently can lead to air embolisation (especially if a pneumothorax was not present). Some groups are therefore recommending an urgent chest x-ray if there is no haemodynamic compromise.



[Q: 3167] OnExamination 2012 - Respiratory

A 62-year-old man comes to the respiratory clinic. He was diagnosed with COPD several years ago.

He is on regular steroid inhalers, long acting B2 agonist and ipratropium. He has been discharged from hospital following an infective exacerbation two weeks ago.

On examination he is afebrile and his chest is clear. His FEV₁ is 1.2 L. His blood gases on air show the following:

pH 7.4(7.35-7.45)

pCO₂ 5.5 kPa (4.7-6.0)

paO₂ 7.3 kPa (11.3-12.6)

He stopped smoking six months ago.

Which of the following will you consider?

- 1- Discharge from clinic
- 2- Give a course of oral steroids
- 3- Prescribe oral antibiotics
- 4- Repeat blood gases on air in three months
- 5- Start LTOT (long term oxygen therapy).

Answer & Comments

Answer: 4- Repeat blood gases on air in three months

Indications of LTOT in the United Kingdom:

PO₂ <7.3 kPa on air (O₂ saturation <88%) in a stable clinical state. Borderline results should be repeated in three months.

PO₂ 7.3 - 8 kPa if there is pulmonary hypertension, polycythaemia, or additional nocturnal hypoxaemia.

Blood gases should be performed in a stable state, which should be at least four weeks after an exacerbation of the disease.

There is no indication in this scenario for steroids or antibiotics.



[Q: 3168] OnExamination 2012 - Respiratory

A 25-year-old Afro-Caribbean patient presents to the GP with a progressive history of dyspnoea and a cough.

She is initially treated for possible asthma but this fails to alleviate symptoms. The GP organises a CXR and spirometry. The CXR is reported as bilateral hilar lymphadenopathy and upper lobe pulmonary infiltrates.

On review in the chest clinic, spirometry shows a mild restrictive defect and serum angiotensin converting enzyme (SACE) is positive. She is diagnosed with pulmonary sarcoidosis.

What is the stage (radiological) of her disease?

- 1- Stage 0
- 2- Stage I
- 3- Stage II
- 4- Stage III
- 5- Stage IV

Answer & Comments

Answer: 3- Stage II

Chest x ray is abnormal in 85% of lung sarcoid, but 30-60% are asymptomatic (that is, incidental chest x ray finding).

Stage	Finding	Likelihood of spontaneous resolution
0	Normal chest radiograph	>90%
I	Bilat hilar lymphadenopathy (BHL)	60-90%
II	BHL plus pulmonary infiltrates	40-60%
III	Pulmonary infiltrates (no BHL)	10-20%
IV	Pulmonary fibrosis (+/- bullae)	<20%



[Q: 3169] OnExamination 2012 - Respiratory

A 17-year-old patient with known atopic asthma presents to the Emergency department with an acute asthma attack.

He had been over at his friend's house playing with his dog about 10 minutes before he felt wheezy and short of breath. He is given bronchodilators and has a good response. He is discharged later that day following a period of observation with an asthma management plan.

Which of the below immunomodulators is involved in this immediate response (bronchoconstriction)?

- 1- Eosinophil catatonic protein (ECP)
- 2- Leukotriene C4 (LTC4)
- 3- Major basic protein (MBP)
- 4- Platelet activating factor (PAF)
- 5- TH2 lymphocytes

Answer & Comments

Answer: 2- Leukotriene C4 (LTC4)

Inhalation of allergens by individuals with atopic asthma initiates an immediate bronchoconstriction reaction. This usually subsides within two hours and is reversible with bronchodilators.

This is an example of type I hypersensitivity and is caused by degranulation of mast cells and release of histamine, prostaglandin D2 and leukotriene C4 and D4.

The other immunomodulators listed form part of the late phase (or type IV hypersensitivity) response which results in bronchoconstriction, airways inflammation, hyper-responsiveness and oedema. This typically occurs three to 12 hours after the immediate response and is less susceptible to bronchodilators.

The increased hypersensitivity may promote recurrent asthma attacks over the following days.



[Q: 3170] OnExamination 2012 - Respiratory

A known case of chronic obstructive pulmonary disease (COPD) presents to the Emergency department, distressed and cyanosed.

Arterial blood gases reveal:

pH 7.2(7.36-7.44)

paO₂ 8.3 kPa(11.3-12.6 kPa)

paCO₂ 10 kPa(4.7-6.0 kPa)

He is given high concentration oxygen together with a salbutamol nebuliser. Intravenous hydrocortisone is also given.

The patient becomes even worse with poorer breathing effort although pulse oximetry showed SaO₂ of 93%.

What is the cause of patient's deterioration?

- 1- Constriction of bronchioles in response to salbutamol nebuliser
- 2- High concentration oxygen administration
- 3- Pulmonary artery relaxation causing mismatch between perfusion and ventilation
- 4- Pulmonary vein relaxation causing mismatch between perfusion and ventilation
- 5- Reaction to IV hydrocortisone

Answer & Comments

Answer: 2- High concentration oxygen administration

The patient was suffering from hypoxia and hypercapnia as a result of acute exacerbation of COPD.

His respiratory centre was solely stimulated by hypoxia. That is why his respiratory effort

became less and the condition worsened when he was given high concentration oxygen, depriving him of hypoxic drive.



[Q: 3171] OnExamination 2012 - Respiratory

A 45-year-old female presents with a six month history of exertional dyspnoea and is diagnosed with pulmonary fibrosis (PF).

Over the last one year she has received a variety of medications.

Which of the following drugs could be responsible?

- 1- Dexamethasone
- 2- Ibuprofen
- 3- Nalidixic acid
- 4- Penicillamine
- 5- Sulfasalazine

Answer & Comments

Answer: 5- Sulfasalazine

Sulfasalazine as well as other rheumatology drugs such as gold and methotrexate can cause pulmonary fibrosis.

Bleomycin and cyclophosphamide rather than vincristine may be responsible.

Corticosteroids are sometimes given as a trial in pulmonary fibrosis.

Nalidixic acid is associated with seizures and visual disturbances. However nitrofurantoin is well recognised to cause PF.

Other drugs include amiodarone and nitrofurantoin.



[Q: 3172] OnExamination 2012 - Respiratory

A 56-year-old female presents with a six month history of deteriorating non-productive cough and exertional dyspnoea.

On examination she is noted to be cyanosed, has clubbing of the fingers and there are bilateral basal crackles.

A chest x ray reveals bilateral basal shadowing and pulmonary investigations show:

paO₂ (on air) 8.5 kPa (11.5-12.5)

FEV₁/FVC ratio 85%

Which one of the following investigations is most likely to establish the diagnosis?

- 1- Bronchoalveolar lavage
- 2- Chest CT scan
- 3- Diffusion capacity studies
- 4- Echocardiography
- 5- Serum ACE level

Answer & Comments

Answer: 2- Chest CT scan

This patient has restrictive lung disease, most likely cryptogenic fibrosing alveolitis. The cardinal features are breathlessness and cyanosis; clubbing occurs in two-thirds of cases.

She is hypoxic on air, has a restrictive ventilatory defect, and a high resolution CT scan of the chest will show typical changes.



[Q: 3173] OnExamination 2012 - Respiratory

A 60-year-old woman presents with deteriorating dyspnoea and cough productive of a purulent sputum. She has a two year history of recurrent chest infections and is a smoker of 15 cigarettes daily for the last 30 years.

On examination, she appeared breathless with a pulse of 100 bpm and her temperature was 39°C.

Investigations revealed:

Haemoglobin 19.5 g/dl(11.5-16.5)

White cell count 15.7 x 10⁹/L (4-11)

Platelet count $350 \times 10^9/L$ (150-400)

paO₂ 6.8 kPa (11.3-12.6)

CarboxyHaemoglobin 15.5%(3-15)

Red cell mass 147%(75-125)

What is the most likely explanation for these findings?

- 1- Chronic obstructive airways disease
- 2- Ectopic erythropoietin production
- 3- Myelofibrosis
- 4- Primary polycythaemia
- 5- Pseudo-polycythaemia

Answer & Comments

Answer: 1- Chronic obstructive airways disease

This patient has polycythaemia which is likely to be secondary to her hypoxia.

The cause of the hypoxia is most likely to be due to chronic obstructive pulmonary disease as a result of her heavy smoking history. Her history of increasing breathlessness, cough and sputum production and recurrent chest infections is consistent with this diagnosis.

The treatment is for her to stop smoking and long term oxygen therapy (LTOT) (that is, oxygen for more than 15 hours/day), should the hypoxia be confirmed when fully recovered from this exacerbation.

The indications for LTOT are:

paO₂ < 7.3 kPa (55 mmHg) or

paO₂ < 8.0 kPa (60 mmHg)

with evidence of pulmonary hypertension, peripheral oedema or polycythaemia.



[Q: 3174] OnExamination 2012 - Respiratory

A 15-year-old boy presented with wheezing when playing football and nocturnal cough.

Which is the best test to confirm the underlying condition?

- 1- A trial of inhaled corticosteroids
- 2- A trial of inhaled salbutamol
- 3- A trial of oral corticosteroids
- 4- Serial peak expiratory flow rate measurements
- 5- Spirometry alone

Answer & Comments

Answer: 4- Serial peak expiratory flow rate measurements

Demonstration of variable obstruction of the airways provides good evidence for asthma, with its characteristic morning dips.

Failure to respond to bronchodilator therapy does not exclude asthma as response may be small in children, and in adults with persistent or more severe asthma.

Those who fail to respond to inhaled bronchodilator require a steroid trial (either four weeks of high dose inhaled steroids or two weeks of oral prednisolone).



[Q: 3175] OnExamination 2012 - Respiratory

Which of the following is a recognised cause of a phrenic nerve palsy?

- 1- Aortic aneurysm
- 2- Dermoid
- 3- Ganglioneuroma
- 4- Pericardial cyst
- 5- Sarcoidosis

Answer & Comments

Answer: 1- Aortic aneurysm

The diaphragm is innervated by the phrenic nerve (C3,4,5).

Palsy is a recognised complication of thoracic surgery, infection, Guillain-Barre or invasion by an adjacent tumour.

It may also be stretched by an aortic aneurysm.



[Q: 3176] OnExamination 2012 - Respiratory

A 61-year-old man presents with a four day history of dry cough and increasing confusion. He has also suffered diarrhoea and headaches which have increased in severity over the past day.

Past history of hypertension for which he takes perindopril and indapamide is noted as is recent travel to a medical convention in Spain.

On examination his BP is 110/70 mmHg, pulse is 92, he is pyrexial 38.2 C. There are coarse basal crackles bilaterally and signs of a left sided pleural effusion.

Investigations show:

Haemoglobin 13.7 g/dl(13.5-17.7)

White cell count $11.9 \times 10^9/L$ (4-11)

Platelets $173 \times 10^9/L$ (150-400)

Sodium 133 mmol/l (135-146)

Potassium 4.8 mmol/l (3.5-5)

Creatinine 132 micromol/l (79-118)

Alanine aminotransferase 180 U/l (5-40)

Alkaline phosphatase 220 U/l (39-117)

CXR - Patchy bilateral consolidation, left pleural effusion.

Which of the following is the best treatment for him?

- 1- Benzyl penicillin
- 2- Ciprofloxacin
- 3- Clarithromycin
- 4- Doxycycline
- 5- Rifampicin

Answer & Comments

Answer: 3- Clarithromycin

The history of recent travel to a convention, coupled with pneumonia with patchy consolidation, a pleural effusion, hyponatraemia, diarrhoea and non-specific LFT changes raises the possibility of legionnaire's disease.

Macrolides are appropriate first line therapy for the condition, therefore clarithromycin is the logical first choice antibiotic.

Legionella is not sensitive to penicillin, therefore benzyl penicillin is an inappropriate choice in this case.

Both doxycycline and ciprofloxacin are reasonable second line choices for the treatment of Legionella.

Legionella resistance to rifampicin is noted, therefore this is not a first line option.

A small recent study also noted increased liver function abnormalities in patients with legionnaire's exposed to rifampicin.



[Q: 3177] OnExamination 2012 - Respiratory

A 45-year-old woman solicitor presents with shortness of breath and a dry cough. She has been treated by her GP with a salbutamol inhaler but tells you that this has made no difference at all to her symptoms.

In addition she has an itchy raised rash on both shins. On examination her BP is 145/82 mmHg, pulse is 80 and regular. Her BMI is 28. Lungs appear normal on auscultation. There is a rash on her shins consistent with erythema nodosum.

Which of the following investigations is most likely to confirm the diagnosis?

- 1- AAFB staining
- 2- Bronchoalveolar lavage
- 3- CT thorax

4- Serum ACE

5- Transbronchial biopsy

Answer & Comments

Answer: 5- Transbronchial biopsy

AAFB staining would be confirmatory for a diagnosis of tuberculosis.

Given this woman is a solicitor, it is less likely she has had significant TB exposure versus sarcoidosis.

Bronchoalveolar lavage may demonstrate increased lymphocytes, although this is a non-specific finding.

Serum ACE is raised in 60% of patients with sarcoidosis.

Transbronchial biopsy is therefore the definitive route to confirming the diagnosis



[Q: 3178] OnExamination 2012 - Respiratory

A 72-year-old ex-miner with a significant smoking history and proven diagnosis of COPD, is attending chest clinic for review. He currently takes only a short acting beta agonist (salbutamol).

His last FEV₁ was 45%. He feels his symptoms are not currently controlled on his current drug regime.

According to the latest guidelines, what changes should be made to his medication?

- 1- Inhaled corticosteroid (ICS)
- 2- Long acting beta agonist (LABA)
- 3- Long acting beta agonist and inhaled corticosteroid
- 4- Long acting beta agonist and inhaled corticosteroid and long acting muscarinic agonist.
- 5- Long acting muscarinic agonist (LAMA) and long acting beta agonist

Answer & Comments

Answer: 3- Long acting beta agonist and inhaled corticosteroid

NICE have recently published guidelines for the management of chronic obstructive pulmonary disease (COPD).

Initially a short acting beta agonist or a short acting muscarinic agonist is advised. However if the patient is persistently breathless or has exacerbation, then additional therapy should be offered.

This will depend on the FEV₁. If greater than 50%, NICE recommends the addition of either a LABA or LAMA. If FEV₁ is less than 50%, NICE recommends either a LABA plus an inhaled corticosteroid (in a combination device) or a LAMA.

If exacerbations continue despite this management, then a combination of all three (LABA, ICS and LAMA) should be trialled.

Full guidelines can be found at:

<http://www.nice.org.uk/nicemedia/live/13029/49399/49399.pdf>



[Q: 3179] OnExamination 2012 - Respiratory

A 19-year-old girl with known cystic fibrosis is under regular follow up at her local specialist centre.

Which one the following conditions associated with cystic fibrosis is she most likely also to have?

- 1- Biliary cirrhosis
- 2- Infertility
- 3- Nasal polyps
- 4- Pancreatic Insufficiency
- 5- Sinusitis

Answer & Comments

Answer: 4- Pancreatic Insufficiency

Pancreatic insufficiency is very common, with 85% of patients affected.

Almost all male CF patients will be infertile; but there is only a 20% incidence amongst female patients. Almost 100% of children with cystic fibrosis will have delayed development and puberty.

Biliary cirrhosis is far rarer with approximately 5% of adults affected.

Dysfunctional gallbladder and gallstones can be seen in 10-30% of cases.

Symptomatic sinusitis is seen in 10% of children and 20% of adult patients.

Nasal polyps are less common with an estimated incidence of 15-20% (most of these occurring in the second decade).

Other associated conditions include vitamin D deficiency resulting in bone demineralisation, hypertrophic osteoarthropathy and rectal prolapse.



[Q: 3180] OnExamination 2012 - Respiratory

A 65-year-old man with severe COPD is suspected of having pulmonary hypertension (PH) secondary to his underlying lung disease. Following an echocardiogram which was inconclusive, a right heart catheterisation is organised.

Which of the listed values of mean arterial pressure taken at rest is the lowest value associated with a diagnosis of pulmonary hypertension?

- 1- >10 mmHg
- 2- >14 mmHg
- 3- >18 mmHg
- 4- >20 mmHg
- 5- >25 mmHg

Answer & Comments

Answer: 5- >25 mmHg

Pulmonary hypertension is defined as a mean pulmonary arterial (PA) pressure of more than 25 mmHg at rest or more than 30 mmHg during exercise. The normal value is 14 mmHg.

A rise in PA pressure can be due to increased pulmonary vascular resistance (for example, embolism or hypoxia), pulmonary blood flow and back pressure (as seen in left heart failure).

It is most commonly caused by another disorder (secondary PH).

However it may be a disorder of the pulmonary circulation itself (pulmonary arterial hypertension), although this is less common.



[Q: 3181] OnExamination 2012 - Respiratory

A 32-year-old presents to the Emergency department of her local hospital.

She is complaining of increasing breathless on exertion over the last few weeks. She also reports a dry cough and occasional night sweats. Of note, she is under the care of the infectious disease team for HIV and is also 28 weeks pregnant.

Examination reveals that she is hypoxic, with her oxygen saturations falling still when she is asked to walk. A departmental chest x ray demonstrates bilateral infiltrates.

What is the most appropriate antibiotic treatment for this patient given the likely diagnosis?

- 1- Amphotericin
- 2- Clindamycin and primaquine
- 3- Pentamidine
- 4- Rifampicin, ethambutol, isoniazid, pyrazinamide
- 5- Trimethoprim sulfamethoxazole (TMP-SMX)

Answer & Comments

Answer: 5- Trimethoprim sulfamethoxazole (TMP-SMX)

Although Pneumocystis pneumonia (PCP) is officially a fungal infection it does not respond to anti-fungal medications.

Trimethoprim-sulfamethoxazole (TMP-SMX/ co-trimoxazole/ Septrin) has been shown to be as effective as intravenous pentamidine and more effective than other alternative treatment regimens.

TMP-SMX is the preferred initial therapy during pregnancy according to consensus guidelines.

For the treatment of infections that are resistant to TMP-SMX, the combination of clindamycin and primaquine is likely to be more effective than intravenous pentamidine¹.

Rifampicin, ethambutol, isoniazid, pyrazinamide are the first line drugs to treat tuberculosis (TB). Although this woman is at risk from TB infection, the clinical history is more in keeping with a diagnosis of PCP.

Adjuvant steroid therapy is indicated in patients with severe PCP infection who have underlying HIV infection.

Pneumocystis (carinii) jiroveci Pneumonia emedicine.



[Q: 3182] OnExamination 2012 - Respiratory

A 36-year-old man complains of a persistent cough.

A CXR shows fibrosis of both upper lobes.

What is the most likely diagnosis?

- 1- Allergic bronchopulmonary aspergillosis
- 2- Ankylosing spondylitis
- 3- Cystic fibrosis
- 4- Primary pulmonary hypertension

5- Systemic sclerosis

Answer & Comments

Answer: 1- Allergic bronchopulmonary aspergillosis

The persistent cough is likely to be a symptom of asthma.

On the other hand, only about 1% of patients with advanced ankylosing spondylitis develop apical fibrosis, that is, it is rare. Even then, early lesions are asymptomatic.

It is only when cavitation develops that symptoms like cough, infected sputum and haemoptysis start.

With ABPA, fibrosis and loss of volume in the upper lobes are common. Within these upper lobes, there may be bronchiectasis.



[Q: 3183] OnExamination 2012 - Statistics

A large multi-centre secondary prevention study reports a reduction in the annual incidence of recurrent subarachnoid haemorrhage from 10% in a medically treated group to 6% in the group treated with medical therapy plus radiological intervention ($p < 0.005$). The additional cost of the new treatment is £3000 per patient.

In the first year of treatment, what would be the predicted additional cost of preventing a single recurrent subarachnoid haemorrhage?

- 1- £3000
- 2- £12 000
- 3- £30 000
- 4- £75 000
- 5- £90 000

Answer & Comments

Answer: 4- £75 000

This study shows that annual rate of recurrent subarachnoid haemorrhage is reduced from 10% to 6%.

Therefore, if you treated 100 patients for one year you would expect 10 patients with subarachnoid haemorrhage in the medically treated group versus six patients in the medical plus radiological intervention group - a reduction of four patients per hundred.

Therefore you would need to treat 25 patients (4/100) to expect one less case of subarachnoid haemorrhage.

Thus the extra cost of this would be $25 \times 3000 = £75\,000$.



[Q: 3184] OnExamination 2012 - Statistics

A new treatment for osteoarthritis has been developed and shown to be effective in animal

models plus its effects in small numbers of patients appears promising.

However, there are some concerns with regard to possible hepatotoxicity but no cases have been observed in studies thus far.

Which is the most appropriate next step in this drug's development?

- 1- Case control study
- 2- Double blind randomised placebo controlled study
- 3- Drug development should be suspended due to the hepatotoxicity
- 4- Open label study
- 5- Single blind randomised placebo controlled study

Answer & Comments

Answer: 2- Double blind randomised placebo controlled study

This drug has completed animal trials and has been tested in human volunteers (phase 1) and has also been tried in patients (phase 2).

Thus the next stage in its development is a phase 3 study and the best phase 3 study would be a randomised control study.



[Q: 3185] OnExamination 2012 - Statistics

A study of an established antihypertensive agent against placebo reports that the risk of death due to cardiac causes is lower on treatment.

It gives five year mortality due to cardiac causes as 12% on placebo and 8% on treatment. The authors conclude that 'a 33% reduction in cardiac deaths is seen with treatment'.

The figure '33%' represents which of the following?

- 1- Absolute risk reduction
- 2- Control event rate

- 3- Experimental event rate
- 4- Number needed to treat
- 5- Relative risk reduction

Answer & Comments

Answer: 5- Relative risk reduction

An understanding of quantities discussed in 'evidence-based medicine' is becoming increasingly important for the examination.

If a drug reduces the incidence of heart attacks from 12% to 8% then:

The control event rate (CER) is 12%

The experimental event rate (EER) is 8%

The relative risk reduction (RRR) is 33% $[(EER - CER) / CER] \times 100$

The absolute risk reduction (ARR) is 4% $(CER - EER)$

The number needed to treat (NNT) is 25 $[1 / ARR] \times 100$



[Q: 3186] OnExamination 2012 - Statistics

In significance testing which of these statements is correct?

- 1- A type I error is to reject the alternative hypothesis when it should be accepted.
- 2- A type II error is to accept the alternative hypothesis when it should be rejected.
- 3- The probability associated with a type I error is the significance level.
- 4- The significance level is determined at the end of a significance test.
- 5- The significance level is always set to 5%.

Answer & Comments

Answer: 3- The probability associated with a type I error is the significance level.

The null hypothesis is that there is no difference between two groups.

The alternative hypothesis is that there is a difference.

Rejecting the null hypothesis when there really is no difference between the two groups is a type 1 error.

Accepting the null hypothesis (rejecting the alternative hypothesis) when there is a difference is a type 2 error.

Rejection of the null hypothesis depends on the probability - significance level which is usually (but not always) at $p < 0.05$.
Hypothesis testing



[Q: 3187] OnExamination 2012 - Statistics

A study of the intellectually handicapped was performed.

The 112 subjects put through programme A showed an increase in their mean IQ score of 6 points.

The 115 subjects put through programme B showed an increase in their mean IQ score of 4.

The p value was >0.05 .

Which of the following is true?

- 1- The numbers are too large for a Student's t test
- 2- The study demonstrates the usefulness of programme A
- 3- The distribution of individual values is not important
- 4- Even though the difference between the means is not significant it would be appropriate to calculate confidence intervals
- 5- The above results would be found by chance in less than 1:20

Answer & Comments

Answer: 4- Even though the difference between the means is not significant it would be appropriate to calculate confidence intervals

A. The t test could be used in the comparison of data and the larger the sample size the more meaningful the data.

B. A is no more useful than B or even simply repeating an IQ test.

C. and D. This gives us an idea of the distribution of the data. Confidence intervals may provide more meaningful data concerning the study.

E. The chances are greater than 1 in 20 as P is greater than 0.05.



[Q: 3188] OnExamination 2012 - Statistics

A publication assesses a new diagnostic test for thyroid cancer.

Which of the following terms would reflect the number of cases of thyroid cancer correctly identified by this new test?

- 1- Accuracy
- 2- Negative predictive value
- 3- Positive predictive value
- 4- Sensitivity
- 5- Specificity

Answer & Comments

Answer: 4- Sensitivity

The specificity of a test is the probability that a test will produce a true negative result when used on an unaffected population.

The sensitivity of a test is the probability that it will produce a true positive result when used on an affected population (as determined by a reference or "gold standard").

The positive predictive value of a test is the probability that a person is affected when a positive test result is observed.

The negative predictive value of a test is the probability that a person is not affected when a negative test result is observed.

Accuracy is expressed through the above four parameters.



[Q: 3189] OnExamination 2012 - Statistics

A new antiplatelet agent has been proven to reduce the risk of stroke in a year from 10% in patients treated with conventional treatment to 6% in patients treated with conventional treatment plus the new agent.

The cost of this new drug is £100 per month.

How much extra would a hospital need to spend to prevent one stroke?

- 1- £1200
- 2- £6000
- 3- £18000
- 4- £30000
- 5- £100000

Answer & Comments

Answer: 4- £30000

The 'absolute risk reduction' is $10\% - 6\% = 4\%$.

The 'number needed to treat' to prevent a stroke therefore equals $100 / 4 = 25$.

25 patients would need to be treated at a cost of £100/month for 12 months to prevent a stroke which gives the total cost as £30 000.



[Q: 3190] OnExamination 2012 - Statistics

In a study of elderly patients with atrial fibrillation, patients receiving warfarin (n=6000), 6% had strokes or died as a consequence of stroke, whereas in subjects

treated with aspirin (n = 8000), 9% had strokes or death from a stroke over the three year study period (p=0.001). The risk of stroke in an untreated population with atrial fibrillation over this time was 12%.

Which of the following percentages is the approximate annual incidence of stroke in the treated population in this study?

- 1- 2.6%
- 2- 3.3%
- 3- 5.5%
- 4- 6.9%
- 5- 7.7%

Answer & Comments

Answer: 1- 2.6%

One needs to calculate the incidence as follows:

In the group treated with warfarin there were 360 strokes (6% of 6000).

In the aspirin treated group there were 720 strokes (9% of 8000).

Thus, there are 1080 strokes amongst the treated population (n=14000) over a three year time period.

Therefore there are 360 strokes annually in the treated group (14000) giving an annual incidence of stroke of approximately 2.6%

Note: remember to divide by three since the study lasted three years and the figures given are for the three years incidence rates.



[Q: 3191] OnExamination 2012 - Statistics

A new test is developed for the diagnosis of HIV.

Blood from 10,000 patients was analysed by the gold standard technique and by the new method. There were 100 positive results with

the gold standard technique but there were 150 positive results using the new technique.

Approximately which of the following values reflects the positive predictive value of the new technique?

- 1- 33%
- 2- 50%
- 3- 66%
- 4- 75%
- 5- 90%

Answer & Comments

Answer:

It cannot be determined Correct

The positive predictive value is number of true positives/(no of true positives + false positives).

There are 100 people tested positive with gold standard. However, we don't know how many of these are tested positive and how many are tested negative by the new techniques. Similarly, we don't know the number of people tested positive or negative by the gold standard among the 150 people tested positive by the new technique. Therefore, the number of true positives and false positives and hence the positive predictive value cannot be determined.



[Q: 3192] OnExamination 2012 - Statistics

In a study of 1000 subjects with adrenal incidental tumours a new serological marker for adrenal carcinoma was assessed against formal histology.

The following results were obtained:

Test positive Test negative

Histology positive 40 10

Histology negative 50 900

To what does the specificity approximate?

- 1- 50%
- 2- 60%
- 3- 70%
- 4- 80%
- 5- 90%

Answer & Comments

Answer: 5- 90%

Sensitivity relates to the probability that the person with a disease will be correctly identified with the disease.

Therefore in this study 50 subjects have adrenal carcinoma of whom 40 are correctly identified with the disease giving a sensitivity of 80%.

The specificity is the probability that a person without the disease will be correctly identified by the test.

In this case there are 950 subjects without adrenal carcinoma of whom 900 were identified by the test - giving a specificity of ~95%.

Summary of sensitivity and specificity as defined by contingency tables.



[Q: 3193] OnExamination 2012 - Statistics

In a study of elderly patients with atrial fibrillation, patients receiving warfarin (n = 6000), were found to have a rate of stroke of 6%, whereas subjects treated with aspirin (n = 8000), had a stroke rate of 9.9% over the 3 year study period (p = 0.001). The risk of stroke in an untreated population with atrial fibrillation over this time was 12%.

To what do these numbers relate?

- 1- Absolute risk
- 2- Incidence
- 3- Odds risk
- 4- Prevalence

- 5- Relative risk

Answer & Comments

Answer: 2- Incidence

These numbers relate to the INCIDENCE of stroke occurring in the three populations over a specified period of time.

Prevalence is the numbers of patients with a specified disorder at any one time point.

Absolute risk reduction refers to the reduction in the number of patients with stroke following a specific intervention, e.g. ARR of stroke with warfarin vs aspirin is 3.3% over 3 years.

Relative risk reduction is $3.3 / 9.9 \times 100 = 33\%$.



[Q: 3194] OnExamination 2012 - Statistics

Which of the following are correct concerning an intention to treat analysis?

- 1- It is a study comparing the effects of treatment with placebo or active treatment and also a similar group of non-study participants
- 2- It is a study that analyses all patients randomised to the study
- 3- It is a study where all included patients are treated with the active drug
- 4- It is a study where all non-compliant patients are removed from analysis
- 5- It is a variation of a meta-analysis analysing specifically studies employing double blind placebo controlled trials

Answer & Comments

Answer: 2- It is a study that analyses all patients randomised to the study

When one considers a randomised study, although the principles of double blind placebo controlled may apply, the actual

preferential fall out of patients, for instance treated with placebo as they do not perceive a benefit, may itself introduce bias.

Thus, intention to treat studies would argue that one should commit all patients that originally participate in the study to analysis.

The advantages of this approach are that it maintains treatment groups that are similar apart from random variation. This is the reason for randomisation, and the feature may be lost if analysis is not performed on the groups produced by the randomisation process.

Secondly, it permits for non-compliance and deviations from policy by clinicians.



[Q: 3195] OnExamination 2012 - Statistics

In a study of blood pressures in a specific ethnic population, the researcher is concerned that his spread of blood pressures is larger than that described in the general population.

Which of the following terms most appropriately describes the spread of blood pressures?

- 1- Mean
- 2- Median
- 3- Mode
- 4- Standard deviation
- 5- Standard error of the mean

Answer & Comments

Answer: 4- Standard deviation

Standard deviation is a measure of the spread of observations about the mean.

It is based on the deviation of each observation from the mean value.

Each value is squared, summed and divided by the total number of observations less one.

The standard deviation is the square root of this value.



[Q: 3196] OnExamination 2012 - Statistics

In a trial of statin therapy in the secondary prevention of ischaemic heart disease, therapy is shown to reduce cardiovascular mortality from 12% to 8% over the five years duration of the study.

In comparison with standard therapy, what is the number of patients that needs to be treated to prevent one death over five years?

- 1- 5
- 2- 10
- 3- 20
- 4- 25
- 5- 50

Answer & Comments

Answer: 4- 25

The drug has reduced the risk of death post myocardial infarction by 4% over five years.

Therefore if 100 people were treated we could expect the prevention of four deaths.

Therefore in order to prevent one death, 25 individuals would need to be treated.



[Q: 3197] OnExamination 2012 - Statistics

A letter to a medical journal suggested that an established antidepressant may cause photosensitivity. The manufacturer wished to set up a study to determine rapidly and efficiently whether this was a true association.

Which one of the following techniques is most appropriate?

- 1- A case-control study
- 2- A dose ranging study

- 3- A double blind, randomised, placebo controlled study
- 4- A meta-analysis
- 5- A sequential trial

Answer & Comments

Answer: 4- A meta-analysis

A sequential trial is one in which the data are analysed after each participant's results become available, and the trial continues until a clear benefit is seen in one of the comparison groups, or it is unlikely that any difference will emerge.

The main advantage of sequential trials is that they will be shorter than fixed length trials when there is a large difference in the effectiveness of the interventions being compared. Their use is restricted to conditions where the outcome of interest is known relatively quickly.

In a case-control study, patients who have developed a disease are identified and their past exposure to aetiological factors is compared with that of controls who do not have the disease.

A double-blind randomised placebo controlled study does not seem appropriate in this case, and a dose-ranging study would be used in the early stages of drug development to identify common side effects, perhaps toxicity, and threshold efficacy doses.

The most appropriate study would probably be a meta-analysis. This is because:

The drug is in the market place

Large studies will have taken place in order for it to obtain its licence so the data are available relatively rapidly (compared with the other options in this question)

The analysis could be carried out efficiently (cheaply if one were being cynical), and

The results of the trial would also be available rapidly.



[Q: 3198] OnExamination 2012 - Statistics

A publication describes a new diagnostic test for myocardial infarction.

You want to know what proportion of patients with a confirmed myocardial infarction will be identified by the test.

Which one of the following measurements would indicate this?

- 1- Accuracy
- 2- Negative predictive value
- 3- Positive predictive value
- 4- Sensitivity
- 5- Specificity

Answer & Comments

Answer: 4- Sensitivity

The specificity of a test is the probability that a test will produce a true negative result when used on an unaffected population, whereas the sensitivity of a test is the probability that it will produce a true positive result when used on an affected population (as determined by a reference or "gold standard").

The positive predictive value of a test is the probability that a person is affected when a positive test result is observed. The negative predictive value of a test is the probability that a person is not affected when a negative test result is observed.

Accuracy is expressed through the above four parameters.



[Q: 3199] OnExamination 2012 - Statistics

The upper and lower limit of normal, of a biochemical test in the hospital laboratory, is two standard deviations of the population.

What percentage of the population is represented by two standard deviations?

- 1- 85%
- 2- 95%
- 3- 97%
- 4- 99%
- 5- 99.7%

Answer & Comments

Answer: 2- 95%

If one assumes that there is a normal distribution of this test in the population, then:

One standard deviation includes 68% of the population

Two standard deviations include approximately 95% of the population

Three standard deviations include 99.7% of the population.



[Q: 3200] OnExamination 2012 - Statistics

In a study of 950 subjects with a BMI below 25 kg/m², a new serological marker for coeliac disease was assessed against the gold standard test of jejunal biopsy.

The following results were obtained:

	Test positive	Test negative
Biopsy positive	40	10
Biopsy negative	60	840

What is the sensitivity of this test?

- 1- 40%
- 2- 55%
- 3- 66%
- 4- 80%
- 5- 93%

Answer & Comments

Answer: 4- 80%

Sensitivity relates to the probability that the person with a disease will be correctly identified with the disease. Therefore, in this study, 50 subjects have the disease, of whom 40 are correctly identified with the disease giving a sensitivity of 80%.

The specificity is the probability that a person without the disease will be correctly identified by the test. In this case, there are 900 subjects without the disease of whom 840 were identified by the test - giving a specificity of 93%.



[Q: 3201] OnExamination 2012 - Statistics

There is presently no known effective treatment for a chronic disease.

A new treatment is known to be effective in animal models and shows promise in short term studies in patients. There are some theoretical concerns regarding possible hepato- and bone marrow toxicity although, thus far, no toxicity has been observed in studies.

What is the most appropriate next step in the drug's development?

- 1- A case-control study
- 2- A randomised double-blind placebo-controlled study
- 3- A randomised single-blind placebo-controlled study
- 4- An open study
- 5- No further studies should be done and drug development should be stopped

Answer & Comments

Answer: 2- A randomised double-blind placebo-controlled study

It appears that the drug has undergone animal testing and we can surmise that it has also been tested on normal volunteers (phase 1) as we are told that it has been tried in short term studies of patients (phase 2).

After this testing process comes phase 3 studies - broad clinical trials designed to determine whether the drug is of clinical benefit in the disease state.

In particular you wish to know whether the drug is effective or not and you wish to know its safety.

A double-blind placebo-controlled study would be best placed to provide this information.



[Q: 3202] OnExamination 2012 - Statistics

A trial is proposed to see whether excess alcohol use is a risk factor for osteoporosis.

It is decided to perform a case-control study rather than a cohort study.

Which of these is an advantage of a case-control study?

- 1- It can provide information on a wide range of outcomes
- 2- It is expensive to perform
- 3- It is possible to measure the incidence of a disease directly
- 4- It is possible to study diseases that are rare
- 5- The time sequence of events can be assessed

Answer & Comments

Answer: 4- It is possible to study diseases that are rare

A case-control study compares the characteristics of a group of patients with the disease with a control group of patients who do not have the disease.

Advantages of case-control studies are that:

They are particularly suitable for rare diseases

A wide range of risk factors can be investigated

There is no loss to follow up

They are relatively cheap and quick to perform.

Results are usually quoted as an odds ratio.



[Q: 3203] OnExamination 2012 - Statistics

In a study of 26,000 females, 1300 subjects were found to have either overt or subclinical hypothyroidism.

Within this group, the risk of demonstrating either overt or subclinical hypothyroidism was therefore 5%.

What is the best descriptive term of this 5% risk?

- 1- Absolute risk
- 2- Incidence
- 3- Prevalence
- 4- Relative risk
- 5- Specificity

Answer & Comments

Answer: 3- Prevalence

This is the risk of either subclinical or overt hypothyroidism in a female population at any specific time which is the prevalence. This is defined as the rate of a disorder in a specified population at a specified time.

Incidence refers to the number of new cases of a disorder developing over a specific time.



[Q: 3204] OnExamination 2012 - Statistics

In a study of 1000 patients with autoimmune hepatitis a new serological test for the disease was assessed against diagnostic liver biopsy.

The following results were obtained:

	Test positive	Test negative
Histology positive	80	20
Histology negative	100	800

To what does the sensitivity of the new test approximate?

- 1- 50%
- 2- 60%
- 3- 70%
- 4- 80%
- 5- 90%

Answer & Comments

Answer: 4- 80%

Sensitivity relates to the probability that the person with a disease will be correctly identified with the disease.

Therefore in this study 100 subjects have autoimmune hepatitis of whom 80 are correctly identified with the new test giving a sensitivity of 80%.

The specificity is the probability that a person without the disease will be correctly identified by the test.

In this case, there are 900 subjects without autoimmune hepatitis of whom 800 were identified by the test - giving a specificity of ~89%.

Summary of sensitivity and specificity as defined by contingency tables.



[Q: 3205] OnExamination 2012 - Statistics

In a study to find out if concentration of drug X is related to weight, subjects were given 500 mg of the drug and serum levels were measured two hours later.

Which of the following is the best statistical test to evaluate the results?

- 1- Chi squared test
- 2- Log regression analysis
- 3- Pearson's coefficient
- 4- Student's paired t test
- 5- Student's unpaired t test

Answer & Comments

Answer: 3- Pearson's coefficient

Drug concentrations are measured two hours after consumption and the variable of weight is to be factored in on the drugs pharmacokinetics.

Therefore there are two variables to be compared and consequently the most appropriate statistical test would be Pearson's test.

Logistic regression is used to model dichotomous (0 or 1) outcomes. This technique models the log odds of an outcome defined by the values of covariates in your model.



[Q: 3206] OnExamination 2012 - Statistics

Which of the following would invalidate the use of the unpaired t test in the comparison of mean drug concentrations between two groups of subjects?

- 1- Insufficient statistical power
- 2- Non-normal distribution of data
- 3- Small sample size
- 4- Small standard error
- 5- Unequal sample sizes in both groups

Answer & Comments

Answer: 2- Non-normal distribution of data

The t test can only be used for parametric (normally distributed) data.

Insufficient statistical power as a consequence of numbers recruited would not invalidate the results of a t test.

It is probable that the results would be unlikely to show any difference with too few subjects, although it is possible that if the differences were large then irrespective of prior power calculations differences might be seen.



[Q: 3207] OnExamination 2012 - Statistics

A randomised double-blind placebo-controlled study of a cholesterol-lowering drug in the primary prevention of coronary heart disease was conducted over a five year follow up period. The absolute risk of myocardial infarction (MI) in the group receiving placebo during this time was 10%.

The relative risk of those given the cholesterol lowering medication was 0.8.

What number of patients will need to be treated with active drug for five years to prevent one myocardial infarction?

- 1- 20
- 2- 40
- 3- 50
- 4- 80
- 5- 100

Answer & Comments

Answer: 3- 50

The absolute risk of MI in the treatment group is $10\% \times 0.8 = 8\%$ (as they have a relative risk of 0.8 compared to the placebo group).

Number needed to treat (NNT) = $1 / \text{absolute risk reduction (ARR)}$.

ARR is the risk in control group - risk in treated group.

Therefore the ARR is $10\% - 8\%$ and the NNT for that period is $1 / 0.02 = 50$.



[Q: 3208] OnExamination 2012 - Statistics

Which of the following statements is correct regarding standard error of the mean (SEM) and standard deviation (SD)?

- 1- Standard deviation invariably falls with increasing sample size
- 2- Standard deviation may be greater than the mean even if all values are positive numbers
- 3- Standard error of mean increases with sample size
- 4- Standard error of mean is calculated by taking the square root of the standard deviation of the sample means
- 5- Student's t test is a non-parametric test

Answer & Comments

Answer: 2- Standard deviation may be greater than the mean even if all values are positive numbers

The standard error of the mean = SD / \sqrt{n} .

SD does not necessarily fall with sample size, as the distribution of values may increase and hence SD increase. SEM would decrease with sample size as can be seen in the above calculation.

The SD is greater than the mean if the sample values are negative. Even if none of the values are negative, the standard deviation may be greater than the mean. For example: 4 numbers: 0, 0, 2, 3. The mean is 1.25, the population standard deviation is 1.3 and the sample standard deviation is 1.5.

This is not the same as 'negatively skewed' where the distribution of data about the mean tails off to the left with the majority of points being greater (the median and the mode are greater than the mean).

This question is a trick - and quite a trivial one at that. A negative distribution's mean would

be, of course, negative but the standard deviation would still be a positive number.

Student's t test is a parametric test comparing normally distributed data.



[Q: 3209] OnExamination 2012 - Statistics

Adequate randomisation can be assumed in which of the following circumstances?

- 1- All consecutive patients attending a tertiary referral centre
- 2- A sample based on a family cluster
- 3- A sample of those judged to be appropriate for inclusion in the study
- 4- A sample using healthy volunteers
- 5- A stratified random sample

Answer & Comments

Answer: 5- A stratified random sample

The actual patients included in the study often differ substantially from what was initially intended. This dramatically alters one's interpretation of a study.

The target population includes all those with a given disease, and is seldom fully accessible. The accessible population available for study may be biased in time or place.

It is important to randomise when selecting a sample which is supposed to represent the target population. In simple randomisation, every member of the population is numbered, and a random sample is selected.

In a stratified random sample, groups of interest are identified, and then randomisation occurs within those groups.

In systematic sampling a "periodic" approach is used. This is not really random and is open to alteration and bias.

In a cluster sample, a natural grouping of population is used (such as a family), but this

may well be unrepresentative of the whole population.

Classic errors in randomisation are:

Consecutive sampling, which may well not be representative if the study time is short.

Convenience sampling: strong potential for bias, with volunteers generally healthier than others.

Judgmental sample: including those that you want only. The potential for systematic error is enormous.



[Q: 3210] OnExamination 2012 - Statistics

A clinical trial assessing a new lipid-lowering therapy for stroke allocates 1000 patients to active treatment and another 1000 patients to placebo.

Results demonstrate that number needed to treat (NNT) is 20 for the prevention of the primary end-point.

Which of the following best describes the results?

- 1- 20 patients in the treatment group were protected from stroke.
- 2- 20 extra patients in the placebo group had a stroke
- 3- For 1000 patients treated with active therapy, there would be 20 fewer strokes
- 4- For 1000 patients treated with active therapy, there would be 50 fewer strokes.
- 5- For every 1000 patients treated with active therapy there would be 100 fewer strokes

Answer & Comments

Answer: 4- For 1000 patients treated with active therapy, there would be 50 fewer strokes.

This prevention study for stroke reveals that 20 patients need to be treated to prevent one event.

Thus if you treat a 1000 patients then you will expect to have 50 fewer strokes.

Confidence Intervals for the Number Needed to Treat



[Q: 3211] OnExamination 2012 - Statistics

A new rapid test is developed for the screening of malaria.

Blood from 200 patients was analysed by the gold standard laboratory technique and by the new method. There were 100 positive results with the gold standard technique but there were only 50 positive results using the new technique.

Approximately which of the following values reflects the negative predictive value of the new technique?

- 1- 33%
- 2- 50%
- 3- 66%
- 4- 90%
- 5- It cannot be determined

Answer & Comments

Answer: 5- It cannot be determined

The negative predictive value is the number of true negatives / (number of true negatives + false negatives). It reflects the proportion of patients with negative test results who are correctly diagnosed.

100 patients do not have disease by the gold standard. But we don't know how many of these were tested negative using the new technique among the 150 who tested negative. Therefore, we don't know the number of true negatives and false negatives



[Q: 3212] OnExamination 2012 - Statistics

A new rapid test is developed for the

screening of leptospirosis.

Blood from 100 patients was analysed by the gold standard laboratory technique and by the new method. There were 20 positive results with the gold standard technique but there were 40 positive results using the new technique. The new technique correctly identified all cases that were later confirmed with the gold standard technique.

Approximately which of the following values reflects the positive predictive value of the new technique?

- 1- 33%
- 2- 50%
- 3- 66%
- 4- 75%
- 5- 90%

Answer & Comments

Answer: 2- 50%

The positive predictive value is number of true positives / (number of true positives + false positives).

In the new technique there were 20 true positives and 20 false positives.

Thus the positive predictive value is $20 / (20 + 20) = 50\%$.



[Q: 3213] OnExamination 2012 - Statistics

In a double blind controlled trial assessing the impact of a new antihypertensive in the treatment of stroke versus conventional antihypertensive therapy in the secondary prevention of stroke, the authors report an absolute annual risk reduction in the incidence of stroke of 0.5% and a relative risk reduction of 20% ($p = 0.032$).

The cost of the new treatment is £100 more expensive per year than conventional therapy.

What would be the cost of implementing the new therapy for each stroke prevented?

- 1- £2000
- 2- £4000
- 3- £10,000
- 4- £20,000
- 5- £50,000

Answer & Comments

Answer: 4- £20,000

In this case, the annual incidence of stroke is reduced by 0.5% and treatment is £100 more than conventional therapy.

The relative risk reduction of 20% means that the annual risk of stroke is 2.5% (0.5% is 1/5 of 2.5%) in the conventionally treated group.

Thus for every 200 patients treated one less stroke would occur with the new drug versus the conventional therapy.

Number needed to treat (NNT) is therefore 200 per year to prevent one stroke.

Thus the annual cost of this treatment associated with preventing one stroke, despite its significant reduction in stroke reduction ($p = 0.032$) would be:

$200 \text{ patients} \times £100 = £20,000.$



[Q: 3214] OnExamination 2012 - Statistics

A study was performed to assess the usefulness of a new autoantibody test for the detection of suspected Hashimoto's disease.

The test was undertaken in 1000 subjects who complained of tiredness and all test results were compared with FNA biopsy results which provided a gold standard for the diagnosis of Hashimoto's disease.

The following table lists the results:

	Antibody +ve	Antibody -ve	Total
Hashimoto's disease confirmed at FNA	35	15	50
No evidence of disease at FNA	30	920	950

Approximately, what is the sensitivity of the antibody test for the detection of Hashimoto's disease?

- 1- 50%
- 2- 60%
- 3- 70%
- 4- 80%
- 5- 90%

Answer & Comments

Answer: 3- 70%

The sensitivity of a test is the ability of a test to identify those with the condition.

In this example, 50 individuals had Hashimoto's disease according to the gold standard test of biopsy, with 35 of these being identified by the antibody test.

$35/50 \times 100 = 70\%.$



[Q: 3215] OnExamination 2012 - Statistics

In a primary prevention study of stroke comparing a new antihypertensive with conventional antihypertensive therapy, the number of patients who had a stroke over the study period was 200 in group 1 with the new therapy ($n = 5200$) versus 250 with conventional therapy ($n = 4750$).

Which of the following is the approximate odds ratio for the new therapy?

- 1- 0.25
- 2- 0.5

3- 0.75

4- 1

5- 1.5

Answer & Comments

Answer: 3- 0.75

An odds ratio is calculated by dividing the odds in the treated or exposed group by the odds in the control group. Studies generally try to identify factors that cause harm - those with odds ratios greater than one.

The new therapy odds of an event is 200/5000 (patients without an event 5200-200) = 0.04.

Group 2's odds event rate is 250/4500 (4750-250) = 0.055. The odds ratio is therefore:

$$0.04/0.055 = 0.73$$

This odds ratio is less than 1, indicating an overall benefit of therapy.

For calculations on odds ratio see this article.



[Q: 3216] OnExamination 2012 - Statistics

A clinical investigation examined the effectiveness of a new test for diagnosing pancreatic carcinoma.

The sensitivity was reported as 70%.

Which one of the following statements is correct?

- 1- 70% of people will be correctly classified as having or not having the disease
- 2- 70% of people with a normal test result will not have the disease
- 3- 70% of people with an abnormal test result will have the disease
- 4- 70% of people with the disease will have a normal test result
- 5- 70% of people with the disease will have an abnormal test result

Answer & Comments

Answer: 5- 70% of people with the disease will have an abnormal test result

Sensitivity is the conditional probability that the test will be positive if the condition is present.

Specificity is the conditional probability that the test will be negative if the condition is absent.

Therefore interpreting the data there is a 70% probability of the test being positive when tested in a group of patients with the disease.



[Q: 3217] OnExamination 2012 - Statistics

A randomised double-blind placebo controlled study of a cholesterol-lowering drug for the primary prevention of coronary heart disease was conducted. It had a five-year follow up period.

The results showed an absolute risk of myocardial infarction (MI), in the group receiving placebo, was 10 per cent. The relative risk reduction of those given the cholesterol lowering medication was 0.8.

Approximately what number of patients will need to be treated with the drug for five years to prevent one myocardial infarction?

- 1- 10
- 2- 12.5
- 3- 15
- 4- 20
- 5- 25

Answer & Comments

Answer: 2- 12.5

This is a question concerning number needed to treat (NNT). The calculation involves a little arithmetic.

The absolute risk of MI in the group is a pretty high 10%, that is, of 1000 patients on placebo 100 will have MI over five years.

The relative risk reduction is stated as 0.8, that is, 80%.

Therefore, if you treat 1000 patients for five years with the cholesterol lowering agent you will get only 20 MIs.

Thus, for 1000 patients treated you will get 80 fewer MIs.

Thus number needed to treat to get one fewer MI is $1000/80 = 12.5$.

Or, if you are any good at remembering formulae you can remember the following:

1. Relative risk reduction (RRR) = Absolute risk reduction (ARR) / Control event rate (CER)
2. Numbers needed to treat (NNT) = $1 / \text{Absolute risk reduction (ARR)}$

You can then just insert the figures into these formulae.

The control (or placebo) event rate (CER) is 10% or 0.10. The relative risk reduction is 0.80.

Inserting these figures into the above formulae.... $RRR = ARR / CER$ $0.80 = ARR / 0.10$
 $ARR = 0.80 * 0.10 = 0.08$. Then the NNT can be calculated by $NNT = 1 / ARR = 1 / 0.08 = 12.5$.

However, if algebra is not your thing you could try working with real numbers.

Imagine a group of 100 patients (it makes the maths easier). In the control (or placebo group) 10% (or 10 patients) suffered an MI. The relative risk reduction is 0.8 or 80%.

Therefore, in the treatment group, there would be a reduction in events by 80% (of 10 patients) = 8 patients. The number of patients suffering an MI in the treatment would therefore be $10 - 8 = 2$ patients.

It can therefore be said that treating 100 patients with the new drug would result in eight fewer MIs.

The number needed to treat to prevent one MI would be $100/8 = 12.5$ patients.



[Q: 3218] OnExamination 2012 - Statistics

Which of the following statements is true regarding statistical interpretation of data?

- 1- The cumulative incidence rate is usually given over a 10 year period.
- 2- The incidence equals the number of newly affected individuals divided by the number of people at risk for the disease for a given duration.
- 3- The mortality rate is a kind of cumulative prevalence rate.
- 4- The prevalence rate is defined as the total number of cases divided by the total number in the population.
- 5- Prevalence is always higher than incidence.

Answer & Comments

Answer: 2- The incidence equals the number of newly affected individuals divided by the number of people at risk for the disease for a given duration.

The incidence can be thought of as the number of new cases occurring in a given time.

The cumulative incidence rate is usually reported over a year.

Prevalence equals the total number of cases divided by the total number of at risk.

In diseases for which the exact onset cannot be determined such as cancers, it may be difficult to distinguish between incidence and prevalence.

Mortality rate is a special kind of cumulative incidence rate, with deaths in the numerator and population in the denominator.

Case fatality rate has deaths in the numerator and the number of people with a specific disease in the denominator.

Prevalence may be lower than incidence if the condition has high fatality or cure rate.



[Q: 3219] OnExamination 2012 - Statistics

In a trial of a new drug, 13/28 treated improved over a one month period, compared with 3/28 on placebo.

For Chi² testing which of the following is correct?

- 1- A value of Chi² of 4.6 would imply that the result would have been obtained by chance in 46/100 trials.
- 2- The figures should first be converted to percentages.
- 3- The results would almost certainly suggest that more cases were needed to obtain a significant result.
- 4- There is one degree of freedom.
- 5- The results would be invalidated if a disproportionate number of cases treated with the new drug had developed side effects.

Answer & Comments

Answer: 4- There is one degree of freedom.

Chi² testing refers to count data (categorical). It therefore refers to 2 by 2 tables or larger. The test statistic is defined by:

$$\text{Chi}^2 = \frac{E (\text{observed} - \text{expected})^2}{\text{expected}}$$

The degrees of freedom equal (rows -1) x (columns -1). Significance can be looked up using the Chi² distribution according to the appropriate number of degrees of freedom.

Side effects of the new drug will affect interpretation of the conclusion of the trial but not invalidate the results.



[Q: 3220] OnExamination 2012 - Statistics

A letter published in a medical journal suggests that an established antidepressant may cause photosensitivity. The manufacturer wishes to set up a study to determine rapidly and efficiently whether this is a true association.

Which one of the following techniques is most appropriate?

- 1- Case-control study
- 2- Dose ranging study
- 3- Double blind, randomised, placebo controlled study
- 4- Meta-analysis
- 5- Sequential trial

Answer & Comments

Answer: 4- Meta-analysis

The drug is an established one and the correct answer can be found by elimination.

A 'double-blind, randomised, placebo controlled study' would be time consuming, expensive and unlikely to be powered enough to detect what may be a rare toxic effect. Remember the drug is established so there have been many patients taking it already and only lately a letter is published in a medical journal.

A 'dose ranging study' is really for another purpose - to decide the correct dose in early clinical trials so it is hardly going to be of any use here.

A 'sequential' trial would be comparing one therapy to another sequentially (usually with wash out periods in between). Again there are

unlikely to be enough subjects in the trial for this small risk.

A case-control study would look at cases of photosensitivity (perhaps in subjects taking any antidepressant medication) and compare them to age matched (or other criteria matched) control subjects to see if they were more / less / equally likely to be on the antidepressant in question. It would produce a lower level of evidence than a meta-analysis, and would require getting more raw data (which is less rapid and efficient than meta-analysis).

A 'meta-analysis' would look at combining all previous data, hoping there had been some trials that looked at photosensitivity for it to be of any use in this case. This is likely to be the quickest option to complete, and also produces the highest level of evidence.



[Q: 3221] OnExamination 2012 - Statistics

In a study assessing two different antiplatelet agents in the prevention of stroke, 10,000 subjects were randomised to receive either the standard therapy or the new therapy.

Over the study period of five years, the side effect of major gastrointestinal (GI) bleeding was 3% in the standard therapy group compared with 2% in the new therapy group.

Which of the following is the absolute risk reduction associated with the new therapy in major GI bleeds?

- 1- 1%
- 2- 3%
- 3- 10%
- 4- 15%
- 5- 33%

Answer & Comments

Answer: 1- 1%

We are not told whether there is a significant difference between the two groups yet in the standard antiplatelet therapy group there is a risk of GI bleed of 3% vs 2% with the new therapy.

This is a 1% absolute risk reduction and a 33% relative risk reduction (1/3).

The number of people that would need to be treated with the new drug to avert the major effect of bleeding would be 100.



[Q: 3222] OnExamination 2012 - Statistics

A clinical trial is published demonstrating an absolute risk reduction of 2.5% on treatment with a new pharmaceutical agent.

Which of the following statements best describes absolute risk reduction?

- 1- Number of patients who need to be treated to prevent one event
- 2- The odds of an event in the control group divided by the odds of an event in the treatment group
- 3- The risk of an event in the control group minus the risk of an event in the treatment group
- 4- The risk of an event in the treated group divided by the risk of an event in the control group
- 5- The risk reduction divided by the initial risk in the control group

Answer & Comments

Answer: 3- The risk of an event in the control group minus the risk of an event in the treatment group

The number of patients who need to be treated to prevent one event is the number needed to treat (NNT).

The odds of an event in the control group divided by the odds of an event in the treatment group is the odds ratio.

The risk of an event in the treated group divided by the risk of an event in the control group is the relative risk.

The risk reduction divided by the initial risk in the control group is the relative risk reduction.

The absolute risk reduction is the proportion of the risk removed by treatment, and is calculated by the risk of an event in the control group minus the risk of an event in the treatment group. It is usually expressed as a percentage.



[Q: 3223] OnExamination 2012 - Statistics

A researcher compared the mean scores for nausea on a rating scale between standard therapy and a new drug in the treatment of chemotherapy induced nausea.

Which one of the following is the most appropriate statistical test?

- 1- Chi-square test
- 2- Life table analysis (log rank test)
- 3- Paired t test
- 4- Pearson correlation
- 5- Unpaired t test

Answer & Comments

Answer: 5- Unpaired t test

The two sample unpaired t test is used to test the null hypothesis that the two populations corresponding to the two random samples are equal.

For a paired t test, the data are dependent, that is, there is a one-to-one correspondence between the values in the two samples; for example, the same subject measured before and after a process change, or the same subject measured at different times.



[Q: 3224] OnExamination 2012 - Statistics

An experienced group of surgeons report on a randomised placebo-controlled trial comparing a particular carotid surgery technique to a sham operation.

Their study concludes that 'using this advanced surgical technique reduces the risk of stroke from 4.3% to 3.8% ($p < 0.05$)'.

What has this study proved about the surgical procedure?

- 1- Acceptability
- 2- Effectiveness
- 3- Efficacy
- 4- Safety
- 5- Usefulness

Answer & Comments

Answer: 3- Efficacy

This is an experienced group of vascular surgeons working in ideal conditions. Similar studies have been reported for carotid surgery but it has been difficult to prove their usefulness outside areas of expertise.

It is often difficult to generalise the findings in a study group to everyday practice.

Efficacy = the effect of something under ideal or laboratory conditions.

Effectiveness = the effect of something in the real world.



[Q: 3225] OnExamination 2012 - Statistics

In a chronic disease which has no known effective treatment, a new treatment is known to be effective in animal models and shows promise in short term studies in patients.

There are some theoretical concerns about toxicity involving liver and bone marrow

although no cases have been observed in studies so far.

What is the most appropriate next step in the drug's development?

- 1- Case-control study
- 2- No further studies should be done and drug development should be stopped
- 3- Open study
- 4- Randomised double blind placebo controlled study
- 5- Randomised single blind placebo controlled study

Answer & Comments

Answer: 4- Randomised double blind placebo controlled study

The story that is described is of an early drug development that has gone through phase I trials (normal volunteers) and phase II studies (more normal volunteers but it also mentions 'studies in patients').

The next step in the development of this drug is a phase III study - where the drug's efficacy and safety should be tested against a placebo.

Broadly, the development of a new drug can be divided into pre-clinical and clinical trials.

Pre-clinical development first involves identifying the target thought to be important in disease. Drug candidates are then identified, and their properties optimised. Pre-clinical safety studies are then conducted to determine dosage, ensure safety and study pharmacokinetic properties. These involve both computer and animal models. All information gathered from pre-clinical testing is submitted to the regulatory authorities, prior to moving to the clinical phase of drug development.

Clinical trials have a number of phases:

In phase I the drug is usually given to healthy volunteers to determine its safety and pharmacokinetic properties in humans.

In phase II a small group of patients (typically 100-250) are given the drug to evaluate its efficacy, optimum dose, safety and side effects (as these may be different in patients compared to healthy volunteers). If these trials are successful larger clinical trials can be planned.

Phase III trials typically involve more than 1000 patients, and are used to determine efficacy and side effects. If successful the drug must be registered by the authorities prior to being released to the market.

It is important to note the majority of drugs identified in early pre-clinical trials will never make it to market, as they are not shown to have a significant effect or they are associated with significant toxicity.

Post-marketing studies then continue to determine the long term and chronic toxicities. UK practitioners are requested to report any side effects via the yellow card scheme.



[Q: 3226] OnExamination 2012 - Statistics

A study is designed to test the accuracy of faecal occult blood (FOB) testing in excluding a certain type of bowel cancer. Faecal occult bloods are compared to a gold standard which consists of a battery of tests and pathological diagnoses. In the study 200 prospective patients undergo faecal occult blood testing and are followed up with the gold standard investigations.

The gold standard results test demonstrated that malignancy was present in 100 of the 200 patients tested. Of these 100 patients with proven malignancy, faecal occult blood testing was positive in 90 patients. Of those testing negative, FOBs were negative in 80 patients.

Approximately which of the following values reflects the negative predictive value of the faecal occult blood testing in this study?

- 1- 33%
- 2- 50%
- 3- 66%
- 4- 75%
- 5- 89%

Answer & Comments

Answer: 5- 89%

The negative predictive value is the number of true negatives/(number of true negatives + false negatives). It reflects the proportion of patients with negative test results who are correctly diagnosed.

In the new technique there were 100 true positives who had the disease (that is, 100 true negatives) and 10 false negatives (where the faecal occult blood test missed the diagnosis).

Thus the negative predictive value is $80/(80+10) = 88.9\%$.



[Q: 3227] OnExamination 2012 - Rheumatology

A 30-year-old man with longstanding psoriasis has a six week history of persistently swollen, painful, and tender right knee. The early morning stiffness lasts for over an hour, and he has partial relief from the use of NSAIDs.

He is negative for rheumatoid factor. A knee x ray is normal.

What is the next step in his long term management?

- 1- Alternative NSAID
- 2- Anti-TNF α agents
- 3- Disease modifying antirheumatic drugs (DMARDs)
- 4- Intra-articular corticosteroids
- 5- Oral corticosteroids

Answer & Comments

Answer: 3- Disease modifying antirheumatic drugs (DMARDs)

This patient has psoriatic arthritis and should be treated with a DMARD to prevent joint damage from proliferative/ erosive changes in psoriatic arthritis.

In the United Kingdom, anti-TNF agents are used for the treatment of psoriatic arthritis only if the patient fails to respond to an adequate trial of two DMARDs (for example, leflunomide, methotrexate, sulfasalazine). Hydroxychloroquine has been shown to exacerbate psoriatic skin lesions in certain situations, and is therefore used with caution if at all.

Nonsteroidal anti-inflammatory drugs (NSAIDs) provide partial symptom relief and do not prevent progressive joint damage.

In patients with cutaneous psoriasis, systemic corticosteroids predispose to pustular psoriasis, and may result in a flare of skin psoriasis when they are stopped.

Intra-articular corticosteroid injections may be considered for symptom control during a mono- or oligo-articular flare of psoriatic arthritis. This is a useful adjunct to therapy but is not appropriate long term management in itself.



[Q: 3228] OnExamination 2012 - Rheumatology

A 70-year-old man developed acute monoarthritis of his right ankle on the second postoperative day following an elective inguinal hernia repair. He was on a diuretic for hypertension.

On examination his temperature was 38°C.

What is the most likely diagnosis?

- 1- Acute rheumatoid arthritis
- 2- Gout
- 3- Pseudogout
- 4- Septic arthritis
- 5- Traumatic synovitis

Answer & Comments

Answer: 2- Gout

The most likely diagnosis is gout, given the history of recent surgery and diuretic use.

Gout is the most prevalent form of inflammatory arthropathy. It is caused by the deposition of monosodium urate crystals with resultant inflammation in the involved joint. It typically presents with acute monoarticular pain. Current EULAR guidelines state that the rapid development of severe pain, swelling, and tenderness that reaches its maximum within 6-12 hours, especially with overlying erythema, is highly suggestive of crystal arthropathy. Involvement of the first metatarsophalangeal joint is more specific for gout, but a variety of different joints can be involved. 50% of all attacks and 70% of first attacks of gout affect the first metatarsophalangeal joint.

In addition to joint symptoms, fever and malaise are common presenting features of an acute attack of gout. Acute gout can be a cause of systemic inflammatory response syndrome (SIRS) which is two or more changes of body temperature, heart rate, respiratory function, and peripheral leukocyte count.

There is a florid synovitis, with swelling and overlying erythema. Palpation is exquisitely painful. Untreated, the attack resolves spontaneously over 5-15 days with itching and desquamation of the overlying skin.

The EULAR guidelines conclude that for typical presentations of gout a clinical diagnosis alone is reasonably accurate but not definitive without visualisation of crystals on microscopy.

Pyrophosphate arthropathy is less common, associated with deposition of calcium pyrophosphate crystals chiefly in the knees, second and third metacarpophalangeal joints. There may be a history of haemochromatosis or osteoarthritis.

Rheumatoid arthritis most commonly manifests as a chronic polyarthritis and synovitis.

Septicaemia following an elective hernia repair would be uncommon as would traumatic synovitis. Examination of joint aspirate is always important however, to exclude septic arthritis as missing this diagnosis is associated with significant morbidity and mortality.

Although not needed to answer this question, it is important you also understand how to manage an acute episode of gout. The principles are:

- commence anti-inflammatory medication immediately, and continue for two weeks - NSAIDs are first line in conjunction with gastro-protective medication where indicated; colchicine is an alternative but is

slower to work and can be associated with significant diarrhoea

- rest the affected joints
- allopurinol should not be started during an acute attack but in patients already established on allopurinol it should be continued
- if diuretics are being used to treat hypertension an alternative antihypertensive should be considered, but they should not be stopped in the presence of heart failure
- corticosteroids are highly effective, and can be used where NSAIDs are not tolerated, or in refractory disease (intra-articular, oral, intramuscular, intravenous)

Reference:

EULAR evidence based recommendations for gout. Part 1: Diagnosis. Report of a task force of the Standing Committee for International Clinical Studies Including Therapeutics (ESCISIT). Zhang W et al. Ann Rheum Dis. 2006 Oct;65(10):1301-1311

British Society for Rheumatology and British Health Professionals in Rheumatology Guideline for the Management of Gout. Jordan KM et al. Rheumatology 2007;46:1372-1374.



[Q: 3229] OnExamination 2012 - Rheumatology

A 65-year-old male is referred due to inadequate pain relief for his hip osteoarthritis.

His GP has prescribed paracetamol and codeine 30 mg four times daily but he has found little improvement in his pain relief.

He has a past history of asthma for which he occasionally takes an inhaler.

What is the most likely explanation for the lack of clinical efficacy associated with this medication?

- 1- Fast acetylase status
- 2- Impaired absorption of codeine
- 3- Inadequate dose of codeine

- 4- Interaction of paracetamol with codeine
 5- Ipratropium accelerates the metabolism of codeine

Answer & Comments

Answer: 3- Inadequate dose of codeine

The most likely explanation is that the codeine dose is inadequate.

Studies have shown that paracetamol 1 g combined with codeine at dose of 60 mg have the best analgesic outcomes.

Ipratropium does not increase the metabolism of codeine.



[Q: 3230] OnExamination 2012 - Rheumatology

A 79-year-old woman presents with mild dyspnoea and confusion. Of note in her past medical history is a one year history of Raynaud's phenomenon.

On examination her pulse is 118 beats per minute, she has a blood pressure of 122/88 mmHg and she has a small ulcer on her right big toe.

Auscultation of her chest reveals bibasal crackles and she has mild ankle oedema.

Her investigations show:

Haemoglobin 9.5 g/dl (11.5-16.5)

White cell count $3.5 \times 10^9/L$ (4-11)

Platelet count $110 \times 10^9/L$ (150-400)

Serum total protein 120 g/l (61-76)

Serum immunoglobulins:

IgA 0.8 g/l (0.8-3.0)

IgG 15 g/l (6.0-13.0)

IgM 70 g/l (0.4-2.5)

Which of the following complications is she likely to develop?

- 1- Acute renal failure
 2- Atypical pneumonia

- 3- Erythema repens gyratum
 4- Hyperviscosity syndrome
 5- Pathological bone fracture

Answer & Comments

Answer: 4- Hyperviscosity syndrome

This elderly woman has a very raised IgM level, pancytopenia, Raynaud's phenomenon and a foot ulcer.

The most likely diagnosis here is Waldenström's macroglobulinaemia (WM). WM refers to a condition that presents in the seventh or eighth decade of life.

It is characterised by the presence of a high level of a macroglobulin (immunoglobulin M [IgM]), elevated serum viscosity and the presence of a lymphoplasmacytic infiltrate in the bone marrow, resulting in pancytopenias.

Raynaud's phenomenon may herald the onset of this condition and is due to cryoglobulinaemia.

The monoclonal IgM causes:

- Hyperviscosity syndrome
- Cryoglobulinaemia types 1 and 2
- Coagulation abnormalities
- Polyneuropathies
- Cold agglutinin disease and anaemia
- Primary amyloidosis

Tissue deposition of amorphous IgM in skin, the gastrointestinal tract, kidneys, and other organs.

The other conditions described here are not commonly associated with WM, and are more often seen in combination with myeloma. Erythema repens gyratum is a skin rash thought to be a paraneoplastic process.



[Q: 3231] OnExamination 2012 - Rheumatology

A 45-year-old male attends for an insurance

medical and is in good health.

Examination was normal but investigations reveal that he has a serum urate concentration of 0.55 mmol/L (0.25-0.45).

Which of the following is the most appropriate management for this patient?

- 1- Lifestyle advice
- 2- Start allopurinol
- 3- Start colchicine
- 4- Start diclofenac
- 5- Start prednisolone

Answer & Comments

Answer: 1- Lifestyle advice

The most appropriate treatment for this asymptomatic man with an isolated slightly elevated urate is lifestyle advice with an appropriately reduced purine diet, increased exercise and reduced alcohol consumption.



[Q: 3232] OnExamination 2012 - Rheumatology

A 42-year-old female with a recent diagnosis of systemic sclerosis, is referred to hospital with a complaint of headaches and blurred vision. She has a medical history of asthma.

On examination, her blood pressure is 230/120 mmHg and there is bilateral papilloedema.

Which of the following medications should be prescribed immediately?

- 1- IV furosemide
- 2- IV labetalol
- 3- IV sodium nitroprusside
- 4- Oral enalapril
- 5- Sublingual nimodipine

Answer & Comments

Answer: 4- Oral enalapril

Systemic sclerosis is a systemic disorder characterised by skin thickening due to the deposition of collagen in the dermis. Adverse prognostic features are renal, cardiac or pulmonary involvement.

A major complication is the development of scleroderma renal crisis. This is characterised by the abrupt onset of severe hypertension, usually with retinopathy, together with rapid deterioration of renal function and heart failure.

In addition patients may present with headaches, fever and malaise. It develops in 5-10% of patients with diffuse systemic sclerosis especially associated with diffuse cutaneous or rapidly progressive forms of systemic sclerosis, and patients in whom a high dose of corticosteroid has been started.

Renal crisis is linked with a positive ANA speckled pattern, anti-RNA polymerase I and II antibodies and absence of anti-centromere antibodies¹.

It usually presents early, within four years of diagnosis. The pathogenic mechanisms leading to renal damage are not completely understood but they involve endothelial cell damage and intimal thickening of the renal arteries, resulting in hyperplasia of the juxtaglomerular apparatus and increased renin release¹. Renal biopsy is not necessary in patients presenting with classical features of renal crisis².

The clinical presentation is typically with the symptoms of malignant hypertension:

Headaches

Hypertensive retinopathy associated with visual disturbances

Seizures

Heart failure and pulmonary oedema.

Renal function is impaired and usually rapidly deteriorates. The hypertension is almost always severe with a diastolic BP over 100

mmHg in 90% of patients. There is hypertensive retinopathy in about 85% of patients with exudates and haemorrhages and if severe, papilloedema. There may also be microangiopathic haemolytic anaemia, thrombocytopenia and raised renin levels.

Scleroderma renal crisis is a medical emergency. Aggressive treatment is required to prevent the occurrence of irreversible vascular injury. First line treatment is a gradual reduction in blood pressure (10-15 mmHg per day) with an ACE inhibitor until the diastolic pressure reaches 85-90 mmHg. This approach leads to a response in 90% of patients by reversing the angiotensin-II mediated vasoconstriction.

An abrupt fall in blood pressure should be avoided as it can further diminish renal perfusion and increase the risk of acute tubular necrosis. Therefore, parenteral antihypertensive agents (for example, intravenous nitroprusside or labetalol) should be avoided.

Calcium channel blockers, usually nifedipine, may be added where there is inadequate reduction of blood pressure with ACE inhibitors alone. Additional oral hypotensive agents (for example, labetalol) can be used if required, and if pulmonary oedema is present a nitrate infusion may be indicated. There is anecdotal evidence that intravenous prostacyclin helps the microvascular lesion without precipitating hypotension, and this is used in some UK centres.

Deterioration in renal function can be rapid, with gross pulmonary oedema; therefore patients with scleroderma renal crisis should be managed in hospitals with facilities for dialysis.

Early aggressive treatment with ACE inhibitors has improved prognosis in renal crisis, although 40% of patients will require dialysis and mortality at five years is 30-40%. Median time to recovery is one year, and

typically occurs within three years¹. Prognosis is worse for males¹. Patients who need dialysis for more than two years can be considered for renal transplantation². The recurrence rate has been estimated to be approximately 20%.

Care should be taken not to confuse scleroderma renal crisis with malignant hypertension. Malignant hypertension is a clinical syndrome characterised by marked elevation of blood pressure, with widespread acute arteriolar injury⁴. It has a number of different causes and treatment differs depending on the underlying condition. The pathogenesis overlaps, but idiopathic malignant hypertension tends to involve the smaller vessels than in scleroderma renal crisis⁵.



[Q: 3233] OnExamination 2012 - Rheumatology

A 62-year-old female presents with deteriorating arthralgia associated with longstanding rheumatoid arthritis. She was prescribed celecoxib in place of naproxen.

Which of the following concerning celecoxib is correct?

- 1- Anti-inflammatory effects of celecoxib are superior to those of naproxen
- 2- Celecoxib acts by inhibiting a different enzyme than naproxen
- 3- Celecoxib has a lower level of anti-platelet activity than naproxen
- 4- Celecoxib is associated with reduced hepatotoxicity compared with naproxen
- 5- Co-treatment with diuretic can be given more safely than with naproxen

Answer & Comments

Answer: 3- Celecoxib has a lower level of anti-platelet activity than naproxen

Celecoxib is a selective cyclo-oxygenase (COX)-2 inhibitor differing from the other non-

steroidal anti-inflammatory drugs (NSAIDs) such as naproxen which affects both COX-1 and COX-2.

COX-1 is involved in platelet aggregation and inhibition of this by the NSAIDs produces its beneficial cardiovascular effects. However platelet aggregation is not affected by COX-2.

Naproxen and celecoxib have been shown to be as effective at reducing inflammation. One of the benefits of celecoxib is its reduced incidence of upper gastrointestinal side effects.

As with the non-specific NSAIDs, hepatotoxicity may occur with the COX-2 specific inhibitors resulting in cholestatic, hepatocellular or mixed liver injury. Rates seem to be comparable between the traditional NSAIDs and the COX-2 selective inhibitors.

Co-administration of diuretics and COX-2 inhibitors should be avoided if possible, as COX-2 inhibitors may reduce the antihypertensive and diuretic effects of diuretics. This may be due to impaired prostaglandin synthesis, which results in salt and water retention. In addition, COX-2 inhibitors have nephrotoxic effects which can be exacerbated by diuretics.

Rofecoxib (Vioxx) has been withdrawn due to its increased cardiovascular events compared with naproxen. The cardiovascular effects of the COX-2 inhibitors remains under study, and care should be taken before prescribing them to patients with a past medical history of significant cardiovascular disease.



[Q: 3234] OnExamination 2012 - Rheumatology

A 78-year-old man presents with an acute onset of severe pain and swelling of the left wrist which had developed since he had a chest infection two weeks previously.

On examination he had a temperature of 38°C and the left wrist was red, swollen and painful.

What is the most appropriate investigation for this patient?

- 1- Erythrocyte sedimentation rate
- 2- Full blood count
- 3- Joint aspiration
- 4- Serum urate concentration
- 5- x Ray of the joint

Answer & Comments

Answer: 3- Joint aspiration

This gentleman has presented with an acute onset monoarthritis.

A destructive septic arthritis is a potential diagnosis, and must be excluded as a matter of urgency. An aspirate is the most crucial step to exclude this and allow the timely commencement of appropriate antibiotics. Differential diagnoses include gout and pseudogout, which can also be diagnosed on joint aspiration.

ESR will be raised in many causes of joint inflammation or infection, and is therefore not helpful in establishing a diagnosis in the acute situation. It can be used to guide treatment in inflammatory arthropathies after a diagnosis is made.

Full blood count is also non-specific and often does not assist in making a diagnosis.

Hyperuricaemia is a pre-requisite for gout, but normal serum urate levels at presentation does not exclude an acute gouty attack. It is therefore not the most appropriate investigation in this case.

In the acute stages of septic arthritis there may be no signs of damage to the joint seen on a radiograph. It may show typical changes of calcium pyrophosphate dehydrate deposition or gout, which may help in his long

term management, but would not change management in the acute situation.



[Q: 3235] OnExamination 2012 - Rheumatology

A young woman has acne and is taking oral medication. She develops polyarthrititis and has raised liver enzyme tests.

Investigations show:

AST 95 U/l (1-31)

ALT 170 U/l (5-35)

Bilirubin 16 µmol/l (1-22)

Antinuclear antibodies Strongly positive at 1/20

Negative at 1/640

Which of the following drugs is she most likely to have been prescribed?

- 1- Erythromycin
- 2- Isotretinoin
- 3- Minocycline
- 4- Oxytetracycline
- 5- Trimethoprim

Answer & Comments

Answer: 3- Minocycline

Except trimethoprim, all other drugs listed above are used in the treatment of acne. All of these can cause hepatotoxicity, and therefore raised alanine aminotransferase (ALT) and aspartate aminotransferase (AST).

Minocycline is the only drug listed which can account for the polyarthrititis and antinuclear antibody (ANA), due to its ability to cause drug-induced lupus erythematosus.

Classically, drug-induced lupus erythematosus is characterised by

Systemic disease with a lower incidence of nephritis

Lack of cutaneous involvement and

The presence of antihistone antibodies¹.

The most commonly associated drugs have historically been procainamide and hydralazine ², although their use is now decreasing. Medications associated more recently include the anti-TNF alpha agents, statins and minocycline.

Minocycline is unusual in that it seems to be associated with the development of long term immunological memory, and therefore exacerbation of symptoms within 12-24 hours of rechallenge².

Minocycline has been well documented as a cause of drug-induced systemic lupus erythematosus (SLE). Characteristically, the erythrocyte sedimentation rate (ESR) and C reactive protein (CRP) are both markedly elevated, the ANA is strongly positive and there is a hypergammaglobulinaemia.

Anti-dsDNA antibodies are usually negative; antihistone antibodies are positive in 95% of drug-induced lupus (but also 50-80% of idiopathic SLE³).

A strongly positive ANA is a risk factor for developing drug-induced lupus, but a negative ANA would not exclude the diagnosis².

Drug-induced lupus is defined as a lupus-like syndrome temporally related to continuous drug exposure which resolves after discontinuation of the offending drug⁴.

There are several features which distinguish drug-induced lupus from idiopathic SLE:

Males and females are equally affected in drug-induced lupus, whereas idiopathic SLE affects females nine times more frequently³.

Caucasians are affected by drug-induced lupus more commonly than Afro-Caribbeans, whereas the inverse is true of idiopathic SLE.

In addition, the age of onset is typically older in drug-induced lupus, but this depends on the age at drug exposure.

Fever, arthralgia, serositis and ANA occur at least as frequently in drug-induced lupus as idiopathic SLE.

Haematological, renal and central nervous system (CNS) involvement, and double-stranded DNA autoantibodies are rare³.

The pathogenesis of drug-induced lupus is unclear. Factors that influence drug metabolism, such as acetylator status, have been implicated. In addition, lupus-inducing drugs have been shown to generate a variety of cytotoxic products on exposure to MPO released from activated neutrophils².

The time taken for symptoms to resolve after stopping minocycline is highly variable, from a few days to two years³. Typically, no further treatment is required but there are situations where corticosteroids or disease modifying antirheumatic drugs (DMARDs) are required to aid resolution³.



[Q: 3236] OnExamination 2012 - Rheumatology

A 74-year-old man has had increasingly severe, throbbing headaches for several weeks, centered on the right.

There is a palpable tender cord-like area over his right temple. His heart rate is regular with no murmurs, gallops, or rubs. Pulses are equal and full in all extremities, BP is 110/85 mmHg.

A biopsy of this lesion is obtained, and histologic examination reveals a muscular artery with luminal narrowing and medial inflammation with lymphocytes, macrophages, and occasional giant cells.

He improves with a course of high-dose corticosteroid therapy.

Which of the following laboratory test findings is most likely to be present with this disease?

1- Anti-double stranded DNA titre of 1:1024

2- Erythrocyte sedimentation rate of 110 mm/hr

3- HDL cholesterol of 0.6 mmol/L

4- pANCA titre of 1:160

5- Rheumatoid factor titre of 80 IU/mL

Answer & Comments

Answer: 2- Erythrocyte sedimentation rate of 110 mm/hr

The features described here are classical for giant cell arteritis (GCA).

GCA affects large and medium sized arteries, with a predilection for the external carotid, ciliary and retinal arteries.

Endovascular damage and cytokine-mediated inflammation causes local ischaemia. There is considerable overlap with polymyalgia rheumatica, and symptoms of both should be sought. Twenty per cent of patients develop loss of vision, which can be prevented with timely recognition and treatment.

The classically described jaw claudication occurs in a minority of cases, but does indicate a high risk of ischaemic complications.

The typical presentation of GCA is a temporal headache, with myalgia, malaise and fever. Erythrocyte sedimentation rate (ESR) and C reactive protein (CRP) are usually raised.

Once the diagnosis is suspected, high dose corticosteroids should be given. If visual symptoms are present, intravenous methylprednisolone should be given. Once symptoms and laboratory abnormalities resolve, the dose of corticosteroid can be reduced and usually stopped within two years.

Anti-double stranded DNA antibodies are associated with systemic lupus erythematosus.

Reduced high-density lipoprotein (HDL) contributes to increased cardiovascular risk, and can be caused by a number of inherited metabolic conditions or may be secondary to other factors such as smoking. It is not commonly associated with rheumatological disease.

Perinuclear antineutrophil cytoplasmic antibody (pANCA) is associated with microscopic polyangiitis and Churg-Strauss syndrome, neither of which present as described above.

Rheumatoid factor is non-specific, and may be seen in patients with GCA but this is less likely than a raised ESR.



[Q: 3237] OnExamination 2012 - Rheumatology

A 75-year-old man has persistent back pain for several months that is unrelated to physical activity. He has lost 12 kg in weight during this time.

Laboratory findings include a white cell count of $6.7 \times 10^9/L$ with a differential of 5.4 neutrophils, 1.2 lymphocytes and 0.2 monocytes. Haemoglobin is 11.2 g/dl, haematocrit 33.3%, MCV 88 fl, and platelet count $89 \times 10^9/L$.

The biochemistry shows a sodium concentration of 144 mmol/l, potassium 4.5 mmol/l, chloride 100 mmol/l, bicarbonate 26 mmol/l, urea 14 mmol/l, creatinine 90 $\mu\text{mol/l}$, and a glucose of 5.4 mmol/l.

A CT scan of the spine reveals scattered 0.4 to 1.2 cm bright lesions in the vertebral bodies.

Which of the following additional laboratory test findings is he most likely to have?

- 1- Blood culture positive for *Neisseria gonorrhoeae*
- 2- Parathyroid hormone, intact, of 100 pg/ml (normal <65)
- 3- Positive serology for *Borrelia burgdorferi*
- 4- Serum calcium of 1.4 mmol/l

- 5- Serum prostate specific antigen of 35 microgram/l

Answer & Comments

Answer: 5- Serum prostate specific antigen of 35 microgram/l

The combination of back pain, weight loss and osteosclerotic lesions makes prostatic adenocarcinoma the most likely diagnosis in this case.

Several malignancies, including those originating in the prostate, exhibit a propensity to metastasise to the bone. The sequelae include severe pain, pathological fractures, hypercalcaemia and spinal cord compression. Osteoclast-mediated bone degradation and subsequent bone loss are the hallmarks of secondary bone metastases from most solid tumours. In prostate carcinoma, the majority of lesions are osteosclerotic due to inappropriate bone production.

The mainstay of treatment of metastatic bone disease is usually with intravenous bisphosphonates, which reduces bone pain in addition to treating hypercalcaemia. Current evidence indicates that the nitrogen-containing bisphosphonates, especially zoledronic acid, are potent inhibitors of bone resorption. Radiotherapy can also be used to reduce symptoms from localised bone lesions, and taxane-based chemotherapy can be effective for widespread disease. Increased understanding of the pathogenesis of bone metastases has resulted in the development of targeted therapies including RANKL inhibitors, and inhibitors of SRC and cABL kinases.

Gonorrhoea, caused by *Neisseria gonorrhoeae* is the second most common sexually transmitted infection in the UK. It typically affects a younger age group than described here, and septicaemia is uncommon. Whilst it can be associated with

septic and reactive arthritis, these CT findings are not typical.

Hyperparathyroidism is a disease of increased bone resorption and bone formation. Radiographic findings differ in primary and secondary hyperparathyroidism, but neither would explain the weight loss and the pain is typically more generalised.

Borrelia burgdorferi causes Lyme disease, which classically presents with fever and erythema migrans following a tick bite in an endemic area (e.g. the New Forest). Without treatment, it can progress to disseminated disease with a polyarticular arthritis but isolated persistent back pain is not typical.

Hypocalcaemia can be seen in patients with bone metastases, but this is rare and at levels this low you would expect symptoms of neuromuscular irritability (e.g. paraesthesia and carpopedal spasm).



[Q: 3238] OnExamination 2012 - Rheumatology

A 68-year-old woman presents with pain at the base of her right thumb. There is tenderness and swelling of the right first carpometacarpal joint.

What is the most likely diagnosis?

- 1- Avascular necrosis of the scaphoid
- 2- De Quervain's tenosynovitis
- 3- Osteoarthritis
- 4- Psoriatic arthritis
- 5- Rheumatoid

Answer & Comments

Answer: 3- Osteoarthritis

The first carpometacarpal joint is a frequent site of osteoarthritis in postmenopausal women. Clinical features include tenderness, stiffness, crepitus, swelling and pain on abduction of the thumb. Squaring of the

hand, caused by swelling, radial subluxation of the metacarpal and atrophy of the thenar muscles, is a characteristic clinical sign.

Scaphoid fractures are relatively common, typically occurring following a fall onto outstretched hand. The proximal portion lacks its own blood supply, so avascular necrosis can occur if a fracture leaves it isolated from the remainder of the scaphoid. This produces pain and tenderness of the radial side of the wrist, classically in the anatomical snuffbox rather than the base of the thumb, exacerbated by wrist movement.

De Quervain's tenosynovitis disease is a common pathology which consists of a stenosing tenosynovitis of the first dorsal compartment of the wrist. It typically presents with pain on the radial aspect of the wrist, with associated swelling and tenderness. Treatment is with splinting, with or without corticosteroid injection.

The first carpometacarpal joint can be affected in rheumatoid arthritis and psoriatic arthritis but rarely in isolation.



[Q: 3239] OnExamination 2012 - Rheumatology

A 41-year-old African man has a history of multiple episodes of sudden onset of severe abdominal pain and back pain lasting for hours. Each time this happens, his peripheral blood smear demonstrates numerous sickled erythrocytes.

A haemoglobin electrophoresis shows 94% Hgb S, 5% Hgb F, and 1% Hgb A2.

He now has increasing pain in his right groin radiating to the anterior aspect of the thigh and to the knee. His temperature was 38°C and examination of his hip revealed pain on internal rotation. A radiograph reveals irregular bony destruction of the femoral head.

What is the organism most likely to be responsible for these findings?

- 1- Candida albicans
- 2- Clostridium perfringens
- 3- Group B Streptococcus
- 4- Salmonella species
- 5- Yersinia pestis

Answer & Comments

Answer: 4- Salmonella species

Salmonella osteomyelitis is seen in patients with sickle cell anaemia.

Other organisms that are frequent causes for osteomyelitis with sickle cell anaemia include Staphylococcus aureus and Gram negatives such as Klebsiella.

Why Salmonella species predominate in patients with sickle cell disease instead of Staphylococcus aureus is a matter of debate.

Etiology of Osteomyelitis Complicating Sickle Cell Disease. Pediatrics 1998;101;296-297



[Q: 3240] OnExamination 2012 - Rheumatology

A 50-year-old man presents with a two month history of progressive painless weakness affecting the proximal arms and legs.

He has noticed difficulty getting out of a low chair and some difficulty swallowing but denies any rashes or visual symptoms.

Investigations shows a CK of 5000 IU/l.

Which of the following is the most likely diagnosis?

- 1- Guillain-Barre syndrome
- 2- Hypothyroidism
- 3- Myasthenia gravis
- 4- Polymyalgia rheumatica (PMR)
- 5- Polymyositis

Answer & Comments

Answer: 5- Polymyositis

Polymyositis classically presents with relatively painless progressive proximal muscle weakness. Dysphagia is common but the ocular muscles are very rarely involved unlike myasthenia gravis where this is a predominant feature.

Diagnosis of polymyositis confirmed by elevated muscle enzymes (creatinine kinase) and typical EMG and muscle biopsy findings.

PMR is characterised by marked proximal stiffness and pain but rarely weakness and the muscle enzymes are typically normal.

Although hypothyroidism can present with a proximal myopathy and elevated creatine kinase (CK) levels the latter are rarely elevated above 500IU/l and dysphagia would not be typical.

Guillain-Barre syndrome causes demyelination and axonal degeneration, which results in acute, ascending and progressive neuropathy. 75% of patients have a history of preceding infection, usually of the respiratory and gastrointestinal tract. Mild rises in CK can be seen but they are not as marked as in polymyositis, and the progression of disease is much quicker.



[Q: 3241] OnExamination 2012 - Rheumatology

A study has been designed to investigate whether a certain drug plus physiotherapy treatment is better than drug treatment alone in the management of rheumatoid arthritis.

After randomising the patients a small proportion of the drug plus physiotherapy group decide to drop out of the study or omit some treatment sessions specified in the research protocol.

What is the correct way of analysing the subsequent data?

- 1- Assume the patients have withdrawn their consent

- 2- Exclude these patients from all analysis
- 3- Extend the trial recruitment to make up the numbers
- 4- Include these patient outcomes in the drug plus physiotherapy group
- 5- Interview the patients and report their group separately

Answer & Comments

Answer: 4- Include these patient outcomes in the drug plus physiotherapy group

This is the principle of 'intention to treat'.

It is possible that the physiotherapy intervention was harmful to the patients and this is why they left.

Intention to treat helps to reduce bias by sticking to the original allocation of treatment and analysing the patient in that treatment group even (and concentrate for this bit), even if they don't get it!



[Q: 3242] OnExamination 2012 - Rheumatology

A 55-year-old lady returns for her three month follow up in your inflammatory arthropathy clinic. She reports satisfactory symptom relief with 10 mg prednisolone daily after failing several other disease modifying agents. Her past medical history includes coeliac disease and Smith's fracture. You advise that this may be her long term treatment of choice.

Regarding preservation of bone mineral density, which further measures are necessary before proceeding?

- 1- Alendronate 70 mg weekly
- 2- Calcichew D3 forte
- 3- DXA scan and treat at T-score -1.5
- 4- DXA scan and treat at T-score -2.5
- 5- None of the above

Answer & Comments

Answer: 1- Alendronate 70 mg weekly

Learning points:

Bone mineral density measurement

Indications for bisphosphonate prophylaxis with glucocorticoid therapy

Specific bisphosphonate pharmacotherapy.

This lady has three independent risk factors for the development of osteoporosis (coeliac disease, previous fragility fracture, long term glucocorticoid therapy).

In the context (long term glucocorticoid therapy), due to her previous fragility fracture and irrespective of her age, this patient should be commenced on bisphosphonate therapy without the need for bone mineral density quantification with DEXA scanning.

Indications for bisphosphonate prophylaxis in glucocorticoid use for a period > 3 months

<65 years>65 year

+ fragility fracture*All patients

+ T score > -1.5

NB: if T score 0 to -1.5 repeat in 1-3 years.

* fragility fracture - defined by The World Health Organisation as resulting from a mechanical force equivalent to a fall from standing height or less which should not ordinarily cause a fracture.



[Q: 3243] OnExamination 2012 - Rheumatology

A 28-year-old lady presents to clinic with a one year history of intermittently painful fingers. The pain occurs commonly in low ambient temperatures and there is commensurate skin colour change from white to blue to red. Each episode lasts approximately 15 - 20 minutes.

She tells you that her mother suffered from rheumatoid arthritis and Raynaud's.

Which bedside test could you perform that may indicate an underlying connective tissue disorder as the probable diagnosis?

- 1- Capnography
- 2- Cold water challenge
- 3- Digital artery closing temperature
- 4- Finger systolic pressure
- 5- Nailfold capillaroscopy

Answer & Comments

Answer: 5- Nailfold capillaroscopy

Learning points:

Presentation and triggers of Raynaud's phenomenon (RP)

Clinical evaluation of RP

Characteristics suggestive of secondary RP

Connective tissue disease causes of RP.

This young woman gives a history consistent with Raynaud's phenomenon and has a positive family history of rheumatological disease.

Nailfold capillaroscopy is performed by applying a drop of oil onto the periungual region of the nail and using an ophthalmoscope set to 40 diopter to examine.

Observation of a relative paucity of capillary loops or enlarged and distorted loops is positively predictive of an underlying connective tissue disorder (for example, rheumatoid arthritis, mixed connective tissue disease, polymyositis, dermatomyositis, Sjögren's syndrome).

Finger systolic pressure and digital artery closing temperature are laboratory investigations for other potential secondary causes.

Cold water challenge is a provocation test that is no longer recommended as responses are inconsistent even in those with established RP.



[Q: 3244] OnExamination 2012 - Rheumatology

A 55-year-old homeless man presents with a six month history of periodic knee pains and aching legs. These have been occurring monthly and episodes last up to two weeks. He has noticed a 'bumpy' rash to his lower legs and complains of feeling more tired than usual. He has no significant past medical history.

He is currently reporting to a pharmacy daily for methadone.

Clinical examination demonstrated; pulse 88 (regular), normal heart sounds and chest sounds, painful but full active range of knee motion and palpable purpura to the lower extremities.

Blood tests revealed;

Hb 11.9 g/dL(13-18)

MCV 93fL(80 - 96)

WCC $9.8 \times 10^9/L$ (4 - 11)

ALT 150 iu/L(5 - 35)

AST 90 iu/L(1 - 31)

Complement C₄ 64 mg/dL(75-135)

Which test is most likely to assist you in the management of this man's illness?

- 1- ANA
- 2- Anti-CCP
- 3- Cryoglobulin serology
- 4- Hepatitis C serology
- 5- Rheumatoid factor

Answer & Comments

Answer: 4- Hepatitis C serology

Learning points:

Presentation of mixed cryoglobulinaemia (MCG)

Risk factors for (MCG)

Haematological profile of MCG.

This patient presents with palpable purpura, arthralgia and myalgia (that is, Meltzer's triad) seen in cryoglobulinaemia (types II/III).

The diagnosis is made using historical accounts, skin purpura, hypocomplementaemia and demonstration of circulating cryoglobulins.

Type II (mixed essential) cryoglobulinaemia is closely associated with persistent hepatic infection (transaminitis, inferred IVDU) most commonly hepatitis C and to a lesser extent hepatitis B.

Management involves treating the underlying cause in the absence of any immediate life, organ or limb threatening complications. In this case with pegylated interferon alpha and ribavirin.



[Q: 3245] OnExamination 2012 - Rheumatology

A 65-year-old woman is referred by her GP for a six month history of acute onset, progressively worsening shoulder pain, occurring bilaterally and associated with morning stiffness lasting approximately one hour.

The GP's letter states that basic bloods demonstrated:

Westergren ESR 55 mm/Hr - 30

CRP 1mg/L < 10

Rheumatoid factor titre 1:80 > 1:40

Which one of the following increases the probability of a diagnosis other than polymyalgia rheumatica?

1- Advanced age

2- Duration of morning stiffness

3- ESR 55 mm/Hr

4- Rheumatoid factor titre 1:80 mg/L

5- Symmetry of shoulder pain

Answer & Comments

Answer: 4- Rheumatoid factor titre 1:80 mg/L

Learning points:

Core inclusion criteria for polymyalgia rheumatica (PMR)

Exclusion criteria for PMR

Common differentials of PMR.

The other four answers form part of The British Society for Rheumatology core inclusion criteria for diagnosing polymyalgia rheumatica (PMR).

The core exclusion criteria include any evidence of activity in the following;

Infection

Cancer or

Giant cell arteritis.

Factors which reduce the probability of PMR include:

Other inflammatory rheumatic disease

Drug-induced myalgia

Chronic pain syndrome

Endocrine disease and

Neurological conditions, for example, Parkinson's.



[Q: 3246] OnExamination 2012 - Rheumatology

A 44-year-old woman has a three month history of progressive pain, swelling and stiffness in both wrists, and the majority of her metacarpophalangeal joints (MCPJs). The symptoms are worse in morning, and it takes an hour to loosen up her joints.

There have been no recent illness and there is no personal or family history of chronic skin conditions. She drinks alcohol occasionally.

On examination there is synovitis in both wrists, and MCPJs. Examination of skin, nails and other joints is normal.

These are results of recent blood tests:

Haemoglobin 13.1gm/dl(11.5 - 16.5 g/L)

WBC $8.2 \times 10^9/L$ (4 - $11 \times 10^9/L$)

Neutrophils $5.1 \times 10^9/L$ (1.5 - $7 \times 10^9/L$)

Platelets $280 \times 10^9/L$ (150 - $400 \times 10^9/L$)

ESR 48 mm/hr(0 - 20 mm/1st hr)

Rheumatoid factor: positive (1:256)(<30 k IU/L)

Urea, electrolytes and creatinine: Normal

What most appropriate first step in her long term management?

- 1- Anti-TNF α agents
- 2- Disease modifying antirheumatic drugs
- 3- Intra-articular corticosteroids
- 4- NSAIDs
- 5- Oral corticosteroids

Answer & Comments

Answer: 2- Disease modifying antirheumatic drugs

The symptoms, signs and blood results described above suggest a diagnosis of (RA).

Rheumatoid arthritis (RA) is a complex disease which has many manifestations, and management should attempt to address all aspects. The British Society of Rheumatology has published guidelines on the management of RA within the first two years.

These state that a diagnosis of RA should be made as early as possible, on the basis of persistent joint inflammation affecting at least three joints with early morning stiffness of at least 30 minutes. Such patients should have rapid access to a specialist team who

can help to plan care, including training patients to self-manage some aspects of their disease. Specialist rheumatology nurses have a critical role to play within this team, as do physiotherapists, podiatrists, occupational therapists, and occasionally psychologists.

If treatment is warranted, the first step is DMARD therapy (disease modifying anti-rheumatic drugs). All patients should have their disease and its impact assessed and documented at onset, prior to starting DMARD therapy. Treatment should then be started as soon as possible after the diagnosis is made, ideally within three months of the onset of persistent symptoms. The most commonly used DMARD is methotrexate. Such treatment should be part of an aggressive package of care, including escalating doses, intra-articular steroids, parenteral methotrexate and combination therapy. Once established on DMARD therapy, all patients should have a formal assessment of treatment response, or lack of it, in order to justify continuing therapy or changing it. These assessments can include measurement of CRP and disease activity scores such as DAS28. Remission should be documented prior to reducing therapy.

In addition to managing the musculoskeletal aspects of disease, it must not be forgotten that RA is a significant independent risk factor for ischaemic heart disease, and other risk factors should also be aggressively controlled.

Systemic steroids can have an important role in establishing disease control, or bridging gaps between different DMARD therapies, but long-term use is not justified. Intra-articular corticosteroid injections may be considered for symptom control during a mono- or oligo-articular flare of RA. This is a useful adjunct to therapy but is not appropriate long term management in itself.

Long-term use of NSAIDs should be at the lowest effective dose, and should be avoided in those with high cardiovascular risk.

Surgery may be indicated if any of the following persist, despite optimum medical therapy:

- Persistent pain as a result of joint or soft tissue damage
- Worsening joint function
- Progressive deformity
- Persistent localised synovitis
- Imminent or actual tendon rupture
- Nerve compression
- Stress fracture

There is little evidence for the long term efficacy of dietary change, or complementary therapies, although a Mediterranean diet should be recommended. Patients should be helped to contact support organisations. The role of fatigue should be recognised and managed. Aerobic exercise should be encouraged.

Over recent years, biological agents (especially inhibitors of tumour necrosis factor) have been developed. In the United Kingdom, anti-tumour necrosis factor (TNF) agents are used for the treatment of RA only if the patient fails to respond to an adequate trial of two DMARDs (for example, lefunomide, methotrexate, sulfasalazine, etc). However, even with these the frequency and degree of responses are restricted. Newer agents are therefore being introduced, including rituximab (anti-CD20), abatacept (cytotoxic T-lymphocyte antigen 4 immunoglobulin) and tocilizumab (anti-interleukin 6 receptor).



[Q: 3247] OnExamination 2012 - Rheumatology

A 66-year-old man has a painful, swollen right knee and difficulty in walking for three days.

He had two self-limiting episodes of severe pain and swelling in the right big toe last year. He drinks 26 cans of beer/week.

On examination, his temperature is 36.8°. The right knee is red, swollen, warm and tender and has restricted movement.

The knee aspirate shows no organisms on Gram stain, plenty of leucocytes, and negatively birefringent crystals on polarised light microscopy.

The results of recent blood tests are:

Hb 12.3 g/dl (13.0 - 18.0 g/dL)

WBC $14.3 \times 10^9/\mu\text{l}$ ($4 - 11 \times 10^9/\text{L}$)

Neutrophils 88% (40-75%)

Platelet $340 \times 10^9/\text{L}$ ($150 - 400 \times 10^9/\text{L}$)

Urea, electrolytes and creatinine: Normal

ESR 79 mm/hr (0 - 15 mm/1st hr)

Urate $521 \mu\text{mol/l}$ ($210-415 \mu\text{mol/l}$)

What is the most likely diagnosis?

- 1- Gout
- 2- Osteoarthritis
- 3- Pseudogout
- 4- Reactive arthritis
- 5- Septic arthritis

Answer & Comments

Answer: 1- Gout

Monosodium urate crystals are needle shaped and are negatively birefringent. Therefore, this patient has acute gout.

He has several risk factors for gout including

Age more than 40 years

Male gender

High alcohol consumption (more than 21 units for men, more than 14 units for women).

Pseudogout is caused by intra-articular shedding of calcium pyrophosphate dihydrate

(CPPD) crystals. CPPD crystals are rhomboid and show a weak positive birefringence on polarised light microscopy. Pseudogout is common at the knee but rarely leads to podagra.

There is no history of recent infections to suggest reactive arthritis.

Septic arthritis of the knee is less likely as the Gram stain is negative.

Osteoarthritis of the knee usually presents as chronic mechanical joint pain.



[Q: 3248] OnExamination 2012 - Rheumatology

A 65-year-old woman with chronic hepatitis C presents with a six week history of extensive non-blanching rash on her legs. She has also developed swelling and stiffness in the MCP and IP joints.

On examination, there is pitting oedema, her BP is 130/90 mm Hg, and urine dipstick shows 3+ proteins.

Recent blood tests are as follows:

Haemoglobin 13.1g/dl(11.5 - 16.5 g/dL)

WBC $8.2 \times 10^9/L$ (4 - $11 \times 10^9/L$)

Neutrophils $5.1 \times 10^9/L$ (1.5 - $7 \times 10^9/L$)

Platelets $280 \times 10^9/L$ (150 - $400 \times 10^9/L$)

ESR 48 mm/hr(0 - 30 mm/1st hr)

Bilirubin 27 $\mu\text{mol/L}$ (1 - 22 $\mu\text{mol/L}$)

Albumin 25 g/L(37 - 49 g/L)

Alkaline phosphatase 160 U/L(45 - 105 U/L (over 14 years))

Rheumatoid factor positive (1:2048) (< 30 k IU/L)

ALT 58 IU/L

Urea, electrolytes and creatinine: Normal

What is the diagnosis?

1- Cryoglobulinaemia

2- Hepato-renal syndrome

3- Polyarteritis nodosa

4- Rheumatoid arthritis

5- Systemic lupus erythematosus

Answer & Comments

Answer: 1- Cryoglobulinaemia

Mixed cryoglobulinaemia manifests as

Purpura

Cutaneous ulcers

Polyneuropathy

Membranoproliferative glomerulonephritis

and non-erosive polyarthralgia associates with hepatitis C.

Laboratory investigations show positive rheumatoid factor, low C4, active urine sediments, and type II or III serum cryoglobulins. There may be axonal polyneuropathy.

Active urinary sediment suggests the presence of membranoproliferative glomerulonephritis.

Polyarteritis nodosa associates with hepatitis B.



[Q: 3249] OnExamination 2012 - Rheumatology

A 55-year-old woman on treatment for longstanding rheumatoid arthritis has recently become short of breath on mild exertion and developed a dry cough.

Oxygen saturation was found to be 87% on air, and chest x ray showed a diffuse bilateral interstitial infiltrate. An extensive infection screen was negative and her symptoms were thought to be drug-induced.

Which drug is most likely to have caused this adverse effect?

1- Azathioprine

2- Cyclosporin

- 3- Hydroxychloroquine
- 4- Methotrexate
- 5- Sulphasalazine

Answer & Comments

Answer: 4- Methotrexate

Methotrexate is widely used in the management of rheumatoid arthritis.

Pneumonitis is a well-recognised and potentially fatal hypersensitivity reaction associated with methotrexate. It is far less predictable than other side effects associated with the drug. Typical symptoms include progressive dyspnoea, cough and fever.

On examination, patients are typically hypoxic and tachypnoeic and there may be audible crackles on chest auscultation. Chest radiographs reveal interstitial or alveolar infiltrate, concentrated within the lower lung fields. Spirometry demonstrates a restrictive pattern with reduced diffusion capacity. Lung biopsy is not specific but often reveals cellular interstitial infiltrates, granulomas or diffuse alveolar damage with perivascular inflammation.

These features are common to many drug-induced toxicities.

It is important to educate patients regarding the possibility of developing this adverse reaction. If suspected, methotrexate should be stopped, other causes investigated and supportive measures initiated. Some units recommend a pre-treatment chest x ray, although it remains unclear as to whether pre-existing respiratory disease increases the risk of pneumonitis.

Additional adverse effects associated with methotrexate include hepatic toxicity and neutropenia. There are guidelines for close monitoring for the development of these, centred on regular blood tests.

Side effects of cytotoxic agents is a common topic of MRCP examination questions. Those of which it is important to be aware include:

Azathioprine: commonly associated with mild bone marrow suppression. Should be used with caution in patients receiving allopurinol due to the risk of life-threatening bone marrow failure.

Cyclosporin: common side effects include hirsutism, liver dysfunction, gum hypertrophy and hypertension.

Hydroxychloroquine: may cause hair loss and 'bull's eye maculopathy'. Visual acuity should be monitored every six to 12 months.

Sulphasalazine: associated with pancytopenia.



[Q: 3250] OnExamination 2012 - Rheumatology

A 38-year-old publican with a two month history of bloody diarrhoea, abdominal pain, and weight loss presents with a three week history of painful and swollen left knee. There is no other significant past or family history.

Stool cultures done by her GP have been negative for C. difficile toxin, and have not grown any pathogenic organisms. On examination, the left knee is warm, tender, and there is a large effusion.

What is the most likely diagnosis?

- 1- Carcinomatous arthropathy
- 2- Gout
- 3- Inflammatory arthritis associated with inflammatory bowel disease
- 4- Reactive arthritis
- 5- Psoriatic arthritis

Answer & Comments

Answer: 3- Inflammatory arthritis associated with inflammatory bowel disease

This patient has chronic diarrhoea (more than two week duration), most likely to be due to inflammatory bowel disease (IBD).

IBD associates with asymmetric oligoarthritis. Knees and ankles are the most commonly affected joints.

The clinical course of peripheral joint (appendicular) inflammatory arthritis associated with IBD frequently follows the clinical course of gut disease. This form of enteropathic arthritis frequently remits after successful treatment of bowel disease.

IBD also associates with sacroiliitis (axial disease). There is no association between the clinical course of sacroiliitis and gut disease. It is worth bearing in mind that sacroiliitis may precede the onset of IBD by many years in some cases, and as outlined above may progress despite bowel resection.

Reactive arthritis is unlikely as the arthritis in reactive arthritis occurs a few weeks (4-6 weeks) after the resolution of infection. There is no risk factor of gout (age < 50 years, female gender, low alcohol intake), malignancy, and there is no personal or family history of psoriasis.



[Q: 3251] OnExamination 2012 - Rheumatology

A 55-year-old woman with longstanding well controlled seropositive RA, treated with methotrexate (20 mg/week) and folic acid 5 mg/day, presents with cough productive of green phlegm, fever (38.5°C), and severe sore throat.

On examination, the BP is 110/70 mmHg, SaO₂ is 98% on air, there is an occasional crackle at the right base. A chest x ray is normal. FBC, UEC, and LFTs are also normal. The CRP is 34 mg/L.

Which of the following is the most appropriate course of action?

1- IV antibiotics, continue methotrexate

2- IV antibiotics, stop methotrexate, and give folinic acid rescue

3- IV antibiotics, stop methotrexate temporarily

4- Oral antibiotics, continue methotrexate

5- Stop methotrexate

Answer & Comments

Answer: 3- IV antibiotics, stop methotrexate temporarily

The most likely diagnosis in this scenario is a lower respiratory tract infection.

In the setting of acute infection, most DMARDs (except hydroxychloroquine) should be discontinued until the infectious process has resolved. Whilst it is possible the infection could be successfully treated with oral antibiotics, there is not an option here which includes this with stopping methotrexate therefore .

Methotrexate is a folic acid antagonist. It can result in a pneumonitis that manifests with non-specific symptoms such as fever, fatigue, cough and dyspnoea. It is rare and the presence of a productive cough here makes the diagnosis less likely but if suspected methotrexate should be stopped immediately. Additional adverse effects include hepatotoxicity, alopecia, mouth ulcers and nausea. Folic acid should be given daily to reduce the incidence of these in patients treated with methotrexate.

Taken in overdose, methotrexate can cause multiple organ damage. Folinic acid is indicated and should be given intravenously as soon as it is suspected to limit toxicity. There is no suggestion of methotrexate overdose in this patient, and therefore folinic acid is not indicated.



[Q: 3252] OnExamination 2012 - Rheumatology

A 30-year-old man with longstanding psoriasis has a six week history of persistently swollen, painful, and tender right knee. The early morning stiffness lasts for over an hour, and he has partial relief from the use of NSAIDs.

He is negative for rheumatoid factor. A knee x ray is normal.

What is the next step in his long term management?

- 1- Alternative NSAID
- 2- Anti-TNF α agents
- 3- Disease modifying antirheumatic drugs (DMARDs)
- 4- Intra-articular corticosteroids
- 5- Oral corticosteroids

Answer & Comments

Answer: 3- Disease modifying antirheumatic drugs (DMARDs)

This patient has psoriatic arthritis and should be treated with a DMARD to prevent joint damage from proliferative/ erosive changes in psoriatic arthritis.

In the United Kingdom, anti-TNF agents are used for the treatment of psoriatic arthritis only if the patient fails to respond to an adequate trial of two DMARDs (for example, leflunomide, methotrexate, sulfasalazine).

Nonsteroidal anti-inflammatory drugs (NSAIDs) provide partial symptom relief and do not prevent progressive joint damage.

In patients with cutaneous psoriasis, systemic corticosteroids predispose to pustular psoriasis, and may result in a flare of skin psoriasis when they are stopped.

Intra-articular corticosteroid injections may be considered for symptom control during a mono- or oligo-articular flare of psoriatic arthritis. This is a useful adjunct to therapy

but is not appropriate long term management in itself.



[Q: 3253] OnExamination 2012 - Rheumatology

A 62-year-old woman presents with a one year history of worsening bilateral, anterior knee pain. The pain is increased by climbing stairs. Both knees are stiff for five to 10 minutes in morning. There is no history of knee swelling. The pain is partially controlled by paracetamol 1 g up to four times a day. She has a history of diabetes, and angina.

On examination, she is overweight. There is crepitus and during active and passive movement of both knees. There is no knee effusion. A recent knee x ray shows joint space narrowing in the medial tibio-femoral joint.

What is the next step in her management?

- 1- Acupuncture
- 2- Oral NSAIDs
- 3- Rest
- 4- Topical NSAIDs
- 5- Transcutaneous electrical nerve stimulation (TENS)

Answer & Comments

Answer: 4- Topical NSAIDs

This lady has osteoarthritis.

NICE guidelines recommend formulating individualised management plans for patients with osteoarthritis.

Behavioural change, such as exercise, weight loss and suitable footwear should be encouraged. Comorbidities which compound the effect of osteoarthritis symptoms should be identified and their treatment optimised.

Paracetamol and/or topical NSAIDs (for knee or hand OA) should be offered before considering oral NSAIDs.

If symptoms are not controlled with the above strategies, oral NSAIDs or COX-2 inhibitors (but not etoricoxib) can be used. A proton pump inhibitor should be co-prescribed. The lowest effective dose should be prescribed for the shortest period possible. If the patient is already taking low-dose aspirin, an alternative analgesic should be considered.

Treatments which are not recommended include rubefacients, intra-articular hyaluronan, electro-acupuncture and chondroitin or glucosamine products.

Adjuvants which can be used include opioid analgesics, topical capsaicin and intra-articular corticosteroids.

Application of heat or cold packs, or TENS, can be considered if other strategies are ineffective. Manipulation and stretching can be helpful, particularly for hip osteoarthritis. Bracing/joint supports can be used for patients with biomechanical joint pain or instability.

Patients should be referred for joint surgery if they have already been offered all of the core treatments or if they have refractory joint symptoms which have a substantial impact on their quality of life.

If there is a clear history of mechanical locking, referral for arthroscopic lavage and debridement should be considered.



[Q: 3254] OnExamination 2012 - Rheumatology

A 25-year-old lady with SLE (ANA positive, 1:1280), had a healthy term baby boy.

At the time of birth he was noted to have macular erythematous rash on his face, and trunk. He is otherwise well.

What is the most likely cause of his rash?

- 1- Discoid lupus erythematosus
- 2- Erythema toxicum

- 3- Neonatal lupus
- 4- Staphylococcus aureus
- 5- Systemic lupus erythematosus

Answer & Comments

Answer: 3- Neonatal lupus

This child has neonatal lupus.

Neonatal lupus is an uncommon condition associated with the transplacental passage of maternal anti-Ro and/or anti-La autoantibodies.

Findings may include

Cutaneous lupus lesions

Third-degree heart block

Cardiomyopathy

Hepatobiliary disease and

Cytopenias.

Typically only one organ is affected in each infant.

The most severe manifestation is the heart block, which usually begins during the second trimester of pregnancy. It is rare, occurring in only 2% of mothers with anti-Ro or anti-La antibodies. Once established this is permanent, unlike the other manifestations which are generally transient.

The rash is most frequently seen around the eyes, but also occurs in other parts of the body. Lupus presents as erythematous macular rash, on face or trunk, which may be photosensitive. Asymptomatic elevation of liver function tests is seen in 10-25% of cases. Overall, non-cardiac involvement is more common than cardiac.

A significant number of babies with neonatal lupus are born to mothers who are not known to have systemic lupus erythematosus.

Systemic lupus erythematosus does not occur in neonates.

Discoid lupus erythematosus presents with ulcers which heal with scarring.

The rash in erythema toxicum is papular, small, yellow-to-white coloured, and surrounded by red skin. This rash changes rapidly, appearing and disappearing in different areas over hours to days.

Staphylococcus aureus can cause impetigo and scalded skin syndrome, but these are not commonly seen in the immediate neonatal period.



[Q: 3255] OnExamination 2012 - Rheumatology

A 54-year-old man presents with a six day history of sharp shooting pain radiating from his back to the lateral aspect of his leg. The pain is associated with pins and needles.

On examination, he has sensory loss on the lateral aspect of leg, dorsum of foot, and there is a partial foot drop.

Which lumbar spine nerve root is affected?

- 1- L2
- 2- L3
- 3- L4
- 4- L5
- 5- S1

Answer & Comments

Answer: 4- L5

The L5 nerve root supplies sensation to the lateral aspect of leg and dorsum of foot (except for the lateral border which is supplied by S1). In addition, it supplies hip extensors, knee flexors (with S1), ankle dorsiflexors (with L4), and toe dorsiflexors.

RootDermatome distributionMyotome distributionTendon reflex

L1Skin above, and below the inguinal ligamentNoneNil

L2Upper anterior, and medial thighPsoas hip abductorsNil

L3Mid anterior, and medial thighPsoas quadricepsPatella (L3-4)

L4Medial aspect of leg, front of knee, and lower lateral thighTibialis anterior, extensor hallucisPatella (L3 - 4)

L5Lateral aspect of leg and dorsum of foot (except for the lateral border which is supplied by S1)Extensor hallucis, peroneal, gluteus medius, dorsiflexors, hamstringsPlantar (L5, S1-2)

S1Posterior lateral thigh and calfPeroneal, plantar flexorsAnkle (S1-2)

S3 - 5Medial buttock and perianal skin in a concentric manner with S3 most lateral, and s5 closest to the anusBladder, rectumAnkle (S1-2)



[Q: 3256] OnExamination 2012 - Rheumatology

A 52-year-old woman presents with increasing lower back pain for the last six months. The pain is increased by working as a floor-layer, and is worse in the evening.

There is no weight loss, night pain, or fever. Her back is stiff for 15 minutes in morning.

Over the last few months she has developed firm to hard swelling on several distal and proximal interphalangeal joints, and has anterior knee pain worsened by climbing stairs. A full blood count, ESR, and CRP done by the GP have been normal.

What is the diagnosis?

- 1- Ankylosing spondylitis
- 2- Discitis
- 3- Generalised osteoarthritis
- 4- Metastasis

5- Osteoporosis

Answer & Comments

Answer: 3- Generalised osteoarthritis

This patient has generalised osteoarthritis (GOA), as there are OA related symptoms in at least three joint areas, namely

Bony swellings at distal and proximal IPJs termed Heberden's and Bouchard's nodes respectively

Anterior knee pain, worse on climbing stairs, suggesting patella-femoral joint OA, and

Low back pain, suggesting spinal degenerative changes.

Ankylosing spondylitis typically occurs in young men, and associates with pronounced early morning stiffness and buttock pain.

Osteoporosis is not symptomatic, unless accompanied by a spinal fracture. Osteoporotic spinal fractures present with acute pain which improves over a period of few weeks to a couple of months.

There are no red-flag symptoms to raise the possibility of discitis or malignancy.



[Q: 3257] OnExamination 2012 - Rheumatology

A 25-year-old man complaining of low back pain and stiffness gradually increasing in severity for six months presents to the outpatient department.

He has no past medical history and the only medications he takes are anti-inflammatories that ease the pain.

On examination, his back movements are stiff with decreased range of movement due to pain, but the spine curvature is normal.

Which one of the options below is the most likely diagnosis?

1- Ankylosing spondylitis (AS)

2- Metastatic disease of the spine

3- Muscular strain

4- Reactive arthritis

5- Scheuermann's disease

Answer & Comments

Answer: 1- Ankylosing spondylitis (AS)

All of these can be causes of back pain. The key differentiators in this case are the age of the patient and the detailed history of the type of back pain.

A. Patients often present with AS in their 20s and 30s with a history of chronic back pain and stiffness. Key features of the pain include

Early morning stiffness of more than 30 minutes

Alternating buttock pain

Waking in the second half of the night

Pain easing with non-steroidal anti-inflammatory drugs (NSAIDs)

Pain which is worse with rest and eases with exercise.

B. Metastatic cancer can affect the spine and cause back pain. This is usually associated with 'red flag' signs suggesting malignancy. This diagnosis is less common in younger patients.

C. Muscular strain is the commonest cause of back pain in general practice but chronic pain for more than three months may indicate AS and should be investigated.

D. Reactive arthritis can cause inflammatory back pain with similar symptoms to AS but there is no history of preceding genitourinary or gastrointestinal infection.

E. Scheuermann's disease generally presents in teenagers with thoracic back pain and increased thoracic kyphosis, and therefore does not fit with this scenario.



[Q: 3258] OnExamination 2012 -
Rheumatology

A 42-year-old woman presents with a small joint polyarthritis and significant morning stiffness which has increased over the past few months.

On examination she has a symmetrical small joint polyarthritis affecting the proximal interphalangeal joints, metatarsophalangeal joints, wrists, elbows and knees; otherwise the physical examination is unremarkable.

Haemoglobin 12.0 g/dl(11.5-16)

White cell count $7.1 \times 10^9/L$ (4-10)

Platelets $201 \times 10^9/L$ (150-400)

Sodium 141 mmol/l (134-143)

Potassium 4.3 mmol/l (3.5-5)

Creatinine 82 $\mu\text{mol/l}$ (60-120)

Rheumatoid factor negative

Anti-CCP antibody Positive

Which of the following is the most likely diagnosis?

- 1- Polymyalgia rheumatica
- 2- Reactive arthritis
- 3- Rheumatoid arthritis
- 4- Seronegative arthritis
- 5- SLE

Answer & Comments

Answer: 3- Rheumatoid arthritis

Anticyclic citrullinated protein (CCP) antibodies were identified as early as the 1970s in patients with rheumatoid arthritis, but it is only recently that more specific assays have become available.

They are the most specific biomarker associated with the diagnosis of rheumatoid arthritis. It has been suggested that citrullination and the anticitrullinated peptide antibodies play a critical role in initiating the

inflammatory response within rheumatoid arthritis.

In patients with the clinical picture of rheumatoid arthritis who are rheumatoid factor negative, anti-CCP antibodies can aid in making the diagnosis between rheumatoid and other causes of arthritis.

Positive rheumatoid factor is associated with a worse prognosis in rheumatoid arthritis.

Polymyalgia rheumatica is associated with a markedly raised erythrocyte sedimentation rate (ESR) and is characterised by severe bilateral pain and morning stiffness of the shoulder, neck and pelvic girdle.

Reactive arthritis is the triad of arthritis, urethritis and conjunctivitis which is classically associated with sexually transmitted or gastrointestinal infection.

Seronegative arthritis is a heterogeneous group of inflammatory rheumatic disease with predominant involvement of axial and peripheral joints, and enthesitis.

There is a high incidence of HLA-B27, but rheumatoid factor is typically negative. Diseases belonging to this group include ankylosing spondylitis, reactive arthritis, psoriatic arthritis and Behcet's disease.

Systemic lupus erythematosus (SLE) is a heterogeneous, multisystem, inflammatory autoimmune condition which is characterised by positive antinuclear antibodies.



[Q: 3259] OnExamination 2012 -
Rheumatology

A 17-year-old girl who had completed treatment for acute lymphoblastic leukaemia six months previously presents with a short history of marked, right hip pain and associated limp.

What is the most likely diagnosis?

- 1- Avascular necrosis of the femoral head
- 2- Gout

- 3- Osteoarthritis
- 4- Pseudogout
- 5- Septic arthritis

Answer & Comments

Answer: 1- Avascular necrosis of the femoral head

Avascular necrosis of the femoral head can occur as a consequence of her treatment or the disorder itself.

At age 17 osteoarthritis is particularly unlikely.

Gout, too, is unlikely (considering she completed treatment six months ago) unless she had relapsed (high white cell count) or had some other risk factors.

She would be considered to be no more likely to get septic arthritis or pseudogout than anyone who had not previously had acute lymphoblastic leukaemia, if in remission.



[Q: 3260] OnExamination 2012 - Rheumatology

A 40-year-old man presents with acute monoarthritis of the right knee.

Gout is confirmed following joint aspiration and examination of the fluid under polarised light microscopy. He underwent endoscopy three weeks earlier because of dyspepsia and this confirmed a duodenal ulcer.

Which of the following would be the best initial treatment for him?

- 1- Allopurinol
- 2- Indomethacin alone
- 3- Indomethacin and lansoprazole
- 4- Indomethacin and misoprostol
- 5- Intra-articular corticosteroid injection

Answer & Comments

Answer: 5- Intra-articular corticosteroid injection

The principles of treating an acute episode of gout are:

Commence anti-inflammatory medication immediately, and continue for two weeks - non-steroidal anti-inflammatory drugs (NSAIDs) are first line in conjunction with gastro-protective medication where indicated; colchicine is an alternative but is slower to work and can be associated with significant diarrhoea

Rest the affected joints

Allopurinol should not be started during an acute attack but in patients already established on allopurinol it should be continued

If diuretics are being used to treat hypertension an alternative antihypertensive should be considered, but they should not be stopped in the presence of heart failure

Corticosteroids are highly effective, and can be used where NSAIDs are not tolerated, or in refractory disease (intra-articular, oral, intramuscular, intravenous).

In this scenario, NSAIDs are contraindicated due to the presence of active gastrointestinal ulceration. Even with coadministration of a gastroprotective medication (for example, lansoprazole or misoprostol) the risk of haemorrhage or perforation is too high to use NSAIDs in this case.

Initiation of allopurinol can prolong an acute attack of gout due to shifts in uric acid levels. It is therefore recommended only one to two weeks after the resolution of symptoms, usually with colchicine cover.

Intra-articular corticosteroids is therefore the most appropriate answer in this case. If available, colchicine would be a reasonable option but it can be associated with

significant gastrointestinal toxicity. The systemic absorption from intra-articular corticosteroids is extremely low, and as you are bypassing the intestine they do not carry risk of peptic ulceration associated with oral corticosteroid use.

Potential local side effects of corticosteroid injections include increased pain for the first couple of days, septic arthritis, subcutaneous atrophy (causing skin dimpling), skin depigmentation, accidental nerve injury and tendon rupture.

Reference:

British Society for Rheumatology and British Health Professionals in Rheumatology Guideline for the Management of Gout. Jordan KM et al. Rheumatology 2007;46:1372-1374.



[Q: 3261] OnExamination 2012 - Rheumatology

A 55-year-old gentleman has been taking methotrexate 7.5 mg weekly for seronegative erosive rheumatoid arthritis with considerable clinical and symptomatic improvement. He has been on this dose for three months.

His most recent investigations, performed two days ago, reveal the following:

Haemoglobin 12.9 g/dl (12-16.5)

White cell count $5.3 \times 10^9/L$ (4-11)

Platelets $183 \times 10^9/L$ (150-400)

Urea 4.2 mmol/l (2.5-7.5)

Creatinine 88 $\mu\text{mol/l}$ (60-110)

Alkaline phosphatase 92 U/l (60-110)

AST 22 U/l (1-31)

ALT 15 U/l (5-35)

When should the next FBC be performed?

- 1- One week
- 2- Two weeks
- 3- One month
- 4- Six months

5- One year

Answer & Comments

Answer: 3- One month

His results are normal and he is receiving a stable dose of methotrexate.

The most appropriate time interval for monitoring his full blood count (FBC) according to current UK guidance would therefore be in one month.

Clinicians are recommended to check FBC fortnightly until 6 weeks after the last dose increase. Provided it is stable, it can be checked monthly thereafter until the dose and disease is stable for one year. Thereafter monitoring is guided by clinical judgement. If white cell count is less than 3.5, neutrophils less than 2 or platelets less than 150, methotrexate should be withheld pending discussion with the specialist team. An MCV greater than 105fL warrants checking B12, folate and TSH and treating any abnormality. If these are normal, discuss with the specialist team.

Liver function tests should be checked three monthly. If there is an unexplained decrease in albumin, or AST/ALT twice the upper limit of normal, the specialist team should be informed.

Urea, creatinine and electrolytes should be checked six monthly. If the estimated glomerular filtration rate falls below 50mL/minute, methotrexate should be withheld until the result has been discussed with the specialist team.

In addition to this monitoring, any clinical signs of toxicity should be monitored for. If the patient develops rash, oral ulceration, nausea, vomiting or diarrhoea, methotrexate should be withheld until discussed with the specialist team. Any new or increasing dyspnoea or dry cough should be urgently discussed with secondary care, and

methotrexate withheld. A sore throat or abnormal bruising should be investigated with an FBC, and methotrexate withheld until the results available.



[Q: 3262] OnExamination 2012 - Rheumatology

A 71-year-old man with a history of chronic renal impairment and atrial fibrillation for which he takes warfarin, presents with an acutely tender and red left big toe.

Investigations reveal:

Serum Creatinine 200 micromol/l (50-100)

Serum urate 0.5 mmol/l (0.12-0.42)

Which of the following is the most appropriate treatment for this man's presentation?

- 1- Allopurinol
- 2- Colchicine
- 3- Diclofenac
- 4- Paracetamol
- 5- Prednisolone

Answer & Comments

Answer: 5- Prednisolone

This man presents with acute gout, has chronic renal impairment, AF and takes warfarin.

Non-steroidal anti-inflammatory drugs (NSAIDs) would be the treatment of choice but may cause a deterioration in renal function and would be associated with an increased risk of bleeding in the elderly.

The adverse effects of colchicine (especially gastrointestinal symptoms) would be more likely in the elderly and should probably be avoided in those with renal impairment of this degree.

Thus steroids are probably the best option.

Allopurinol may well precipitate/exacerbate acute gout and is used once the acute attack has settled following adequate treatment.

This is a classic MRCP question since it is hard to answer this by just looking in textbooks. Steroids are the last resort choice where NSAIDs and colchicine are deemed too dangerous to use and that is a matter of judgement applied by physicians. There is plenty of evidence for their efficacy. Ann Emerg Med. 2007 May;49(5):670-7



[Q: 3263] OnExamination 2012 - Rheumatology

A 73-year-old female presents with difficulty opening jars and bottles.

On examination there is tenderness with crepitus and bony swelling over the base of the first metacarpal and wasting of the right thenar eminence.

Investigations reveal an ESR of 30 mm/1st hr (0-20), a C-reactive protein of 8mg/L (<10), a urate concentration of 0.40 mmol/L (0.19-0.36) and a rheumatoid factor was 60 IU/L (<30).

An x ray of the right hand showed a loss of the joint space with articular sclerosis and osteophytes of the first carpo-metacarpal joint.

What is the most likely diagnosis?

- 1- DeQuervain's tenosynovitis
- 2- Gouty arthritis
- 3- Osteoarthritis
- 4- Pyrophosphate arthritis
- 5- Rheumatoid arthritis

Answer & Comments

Answer: 3- Osteoarthritis

This woman has clinical and radiological features consistent with osteoarthritis (OA) of the first right carpometacarpal (CMC) joint. Osteoarthritis is one of the most common

joint disease, and its incidence is increasing with the age and weight of the population. It is characterised by joint pain, crepitus, stiffness after mobility, and limitation of motion, commonly affecting the knees, hips and small joints of the hand. The CMC joint is classically involved, and involved in gripping and twisting. Joint swelling is bony in nature, unlike the boggy swelling which occurs in inflammatory arthritis. Thenar wasting occurs in OA of the first CMC joint due to disuse.

Pathogenesis involves the localised loss of cartilage, with remodelling of adjacent bone. The associated pain is exacerbated by exercise and relieved by rest, although in advanced disease rest and night pain can develop. There may also be joint stiffness, typically in the morning or after rest. Diagnosis is often late, and treatment is usually aimed at reducing pain and improving function rather than targeting the disease process.

This woman's erythrocyte sedimentation rate (ESR) is not significantly raised and her C reactive protein (CRP) is within normal range making an inflammatory arthritis such as rheumatoid arthritis unlikely.

A positive rheumatoid factor does not make the diagnosis of rheumatoid arthritis. The frequency of positive rheumatoid factor in normal individuals of age over 70 is upto 10-20%.

The predominant feature of gouty arthritis is pain, and it rarely affects the hands. Pyrophosphate arthropathy can complicate osteoarthritis but it usually presents with acute onset large joint monoarthritis.

De Quervain's disease is a common pathology which consists of a stenosing tenosynovitis of the first dorsal compartment of the wrist. It typically presents with pain on the radial aspect of the wrist, with associated swelling and tenderness. Treatment is with splinting, with or without corticosteroid injection.



[Q: 3264] OnExamination 2012 - Rheumatology

A 30-year-old woman presents with Raynaud's phenomenon.

Which one of the following clinical features suggests an underlying connective tissue disease?

- 1- Episodes lasting in excess of one hour
- 2- Involvement of toes
- 3- One previous miscarriage in early pregnancy
- 4- Symmetrical involvement of fingers
- 5- Symptoms developed as a teenager

Answer & Comments

Answer: 1- Episodes lasting in excess of one hour

Raynaud's phenomenon is a common clinical presentation, which may be primary or secondary to underlying disease.

It can be diagnosed if there is a history of clearly demarcated pallor of the digit(s) followed by at least one other colour change (cyanosis and/or erythema). Symptoms are usually precipitated by cold (or less commonly emotion). Vasospasm without endothelial damage is thought to be the main cause for primary RP. The pathogenesis of secondary forms is probably initiated primarily by endothelial damage.

Physical examination, nailfold capillaroscopy and immunological tests can differentiate between primary and secondary Raynaud's.

You should suspect secondary Raynaud's phenomenon if any of the following are present:

Onset at more than 30 years of age

Intense, painful or asymmetrical episodes

Presence of additional clinical features suggestive of underlying disease

Positive anti-nuclear antibody

Abnormal nail-fold capillaries

Digital ulcers, gangrene or severe ischaemia of one or more digits.

Primary Raynaud's can be diagnosed if all the following are present:

No suspicion of underlying disease

Symmetrical episodes affecting both hands, but not necessarily all fingers

No tissue necrosis, ulceration, gangrene or severe ischaemia

Normal nail-fold capillaries

Normal ESR and negative anti-nuclear antibodies.

Treatment involves prevention so that permanent ischaemic damage can be avoided. Patients should avoid exposure to the cold.

The mild forms of primary RP can be controlled by non-pharmacological approaches alone. If insufficient, the first choice therapy is calcium channel blockers. In severe forms, intravenous prostaglandin, endothelin-1 receptor antagonists and phosphodiesterase-5 inhibitors are used.

Future treatment options may include selective alpha-2c adrenergic receptor blockers, tyrosine and Rho-kinase inhibitors and calcitonin gene-related peptide.

Differential diagnosis of Raynaud's phenomenon includes:

Chilblains (perniosis): erythematous itchy swellings on fingers and toes in response to cold

Acrocyanosis: continuous blueness of the extremities aggravated by cold

Erythromelalgia: painful erythema caused by paroxysmal dilatation of blood vessels

Vascular embolism

Livedo reticularis

Mottled, cyanotic discolouration of skin.

All the other features described here would be consistent with a diagnosis of primary Raynaud's disease.

Whilst miscarriage can be associated with connective tissue disease, in particular antiphospholipid syndrome, it is common in the population especially in early pregnancy.



[Q: 3265] OnExamination 2012 - Rheumatology

A 26-year-old male presents with a three month history of arthralgia, mouth ulceration and eye irritation.

On examination he was afebrile, had some ulceration of the mouth, bilaterally swollen wrists and effusions, with reduced range of movements of both knees.

Examination of the external genitalia revealed a scrotal ulcer.

His investigations showed:

White cell count $12 \times 10^9/L$ (4-11)

C reactive protein 120 mg/l (<10)

Rheumatoid factor negative

What is the most likely diagnosis?

1- Behçet's syndrome

2- Inflammatory bowel disease

3- Psoriatic arthritis

4- Reiter's syndrome

5- Sjögren's syndrome

Answer & Comments

Answer: 1- Behçet's syndrome

This man has Behçet's on the basis of his orogenital ulceration and oligoarthritis.

Behçet's syndrome is a multisystem disorder characterised by:

Recurrent oral and genital ulceration

Eye lesions (anterior or posterior uveitis or retinal vasculitis)

Skin lesions (erythema nodosum, papulopustular lesions or folliculitis)

A positive pathergy test (although this is rarely done in clinical practice).

Other features include

Musculoskeletal involvement with a mono- or oligoarthropathy

Venous thromboembolism

Neurological and

Gastrointestinal features.

Reiter's syndrome is a clinical triad of urethritis, conjunctivitis and arthritis after an infective dysentery. It is now referred to as reactive arthritis.

Genital ulceration is not a feature of systemic lupus erythematosus, rheumatoid arthritis or Sjögren's syndrome.

Inflammatory bowel disease can be associated with an oligoarthropathy, occasionally with uveitis, but you would expect a strong history of gastrointestinal symptoms.



[Q: 3266] OnExamination 2012 - Rheumatology

A 68-year-old woman presents to the casualty department with a two day history of pain and swelling of the right ankle. She could not recall any history of recent trauma.

On examination she was febrile, temperature 38.1°C. The right ankle was swollen and very tender with a reduced range of movement.

Which of the following investigations would be of most help in establishing the diagnosis?

- 1- Aspiration of the right ankle
- 2- Blood cultures
- 3- Erythrocyte sedimentation rate
- 4- Serum urate level
- 5- x Ray of the right ankle

Answer & Comments

Answer: 1- Aspiration of the right ankle

Septic arthritis is a medical emergency and this is the most likely diagnosis in this case. It is essential that the joint is aspirated in order to establish a microbiological diagnosis that will guide appropriate treatment.

All of the other investigations listed would be of value in managing this patient, but in this setting joint aspiration is critical.



[Q: 3267] OnExamination 2012 - Rheumatology

A 29-year-old professional singer presents with a prolonged history of epistaxis and rapidly progressive shortness of breath.

The KCO and eosinophil count are raised.

Which of the following is the most likely diagnosis?

- 1- Alveolar proteinosis
- 2- Churg-Strauss syndrome
- 3- Goodpasture's syndrome
- 4- Microscopic polyangiitis
- 5- Wegener's granulomatosis

Answer & Comments

Answer: 5- Wegener's granulomatosis

This patient has shortness of breath and a raised KCO, which leads to you to a diagnosis of alveolar haemorrhage. The condition which links epistaxis and alveolar haemorrhage in the list above is Wegener's granulomatosis. KCO measures the uptake of carbon

monoxide by the lungs, and is equivalent to the transfer factor.

Wegener's granulomatosis is a multi-organ autoimmune disease, which can be fatal. The classical triad consists of necrotising granulomatous inflammation of the respiratory tract, glomerulonephritis and a small-vessel vasculitis. A prolonged history of epistaxis or sinusitis is commonly found in Wegener's granulomatosis, which in some patients is also associated with an eosinophilia. The detection of antineutrophil cytoplasmic antibodies directed against proteinase-3 is highly specific, but is found in only 50% of patients with disease localised to the respiratory tract and 95% with generalised Wegener's.

Standard therapy is with cyclophosphamide and corticosteroids. TNF-alpha blocking agents, anti-thymocyte globulin and monoclonal anti T-cell antibodies can be used in disease refractory to these agents.

Systemic inflammation and vasculitis contribute to accelerated atherosclerosis in patients with Wegener's and there is therefore a significantly increased incidence of stroke, myocardial infarction and occlusive artery disease.

Alveolar proteinosis is a rare diffuse lung condition, characterised by alveolar and interstitial accumulation of phospholipid protein derived from surfactant. It can be congenital, secondary or acquired, and patients often present with recurrent respiratory infections. Transfer factor (KCO) is typically reduced.

Churg-Strauss syndrome is a rare systemic vasculitis which affects small and medium sized vessels, in association with asthma. Patients initially present with allergic rhinitis and asthma, followed by eosinophilia and associated infiltrative disease (e.g. gastroenteritis) and then granulomatous inflammation classically within 3 years.

Goodpasture's syndrome is an important, and potentially rapidly fatal, cause of alveolar haemorrhage. It is caused by circulating antiglomerular basement membrane antibodies, and typically causes an acute glomerulonephritis. Epistaxis is not as common an association.

Microscopic polyangiitis is a small vessel vasculitis which classically spares the upper respiratory tract.



[Q: 3268] OnExamination 2012 - Rheumatology

A 40-year-old woman presents with a year history of Raynaud's phenomenon, dyspepsia and arthralgia.

On examination she has sclerodactyly and synovitis of the small joints of the hands. Her ESR is 40 mm/hr (<20, antinuclear antibody (ANA) is positive and rheumatoid factor is negative.

Which one of the following is most likely to develop as a further complication of this disorder?

- 1- Anterior uveitis
- 2- Butterfly rash
- 3- Erosive joint disease
- 4- Erythema nodosum
- 5- Malabsorption

Answer & Comments

Answer: 5- Malabsorption

Systemic sclerosis is a chronic autoimmune disease characterised by increased fibroblast activity and fibrosis in a number of different organ systems. 90-95% of patients have positive antinuclear antibodies. There are two major subtypes: limited cutaneous and diffuse cutaneous. CREST syndrome is an older term for the limited cutaneous form (calcinosis, Raynauds' phenomenon, oesophageal dysmotility, sclerodactyly,

telangiectasia). Patients with systemic sclerosis can present with skin abnormalities, musculoskeletal changes, gastrointestinal complications, pulmonary disease, renal crisis and dry eyes and mouth.

Involvement of the gastrointestinal tract can occur from mouth to anus with varying degrees of severity. It can be present in those with both the diffuse and limited cutaneous forms. Most GIT manifestations result from dysmotility secondary to infiltration of the intestinal wall with fibrous tissue, and can cause life-threatening malabsorption and malnutrition.

Gastric emptying is delayed in 10-75% of patients and causes symptoms of early satiety, bloating and emesis. Treatments include metoclopramide and erythromycin. The small bowel is also involved in 20-60% of patients, due to reduced or absent migrating motor complexes predisposing to bacterial overgrowth. This contributes to malabsorption, as does associated pancreatic insufficiency. In the colon there is often development of diverticuli involving all layers of the intestinal wall, or constipation due to reduced motility.

Anterior uveitis can be associated with ankylosing spondylitis, reactive arthritis, inflammatory bowel disease, sarcoidosis and Behcet's disease. None of these have clinical features which fit with the description above.

A malar, or butterfly rash, is classically associated with systemic lupus erythematosus. It involves the bridge of the nose, but spares the naso-labial folds. It is usually well demarcated and macular. It is not pathognomonic of SLE, and can be seen in pellagra and dermatomyositis, but again none of these would account for the symptoms described above.

Erosive arthritis and erythema nodosum have a variety of different causes, but neither are commonly associated with systemic sclerosis.



[Q: 3269] OnExamination 2012 - Rheumatology

Bone densitometry performed on a 48-year-old woman demonstrates bone mass decreased more than 2 standard deviations below the mean for her age in her left femoral head, wrist, and lumbar vertebral region.

Six months later the amount of bone loss is seen to be increased by repeat densitometry examination.

These findings are most likely to be associated with which of the following serum laboratory test abnormalities?

- 1- Cortisol of 2060 mmol/l (110 - 607)
- 2- Intact parathormone of 5 pmol/l (1.2 - 5.8)
- 3- Total cholesterol of 10 mmol/l (< 5.17)
- 4- Total serum globulin of 35 g/l
- 5- Uric acid of 930 µmol/l (149 - 446)

Answer & Comments

Answer: 1- Cortisol of 2060 mmol/l (110 - 607)

She has osteoporosis with decreased bone mass. Most cases do not have a specific aetiology, but Cushing's syndrome with hypercortisolism can promote osteoporosis. Her age should make you suspicious.

Hypoparathyroidism is not going to accelerate bone loss. The bone resorption that accompanies hyperparathyroidism can cause osteoporosis.

Over 95% of cases of osteoporosis are 'primary' with unknown cause. Elevated serum globulin should make you suspect a monoclonal gammopathy, but myeloma leads to focal bone lytic lesions.

Hyperuricaemia can be associated with gout that can cause focal bone destruction near affected joints, the bone mass overall is not decreased.



[Q: 3270] OnExamination 2012 -
Rheumatology

A 52-year-old woman presents with a two week history of malaise and lower limb joint pain, associated with a vasculitic rash over her shins, thighs and buttocks.

Investigations revealed:

Haemoglobin 9.8 g/dL (11.5-16.5)

Platelet count $275 \times 10^9/L$ (150-400 $\times 10^9$)

Serum creatinine 452 $\mu\text{mol/L}$ (60-110)

Antinuclear antibodies negative

Antineutrophil cytoplasmic antibodies negative

Antiglomerular basement membrane antibodies negative

Dipstick urinalysis Blood +++, protein +

What is the most likely diagnosis?

- 1- Amyloidosis
- 2- Haemolytic uraemic syndrome (HUS)
- 3- Henoch-Schönlein purpura
- 4- Membranous nephropathy
- 5- Myeloma

Answer & Comments

Answer: 3- Henoch-Schönlein purpura

The distribution of the rash together with lower limb joint pains and renal involvement are most suggestive of Henoch-Schönlein purpura (HSP).

HSP is a small vessel vasculitis mediated by IgA-immune complex deposition. It is characterised by the tetrad of purpura, abdominal pain, arthritis, and renal involvement (haematuria and proteinuria). The diagnosis can be easily missed, and a high degree of suspicion is required. Skin biopsy and immunofluorescence demonstrate leukocytoclastic vasculitis with IgA deposition, which is pathognomonic for HSP.

90% of cases of HSP occur in children aged 2-10 years but can occur in any age group. It is typically commoner in males, and may follow an infectious agent. An important risk factor for the development of HSP in adults is thought to be chronic alcohol intake. A variety of disorders have been associated with HSP in adults, including *Helicobacter pylori*, hepatitis B and malignancy. In some cases, overlap with polyangiitis or polyarteritis-like disease is seen.

Management of HSP in adults often involves the use of immunomodulatory or immune-suppressive regimens (in contrast to children where the majority of cases resolve spontaneously). There is often a more complicated course in adults, and 50% of patients who present with renal involvement develop renal insufficiency. In addition to renal disease, cardiac, pulmonary, ocular, gastrointestinal and neurological complications have been described.

Amyloidosis is a clinical disorder caused by extracellular and/or intracellular deposition of insoluble abnormal amyloid fibrils, which alter normal tissue function. It is classified chemically and is associated with a number of different conditions. There is typically a combination of symptoms which affect more than one system, including massive proteinuria, peripheral neuropathy, hepatomegaly and heart failure. A vasculitic rash affecting the lower limbs is not typical.

Haemolytic uraemic syndrome (HUS) is a triad of microangiopathic haemolytic anaemia, thrombocytopenia and acute renal failure. It is most commonly associated with *Escherichia coli* O157:H7. The classical presentation is profuse diarrhoea with blood, and the absence of this in the above scenario makes HUS unlikely.

Membranous nephropathy is a histological diagnosis and usually presents with proteinuria without haematuria. 85% of cases are idiopathic, and the remainder are

secondary to autoimmune conditions (SLE), infection (hepatitis B), drugs (captopril, NSAIDs) and malignancy.

In myeloma there is malignant proliferation of plasma cells, which produces marrow infiltration and overproduction of a monoclonal antibody detectable in serum and/or urine (Bence Jones protein). Common presenting features include pathological fractures, anaemia, anorexia, bruising and infection. Myeloma can rarely cause vasculitis which is antineutrophil cytoplasmic antibody (ANCA) negative but this is rare and less likely than HSP in this scenario.



[Q: 3271] OnExamination 2012 - Rheumatology

A 50-year-old woman presents with dry eyes, a dry mouth, an erythematous rash and polyarthralgia.

Investigations show:

Anti-nuclear antibody Strongly positive (1:1600)

Anti-Ro/SSA antibodies Strongly positive

Rheumatoid factor Positive

IgG 45 g/L (<15)

IgM Normal

IgA Normal

Kappa/lambda ratio Normal

What is the most likely diagnosis?

- 1- Hyperviscosity syndrome
- 2- Myeloma associated vasculitis
- 3- Primary Sjogren's syndrome
- 4- Rheumatoid arthritis with secondary Sjogren's syndrome
- 5- Systemic lupus erythematosus

Answer & Comments

Answer: 3- Primary Sjogren's syndrome

The clinical features and the serology are typical of primary Sjögren's syndrome (occurs alone and more likely to have positive anti-Ro SSA antibodies than secondary Sjogren's).

Hypergammaglobulinaemia is present in 80% of individuals.

ANA and anti-Ro/SSA antibodies are present in approximately 90% of individuals as is a weakly positive rheumatoid factor.

The normal kappa/lambda ratio confirms the hypergammaglobulinaemia is polyclonal.

Typically secondary Sjogren's has pre-existent rheumatoid or SLE before the development of Sjogren's symptoms.



[Q: 3272] OnExamination 2012 - Rheumatology

A 20-year-old woman presents with typical erythema nodosum. She has a low grade fever and bilateral ankle arthritis but no other symptoms and has no medical history. There is no history of travel abroad and she is on no medication.

Which of the following would be the most appropriate investigation for this patient?

- 1- Barium enema
- 2- Chest x ray
- 3- Erythrocyte sedimentation rate (ESR)
- 4- Upper gastrointestinal (GI) endoscopy
- 5- Viral titres

Answer & Comments

Answer: 2- Chest x ray

Erythema nodosum is commonly idiopathic.

It can also be related to streptococcal infections, acute sarcoidosis or related to drugs such as the oral contraceptive pill, sulphonamides and penicillins.

Rarer causes include inflammatory bowel disease, tuberculosis, Behçet's disease and other connective tissue disorders.

In this case, a chest x ray would be the most helpful investigation as this may identify bilateral hilar lymphadenopathy which together with a bilateral ankle arthropathy would strongly support a diagnosis of acute sarcoidosis.

Investigation of the bowel is unlikely to help in the absence of any bowel symptoms.

Viral titres and ESR are non-specific.



[Q: 3273] OnExamination 2012 - Rheumatology

Which of the following auto-antibodies may have a role in monitoring disease activity?

- 1- Anti-ds DNA antibodies in systemic lupus erythematosus (SLE)
- 2- Antinuclear antibodies in systemic lupus erythematosus
- 3- Anti-Ro (SSA) antibodies in Sjogren's syndrome
- 4- Anti-Sm antibodies in systemic lupus erythematosus
- 5- Rheumatoid factor in rheumatoid arthritis

Answer & Comments

Answer: 1- Anti-ds DNA antibodies in systemic lupus erythematosus (SLE)

The serum levels of anti-dsDNA antibodies appear to correlate with disease activity in many patients and often levels will rise just before a flare of disease.

The relationship is not close enough to be able to alter treatment based on a rising titre of antibodies but patients should be followed more closely in this situation.

Anti-Sm antibodies are very specific for SLE but not sensitive and there is no evidence that levels change with disease activity.

The only other autoantibody where there may be some correlation between levels and disease activity is circulating anti-neutrophil cytoplasmic antibody (cANCA) in Wegener's granulomatosis.



[Q: 3274] OnExamination 2012 - Rheumatology

A 50-year-old man presents with lethargy, polyuria, polydipsia and pain and stiffness of the hands.

He has evidence of an arthropathy affecting the second and third metacarpo-phalangeal (MCP) joints of both hands with radiographic evidence of degenerative disease at these sites. He also has 5 cm hepatomegaly.

Which of the following is the most likely diagnosis?

- 1- Gout
- 2- Haemochromatosis
- 3- Osteoarthritis
- 4- Pyrophosphate arthropathy
- 5- Rheumatoid arthritis with amyloidosis

Answer & Comments

Answer: 2- Haemochromatosis

This gentleman has haemochromatosis. The typical presenting features are diabetes, bronzing of the skin, hepatomegaly (due to iron deposition) and arthropathy (especially of the second and third metacarpophalangeal joints, with hook-like osteophytes on x-ray). Occasionally the arthropathy affects larger joints such as the hips, knees and shoulders and can resemble rheumatoid arthritis. Other rheumatic manifestations include acute pyrophosphate arthropathy, asymptomatic chondrocalcinosis and osteoporosis.

Hereditary haemochromatosis is an autosomal recessive disorder, so taking a family history is helpful in these cases. Affected patients are at increased risk of

cirrhosis and hepatocellular carcinoma. Regular phlebotomy is the main treatment, although iron chelation and therapeutic erythrocytapheresis may become more widely used in the future.

The second and third metacarpophalangeal joints are rarely affected in isolation in osteoarthritis, and this would not explain the hepatomegaly and symptoms of diabetes.

The distribution of the arthropathy, and associated polyuria and polydipsias are not typical for gout or pseudogout (pyrophosphate arthropathy).

Amyloidosis secondary to rheumatoid arthritis would account for the hepatomegaly and small joint arthropathy, but diabetes is very rarely a consequence. Typically there is a combination of symptoms such as fatigue, weight loss, peripheral oedema and polyneuropathy.

Reference:

Diagnosis and management of hereditary haemochromatosis. Bokhoven et al. BMJ 2011 Jan 19;342:c7251



[Q: 3275] OnExamination 2012 - Rheumatology

A 21-year-old woman presents with a six month history of bilateral wrist pain, generalised aching, morning stiffness and an intermittent subjective fever.

She has a medical history of grade 4 acne, which she states has become worse over her nasal bridge and cheeks despite being commenced on minocycline one year ago. She tells you that her mother has rheumatoid arthritis.

An autoimmune screen demonstrated positivity for ANA, P-ANCA and anti-DNA histone; negative anti-ds DNA antibody; normal complement C3, C4 levels.

Which of the following should your first management step?

- 1- 15 mg methotrexate
- 2- 80 mg methylprednisolone
- 3- 400 mg hydroxychloroquine
- 4- 500 mg naproxen BD
- 5- Stop minocycline

Answer & Comments

Answer: 5- Stop minocycline

Learning points:

Presentation of drug-induced lupus

Common drug culprits

Autoantibody profile

Management of drug-induced lupus.

Drug-induced lupus can occur in susceptible patients or those with underlying lupus, secondary to drugs which induce the development of ANA antibodies.

It usually occurs in the sixth decade (except in young patients being treated for acne with minocycline).

Common drug culprits are

Procainamide

Hydralazine

Isoniazid and

Anti-TNF medications (infliximab and etanercept).

In contrast to idiopathic systemic lupus erythematosus (SLE), it is almost never seen in Afro-Caribbeans.

Antihistone antibodies are present in 90% of cases (cf. idiopathic SLE 80%).

In contrast to idiopathic SLE, anti-Smith and anti-ds DNA antibodies are rare, complement levels are normal and there is a M:F ratio of 1:1.

Resolution of symptoms usually occurs within one to seven months of withdrawing the offending drug.



[Q: 3276] OnExamination 2012 - Rheumatology

A 42-year-old lady presents with fatigue and tiredness.

Recently, she has noted that her eyes feel dry and gritty, and she requires water to swallow her food. On examination, there is salivary gland enlargement in her neck.

Recent blood tests are:

Hb 12.1g/dl(11.5 - 16.5 g/dL)

WBC $7.8 \times 10^9/L$ (4 - $11 \times 10^9/L$)

Neutrophils 70%(40-75%)

Platelet $270 \times 10^9/L$ (150 - $400 \times 10^9/L$)

ESR 36 mm/hr (0 - 20 mm/1st hr)

Anti-nuclear antibody positive (1:80)
(Negative at 1:20 Dil)

Anti-centromere antibody negative (Negative at 1:40 Dil)

Anti-Scl70 antibody negative (Negative)

Anti-U1RNP negative (Negative)

Anti-Ro/La antibody positive (Negative)

Urea, electrolytes and creatinine normal

What is the diagnosis?

- 1- Discoid lupus erythematosus
- 2- Mixed connective tissue disease
- 3- Sjogren's syndrome
- 4- Systemic lupus erythematosus
- 5- Systemic sclerosis

Answer & Comments

Answer: 3- Sjogren's syndrome

This patient has Sjogren's syndrome.

Other causes of dry eyes, and/or dry mouth include

Past head and neck radiation

Hepatitis C infection

Acquired immunodeficiency disease

Pre-existing lymphoma

Sarcoidosis

Graft versus host disease or

The use of an anticholinergic drugs.

Patients are at a higher risk of developing lymphoma (non-Hodgkin's lymphoma [NHL] B cell), and should be monitored for this.



[Q: 3277] OnExamination 2012 - Rheumatology

A 29-year-old lady presents with recurrent troublesome acne, episodes of palmo-plantar pustules, and painful swelling of the acromioclavicular joint.

Recent blood tests are:

Hb 12.1g/dl(11.5 - 16.5 g/L)

WBC $7.8 \times 10^9/L$ (4 - $11 \times 10^9/L$)

Neutrophils 70%(40-75%)

Platelet $270 \times 10^9/L$ (150 - $400 \times 10^9/L$)

ESR 36 mm/hr(0 - 20 mm/1st hr)

Bilirubin 17 $\mu\text{mol/L}$ (1 - 22 $\mu\text{mol/L}$)

ALT 34 IU/L(5 - 35 U/L)

AST 36 IU/L(1 - 31 U/L)

Alkaline phosphatase 215 U/L(45 - 105 U/L (over 14 years)

Urea, electrolytes and creatinine Normal

What is the diagnosis?

- 1- Multicentric reticulohistiocytosis
- 2- Osteomyelitis
- 3- Reactive arthritis
- 4- Reiter's syndrome
- 5- SAPHO syndrome

Answer & Comments

Answer: 5- SAPHO syndrome

This patient has SAPHO syndrome. SAPHO is an acronym for synovitis, acne, pustulosis, hyperostosis, and osteitis. It is characterised by osteosclerotic bone lesions, sterile osteomyelitis, and a variety of skin lesions.

Synovitis - may be present rarely, and associates with erosions.

Acne - may be severe (conglobate or fulminans) and recur with new bony involvement.

Pustulosis - palmo-plantar pustulosis occurs in approximately 50% of patients, other skin lesions may include psoriasis, hidradenitis suppurativa, acne, and rarely Sweet's syndrome.

Hyperostosis (increase in bone substance) and osteitis (inflammation of the bones) - the bony lesions typically involve the acromioclavicular, and sternoclavicular joints. Other sites include anterior chest wall, sternum, clavicle, pubic symphysis, spine, and mandible. These lesions are visualised on 99m technetium bone scan or MRI.

The cause of the SAPHO syndrome is unknown. The skin lesions are characterised by neutrophilic pseudoabscesses. Bone biopsy can reveal sterile osteomyelitis.

Diagnosis should be suspected when there is an association of rheumatic pain with a pustular skin disease.

SAPHO has no specific treatment, and some cases remit spontaneously. Typical treatment can be used for the arthritic symptoms (i.e. non-steroidal anti-inflammatories and disease modifying anti-rheumatic agents). Isotretinoin and aciretin can be used to treat the skin disease. In the more severe cases corticosteroids, calcitonin, bisphosphonates and TNF-inhibitors can be used.



[Q: 3278] OnExamination 2012 - Rheumatology

A 30-year-old architect presents with a three month history of low back pain, and stiffness. This is worse in the morning and improves with activity.

There are no other symptoms. There is no significant past or family history. He has tried over the counter ibuprofen (400 mg up to three times a day), which led to a significant improvement in his symptoms.

A lumbar spine and pelvic radiograph done by his GP is reported as normal. Blood tests show a normal FBC, UEC and liver function tests. The CRP is 23 mg/L and the ESR is 32 mm/hr.

What is the most likely diagnosis?

- 1- Ankylosing spondylitis
- 2- Discitis
- 3- Mechanical back pain
- 4- Osteoarthritis
- 5- Spondylolisthesis

Answer & Comments

Answer: 1- Ankylosing spondylitis

The combination of lower back pain and stiffness makes ankylosing spondylitis (AS) the most likely diagnosis in this scenario.

Ankylosing spondylitis is a chronic, potentially disabling, form of seronegative spondyloarthropathy which primarily involves the axial skeleton. The aetiology is not clearly understood, but it involves the interaction of genetic and environmental factors. The pathology mainly affects the entheses, where ligaments, tendons and capsules are attached to the bone.

Current British Society for Rheumatology recommendations state that the modified New York criteria should be used to diagnose ankylosing spondylitis:

Clinical criteria

Low back pain, present for more than three months, improved by exercise but not relieved by rest

Limitation of lumbar spine motion in both the sagittal and frontal planes

Limitation of chest expansion relative to normal values for age and sex

Radiological criteria

Sacroiliitis on x ray

Diagnose

Definite AS if the radiological criterion is present plus at least one clinical criterion

Probable AS if three clinical criteria are present alone or if the radiological criterion is present but no clinical criteria are present.

It is widely accepted that making the diagnosis early is difficult because the onset is insidious, and there is no definitive diagnostic test. One study has stated that the average time from onset to diagnosis ranges from three to 11 years. Timely diagnosis therefore requires a high index of suspicion.

HLA-B27 is found in 90% patients with AS but also 8% of the general population and therefore should not be relied upon in making a diagnosis.

MRI can visualise sacroiliitis in patients with typical symptoms of AS but normal radiographs and it is evolving as the most important diagnostic imaging tool in early disease.

However, as yet a diagnosis of ankylosing spondylitis cannot be made on MRI findings alone and these cases are currently termed non-radiographic axial spondyloarthritis (SpA).

Both HLA-B27 and sacroiliitis on MRI play a major role in the recently proposed Assessment of SpondyloArthritis International

Society (ASAS) diagnostic algorithm. This may replace the modified New York criteria in the future.

An x ray of the lumbar spine may show bridging syndesmophytes between the vertebral bodies in keeping with ankylosing spondylitis but this is not part of the diagnostic criteria, and it is a late sign.

Radiographic sacroiliitis is a requirement for patients to be eligible for anti-TNF treatment for AS. The sacroiliitis is usually bilateral and symmetrical. It progresses from blurring of the subchondral bone plate to irregular erosions of the margins of the sacroiliac joints to sclerosis, narrowing, and finally fusion.

Erosions of the sacroiliac joint are generally seen earlier in the lower portion due to its synovial lining, and on the iliac side due to the thinner cartilage covering this side of the joint.

Discitis is inflammation of the vertebral disc space, often related to infection. It typically presents with an insidious onset of pain and localised tenderness, which is worsens with activity (unlike the stiffness described here).

Mechanical back pain and osteoarthritis pain also improve with NSAIDs. However, they cause low back pain that is worse with activity, and relieved with rest.

Spondylolisthesis is the movement of one vertebra due to instability. It presents with pain which is worse with activity, and may be associated with nerve root compression.



[Q: 3279] OnExamination 2012 - Rheumatology

A 45-year-old man presents with a six month history of gradually worsening right knee pain, swelling, and restricted movements. There is no history of injury, or recent infections. He does not take any long term medications, and there is no significant past or family history of note.

On examination, the knee is grossly swollen, warm, non-tender, and there is restricted flexion and extension. The synovial fluid aspirated is brown stained.

What is the diagnosis?

- 1- Acute CPP crystal arthritis (pseudogout)
- 2- Gout
- 3- Meniscal tear
- 4- Pigmented villonodular synovitis
- 5- Reactive arthritis

Answer & Comments

Answer: 4- Pigmented villonodular synovitis

Haemophilia

Haemosiderosis from recurrent haemarthrosis

Haemochromatosis and

Pigmented villonodular synovitis (PVNS)

are differential diagnoses of arthropathies associated with iron deposition in the joints. Iron deposition causes a brown stained synovial fluid.

They can therefore lead to brown-stained synovial fluid.

Calcium pyrophosphate crystal arthritis (pseudogout), typically occurs in elderly patients who have a history of osteoarthritis. It presents with acute onset of joint swelling and pain.

This patient also has no risk factors for gout (young age, no history of excessive alcohol intake), meniscal tears (no injury), or reactive arthritis (no preceding infections).

PVNS is a rare proliferative disorder that affects the synovium in young and middle aged adults. Current thinking is that it is an inflammatory process, although some believe it is a benign neoplasm.

Monoarticular involvement, the most common manifestation, occurs in two forms: localised and diffuse. The localised form is characterised by focal synovial involvement, with either nodular or pedunculated masses. The diffuse form, in contrast, affects virtually the entire synovium. Although any joint can be involved, the knee is the most common.

Symptoms are usually non-specific (pain, warmth, swelling). On examination there is tenderness, effusion and restricted joint mobility. Radiographs are often unremarkable, but MRI can show intra-articular masses with signal dropout on T2 weighted images. Joint aspiration yields xanthochromic or serosanguineous fluid.

The optimal treatment of PVNS is surgery. The local recurrence after marginal excision for localised disease is low. However, recurrence after open synovectomy for diffuse PVNS is relatively high (up to 46%, higher with arthroscopic resection). Synovectomy, in addition to disease control, can prevent secondary osteoarthritis. Complications include arthrofibrosis and wound breakdown.

Intra-articular radioactive isotopes or external beam radiotherapy may be beneficial adjunct therapy for extensive diffuse and recurrent PVNS.

In some patients total joint arthroscopy may be the only effective treatment.

PVNS can be aggressive, with marked extra-articular extension.



[Q: 3280] OnExamination 2012 - Rheumatology

A 67-year-old man with Wegener's granulomatosis, previously treated with cyclophosphamide, is currently on azathioprine.

His vasculitis is well controlled. He was found to have microscopic haematuria on two

occasions a month apart. Urine culture showed no growth. There is no proteinuria, abdominal pain, and a renal ultrasound is normal.

He has normal inflammatory markers and stable urea electrolytes and creatinine over the last year.

What is the next step in his management?

- 1- Cystoscopy
- 2- Prolonged urinary culture
- 3- Renal angiogram
- 4- Renal biopsy
- 5- Urine culture for TB

Answer & Comments

Answer: 1- Cystoscopy

Cyclophosphamide causes haemorrhagic cystitis, and increases the risk of developing bladder cancer in the future. The risk increases with increasing doses of cyclophosphamide.

Renal biopsy is not indicated as there is no evidence of active renal vasculitis - normal inflammatory markers, stable creatinine.

Renal angiogram is used to investigate renal artery stenosis.

Renal tract TB is unlikely in the absence of proteinuria.



[Q: 3281] OnExamination 2012 - Rheumatology

A 50-year-old man presented with a six week history of general malaise and a two day history of a right foot drop, a left ulnar nerve palsy and a widespread purpuric rash.

He complained of arthralgia but had no clinical evidence of inflammatory joint disease.

Investigations revealed:

ESR 100 mm/hr (0-20)

ANCA Negative

ANA Negative

Rheumatoid factor Strongly positive

C₃ 0.8 g/L (0.75-1.6)

C₄ 0.02 g/L (0.14-0.5)

Urine dipstick blood ++, No protein

An echocardiogram was normal and two sets of blood cultures were negative.

What is the most likely diagnosis?

- 1- ANA negative SLE
- 2- Cryoglobulinaemia
- 3- Infective endocarditis
- 4- Polyarteritis nodosa
- 5- Rheumatoid arthritis

Answer & Comments

Answer: 2- Cryoglobulinaemia

The history is strongly suggestive of systemic vasculitis with mononeuritis multiplex, purpuric rash and haematuria.

It is important to exclude conditions which can mimic vasculitis such as infective endocarditis. The normal echocardiogram and negative blood cultures make this unlikely.

Whilst polyarteritis nodosa can present with exactly this clinical picture, the marked consumption of C₄ together with a strongly positive rheumatoid factor strongly suggests cryoglobulinaemia as the underlying cause.

Cryoglobulins are immunoglobulins which precipitate in the cold. They can be

Type I (monoclonal)

Type II (mixed monoclonal and polyclonal) or

Type III (polyclonal).

Type I cryoglobulinaemia is associated with haematological diseases such as myeloma and Waldenstrom's.

Type II and type III cryoglobulinaemia can be associated with many connective tissue disorders, chronic infections and most importantly, hepatitis C infection which should always be excluded.

Treatment of cryoglobulinaemia would include plasmapheresis, high dose steroids and cyclophosphamide.



[Q: 3282] OnExamination 2012 - Rheumatology

A 50-year-old man with insulin dependent diabetes presents with a two week history of an acutely painful, erythematous, swollen left mid-foot for the last two weeks. He does not drink alcohol, and has had no recent injuries to the foot.

On examination, the mid-foot is warm. Pedal pulses are intact. There is sensory loss in a glove and stocking distribution bilaterally. Recent blood tests show a normal FBC, CRP, urea and electrolytes and creatinine.

What is the most likely diagnosis?

- 1- Cellulitis
- 2- Charcot joint
- 3- Deep venous thrombosis
- 4- Fragility fracture
- 5- Gout

Answer & Comments

Answer: 2- Charcot joint

In patients with longstanding diabetes and peripheral neuropathy, a red hot swollen foot should raise suspicion of Charcot neuroarthropathy.

Charcot neuropathy presents as a warm, swollen, erythematous foot and ankle, and infection is important to exclude. The majority of patients are in their 50-60s, and they often present in the latter stages of the disease.

It can occur in association with a variety of conditions, including leprosy, poliomyelitis, rheumatoid arthritis, although today the most common cause is diabetes mellitus.

The pathophysiology of Charcot neuroarthropathy is not completely understood, but is thought to start with peripheral neuropathy. The lack of pain sensation may mean that patients subject the foot joints (commonly the midfoot) to stress injuries that lead to the Charcot process. It is important to note however that about half of patients present with pain.

Four stages of Charcot neuropathy are recognised:

Stage 0 (inflammation): characterised by erythema and oedema, but no structural changes

Stage 1 (development): bone resorption, fragmentation and joint dislocation. Swelling, warmth and erythema persist but there are also radiographic changes such as debris formation at the articular margins, osseous fragmentation and joint disruption

Stage 2 (coalescence): bony consolidation, osteosclerosis and fusion are all seen on plain radiographs

Stage 3 (reconstruction): osteogenesis, decreased osteosclerosis, progressive fusion. Healing and new bone formation occur, and the deformity becomes permanent.

Radiographs are an important part of investigating a patient with possible Charcot arthropathy. All radiographs should be taken in the weight-bearing position.

MRI can demonstrate changes in the earlier stages of the condition, and is therefore important in allowing treatment to be instigated earlier.

In stages 0 and 1 the treatment is immediate immobilisation and avoidance of weight-bearing. A total-contact cast is worn until the

redness, swelling and heat subside (generally 8-12 weeks, changed every 1-2 weeks to minimise skin damage). After this the patient should use a removable brace for a total of four to six months.

Bisphosphonates can be used, but evidence of clinical benefit is lacking. Surgery is reserved for severe deformities that are susceptible to ulceration, and where braces and orthotic devices are difficult to use.

A normal FBC and CRP in this case make cellulitis unlikely. There is no swelling of the calf to suggest a deep vein thrombosis.

Fragility fractures are those which are caused by a force equivalent to a fall from the height of a chair or less. They are typically seen on a background of osteoporosis and there is usually a history of trauma.

Gout classically causes an acute monoarthritis and the presentation is typically more acute than described here.



[Q: 3283] OnExamination 2012 - Rheumatology

A 36-year-old woman presents with an acutely painful red eye and painful lumpy red-blue lesions on her shin.

On enquiry she gives a history of recurrent episodes of oral and genital ulcers in the last year. Some of these ulcers have been scarring.

Recent blood tests show a normocytic normochromic anaemia, normal LFTs, UE&C, and a raised ESR of 56 mm/hr.

What is the diagnosis?

- 1- Behcet's disease
- 2- Reactive arthritis
- 3- Sarcoidosis
- 4- Stevens-Johnson syndrome
- 5- Systemic lupus erythematosus

Answer & Comments

Answer: 1- Behcet's disease

This patient has Behcet's disease. This is a clinical diagnosis. Recurrent scarring oro-genital ulcers are pathognomonic of Behcet's disease. Recurrent oral ulcers occur in SLE but they are generally non-scarring.

Reactive arthritis and sarcoidosis do not associate with recurrent scarring oro-genital ulcers.

Uveitis does not occur in Steven-Johnson's syndrome.

The International Study Group criteria for classification of Behcet's disease require the presence of recurrent oral ulceration (minor aphthous, major aphthous or herpetiform ulceration observed by physician or patient, which have recurred at least three times in a 12 month period), and two of the following:

Recurrent genital ulceration: aphthous ulceration or scarring, observed by physician or patient

Eye lesions: anterior uveitis, posterior uveitis, or cells in vitreous on slit lamp examination; or retinal vasculitis observed by ophthalmologist

Skin lesions: erythema nodosum observed by physician or patient, pseudofolliculitis or papulopustular lesions; or acneiform nodules observed by the physician in post-adolescent patients not on corticosteroid treatment

Positive pathergy test: read by physician at 24-48 hours.

Pathergy is the non-specific hyperreactivity of the skin following minor trauma, and is specific to Behcet's disease. It involves intradermal injection of skin with a 20-gauge needle under sterile conditions. It is considered positive if an erythematous sterile papule develops within 48 hours.



[Q: 3284] OnExamination 2012 -
Rheumatology

A 75-year-old woman presents with a three week history of new-onset headache.

She had an episode of transient visual loss one week ago but ocular examination is now normal. She reports that when she chews food, she gets aching in her jaw.

Blood tests reveal:

C reactive protein 90 mg/L (< 10 mg/L)

Erythrocyte sedimentation rate 120 mm/hour
(0 - 30 mm/1st hr)

Haemoglobin 9.5 g/dL (11.5 - 16.5 g/dL)

Platelet $528 \times 10^9/L$. 150 - $400 \times 10^9/L$

What treatment needs be given that day?

Select the single best answer.

- 1- Aspirin 300 mg by mouth
- 2- Nothing
- 3- Methylprednisolone 500 mg IV
- 4- Prednisolone 40 mg by mouth
- 5- Prednisolone 60 mg by mouth

Answer & Comments

Answer: 3- Methylprednisolone 500 mg IV

These symptoms and investigation findings are typical of giant cell arteritis (GCA).

GCA affects large and medium sized arteries, with a predilection for the external carotid, ciliary and retinal arteries. Endovascular damage and cytokine-mediated inflammation causes local ischaemia. There is considerable overlap with polymyalgia rheumatica, and symptoms of both should be sought. 20% of patients develop loss of vision, which can be prevented with timely recognition and treatment. Visual loss typically occurs early in the course of disease and, once established, rarely improves. The classically described jaw claudication occurs in a minority of cases, but

does indicate a high risk of ischaemic complications.

The typical presentation of GCA is a temporal headache, with myalgia, malaise and fever. ESR and CRP are usually raised.

As soon as the diagnosis is suspected, high dose corticosteroids should be given. Current BSR guidelines recommend:

- Uncomplicated GCA (no jaw or tongue claudication, or visual symptoms): prednisolone 40-60mg daily
- Complicated GCA:
 - Evolving visual loss or history of amaurosis fugax: IV methylprednisolone 500mg-1g daily for three days, followed by oral corticosteroids
 - Established visual loss: at least 60mg prednisolone daily

Bone protection and proton-pump inhibitors should be co-prescribed.

It is important to note that the pathological findings of giant cell arteritis persist for one to two weeks following initiation of corticosteroid, and therefore treatment should not be delayed to obtain a biopsy.

Aspirin 75mg once daily is sometimes given as an adjunct but higher doses are not recommended.

Symptoms usually resolve quickly, often with two or three days. Once they and laboratory abnormalities resolve, the dose of corticosteroid can be reduced and usually stopped within two years. The patient should be monitored for recurrence throughout the taper: ESR every 4 weeks for 2-3 months, then every 8-12 weeks until 12-18m after cessation of therapy.

Giant cell arteritis is a medical emergency and should be treated without delay. It is not acceptable to give no treatment.



[Q: 3285] OnExamination 2012 -
Rheumatology

A 30-year-old man is referred to the outpatient clinic complaining of persistent low back pain associated with prolonged morning stiffness. His father has a long history of back problems.

Which is the best option to confirm a diagnosis of ankylosing spondylitis?

- 1- Blood test for HLA-B27
- 2- Clinical examination showing reduced mobility of the spine
- 3- MRI of the sacroiliac joints and spine
- 4- x Ray of the lumbar spine
- 5- x Ray of the sacroiliac joints

Answer & Comments

Answer: 5- x Ray of the sacroiliac joints

Ankylosing spondylitis (AS) is a chronic, potentially disabling, form of seronegative spondyloarthropathy which primarily involves the axial skeleton. The aetiology is not clearly understood, but it involves the interaction of genetic and environmental factors. The pathology mainly affects the entheses, where ligaments, tendons and capsules are attached to the bone.

Current British Society for Rheumatology recommendations state that the modified New York criteria should be used to diagnose ankylosing spondylitis:

CLINICAL CRITERIA

Low back pain, present for more than 3 months, improved by exercise but not relieved by rest

Limitation of lumbar spine motion in both the sagittal and frontal planes

Limitation of chest expansion relative to normal values for age and sex

RADIOLOGICAL CRITERIA

Sacroiliitis on x ray

DIAGNOSE

Definite AS if the radiological criterion is present plus at least one clinical criterion

Probable AS if three clinical criteria are present alone or if the radiological criterion is present but no clinical criteria are present

It is widely accepted that making the diagnosis early is difficult because the onset is insidious, and there is no definitive diagnostic test. One study has stated that the average time from onset to diagnosis ranges from 3-11 years. Timely diagnosis therefore requires a high index of suspicion.

A. Blood test for HLA-B27:

This is found in 90% patients with AS but also 8% of the general population therefore should not be relied upon in making a diagnosis.

B. Clinical examination showing reduced mobility of the spine:

This should be performed and would likely show reduced range of movement of the spine but alone cannot confirm the diagnosis of ankylosing spondylitis.

C. MRI of the sacroiliac joints and spine:

MRI can visualise sacroiliitis in patients with typical symptoms of AS but normal radiographs, and it is evolving as the most important diagnostic imaging tool in early disease. However, as yet a diagnosis of ankylosing spondylitis cannot be made on MRI findings alone and these cases are currently termed non-radiographic axial spondyloarthritis (SpA). Both HLA-B27 and sacroiliitis on MRI play a major role in the recently proposed Assessment of SpondyloArthritis International Society (ASAS) diagnostic algorithm. This may replace the modified New York criteria in the future.

D. x Ray of the lumbar spine:

An x ray of the lumbar spine may show bridging syndesmophytes between the vertebral bodies in keeping with ankylosing spondylitis but this is not part of the diagnostic criteria, and it is a late sign.

E. x Ray of the sacroiliac joints:

This is the current gold standard for the diagnosis of ankylosing spondylitis as part of the modified New York criteria. Radiographic sacroiliitis is a requirement for patients to be eligible for anti-TNF treatment for AS. The sacroiliitis is usually bilateral and symmetrical. It progresses from blurring of the subchondral bone plate to irregular erosions of the margins of the sacroiliac joints to sclerosis, narrowing, and finally fusion. Erosions of the sacroiliac joint are generally seen earlier in the lower portion due to its synovial lining, and on the iliac side due to the thinner cartilage covering this side of the joint.

Reference:

New approaches to diagnosis and classification of axial and peripheral spondyloarthritis. Rudwaleit M. Curr Opin Rheumatol 2010 Jul;22(4):375-380.



[Q: 3286] OnExamination 2012 - Rheumatology

A 66-year-old man presented to the ophthalmologist with a two day history of sudden loss of vision in his left eye, with which he had awoken.

He also had left jaw claudication and tingling and numbness in his hands with difficulty in performing fine movements for the last 10 days. In addition he has had stiffness in his shoulders and neck with difficulty getting up from a chair for a few weeks. He has lost a stone in six weeks and has had night sweats. He has not travelled recently.

He is a non-smoker and does not drink alcohol. His past medical history includes late onset asthma, recurrent sinusitis and allergic rhinitis.

Examination revealed no perception of light in left eye, weak hand grip and power 4/5 in proximal muscles of the lower limbs with normal reflexes and down going plantars. He was pyrexial with a temperature of 38.9°C. Fundoscopy revealed a possible left retinal artery infarct. His temporal arteries were palpable and non-tender.

Full blood count revealed:

WCC 37(4 - 11 x 10⁹/L)

Eosinophils 14(0.04 - 0.4 x 10⁹/L)

Neutrophils 14(1.5 - 7 x 10⁹/L)

Platelets 574(150 - 400 x 10⁹/L)

Hb 12.9(13.0 - 18.0 g/dL)

Plasma viscosity 1.82(1.50 - 1.72 mPa/s)

CRP 211(< 10 mg/L)

CK 802(24 - 195 U/L)

CXR revealed a thickened right middle lobe fissure. CT head demonstrated fluid within the left maxillary sinus, and normal intracranial appearances. His immunology revealed a high titre of P-ANCA with MPO 82, and PR3 2. ANA was negative and immunoglobulins were normal. Total IgE was 233 (normal range 4.2-595U/ml).

Muscle biopsy showed no evidence of myositis.

What is the most probable diagnosis?

- 1- Allergic bronchopulmonary aspergillosis
- 2- Churg-Strauss syndrome
- 3- Giant cell arteritis
- 4- Hypereosinophilic syndrome
- 5- Wegener's granulomatosis

Answer & Comments

Answer: 2- Churg-Strauss syndrome

Churg-Strauss syndrome (CSS) is a rare form of small-vessel vasculitis, characterised by asthma, allergic rhinitis and prominent peripheral blood eosinophilia. Rarely, it can

cause either an anterior or a posterior ischaemic optic neuropathy, which presents with visual loss as is the case here. Whilst the history seems typical of giant cell arteritis the raised eosinophilia count and positive MPO antibodies should lead you to a diagnosis of Churg-Strauss.

The most commonly involved organ is the lung, followed by the skin. CSS, however, can affect any organ system, including the cardiovascular, gastrointestinal, renal, and central nervous systems. The unifying feature of patients presenting with CSS is asthma. Vasculitis involving the peripheral nervous system is also a characteristic feature, and mononeuritis multiplex occurs in 75% of patients.

Vasculitis of extrapulmonary organs is largely responsible for the morbidity and mortality associated with CSS. Forty to 60% are associated with positive ANCA, usually pANCA/MPO.

Intravenous glucocorticoid is used for initial therapy of acute multi-organ disease, followed by oral glucocorticoid therapy, often with azathioprine as a steroid-sparing agent..

Loss of vision must be treated aggressively.

Allergic bronchopulmonary aspergillosis is a hypersensitivity reaction to *Aspergillus*. Its clinical presentation varies from corticosteroid-dependent asthma to diffuse bronchiectasis with fibrosis. Visual loss is not an associated feature.

Wegener's granulomatosis is a multi-organ autoimmune disease, which can be fatal. The classical triad consists of necrotising granulomatous inflammation of the respiratory tract, glomerulonephritis and a small-vessel vasculitis. A prolonged history of epistaxis or sinusitis is commonly found in Wegener's granulomatosis, which in some patients is also associated with an eosinophilia.

Hypereosinophilic syndrome is characterised by a peripheral blood eosinophil count of >1.5 for more than six months. Generalised symptoms are fatigue, myalgia, fever, night sweats, diarrhoea and pruritis. Other symptoms depend on the organ involved: cardiac disease causes chest pain and dyspnoea, respiratory disease presents with a dry cough.

Reference:

Churg-Strauss syndrome presenting with visual loss. Carmichael J et al. Rheumatology 2000;39(12):1433-1434



[Q: 3287] OnExamination 2012 - Rheumatology

June, a 45-year-old woman has had arthritis for 16 weeks. She has morning stiffness lasting two hours. The hands, wrists, right elbow and knees are swollen. She also complains of painful feet.

The ESR is 41 mm/hr and C reactive protein is 34 mg/L. The full blood count is normal.

Which antibody test would you request if you suspected that she had early rheumatoid arthritis?

- 1- Antinuclear antibodies (ANA)
- 2- Anticyclic citrullinated peptide antibodies (anti-CCP antibodies)
- 3- Antiphospholipid antibodies
- 4- Complement
- 5- Antineutrophil cytoplasmic antibodies (ANCA)

Answer & Comments

Answer: 2- Anticyclic citrullinated peptide antibodies (anti-CCP antibodies)

A. High titres of ANA are associated with a large number of autoimmune diseases, most commonly systemic lupus erythematosus (SLE).

B. Anti-CCP antibodies are highly specific and sensitive for rheumatoid arthritis and their titre correlates with erosive disease.

Anticyclic citrullinated peptide antibodies should be used as one of the first line immunological investigations in suspected rheumatoid arthritis.

C. Antiphospholipid antibodies would be requested when the clinical presentation suggests a diagnosis of antiphospholipid syndrome.

D. Complement is not an antibody test. Levels are generally performed in specific cases, for example, cryoglobulinaemia and SLE.

E. Antineutrophil cytoplasmic antibodies (ANCA) are more commonly associated with vasculitides which the history does not suggest in this case.



[Q: 3288] OnExamination 2012 - Rheumatology

A 25-year-old female was started on minocycline for the treatment of acne.

Seven days later she presented with fever, myalgia, arthralgia and a fixed erythematous rash over the malar eminences that spared the nasolabial folds.

Which autoantibody test would confirm the diagnosis?

- 1- Anti ds-DNA
- 2- Antihistone
- 3- Anti-Jo-1
- 4- Anti-RNP
- 5- Anti-SCI70

Answer & Comments

Answer: 2- Antihistone

This patient has developed drug-induced lupus as a result of minocycline therapy.

This is a syndrome of positive antinuclear antibody (ANA) that appears during therapy with medications and biologic agents.

It

Has a less female predilection than systemic lupus erythematosus (SLE)

Rarely involves central nervous system (CNS) and kidneys

Is rarely associated with anti-ds-DNA

Is commonly (almost 100%) associated with antibodies to antihistones,

hence, option B is the correct answer.

It usually resolves over several weeks after discontinuation of the offending medication.

About 50 drugs have been listed. The important ones are penicillamine, procainamide, phenytoin, carbamazepine, isoniazid, minocycline, ACE inhibitors, beta blockers, hydralazine, propylthiouracil, hydrochlorthiazide, interferons and TNF inhibitors.

Reasons for the other options being incorrect:

Anti ds-DNA - Almost exclusive for SLE but rarely positive in drug-induced lupus

Anti Jo-1 - Associated with acute onset of poly/dermatomyositis

Anti RNP - Present in syndromes that have overlap features of several rheumatic syndromes

Anti SCI-70 - Associated with 40% cases of diffuse systemic sclerosis.



[Q: 3289] OnExamination 2012 - Rheumatology

A 40-year old lady presents to clinic complaining of an 18 month history of dorsoradial wrist pain. She is a keen tennis player.

On examination she has tenderness localised to the dorsoradial aspect of the wrist and passive motion of the thumb causes crepitus in the same region. Finkelstein's test is positive.

Which of the following is the likely diagnosis?

- 1- Carpal tunnel syndrome
- 2- De Quervain's tenosynovitis
- 3- Golfer's elbow
- 4- Tennis elbow
- 5- Ulnar tunnel syndrome

Answer & Comments

Answer: 2- De Quervain's tenosynovitis

De Quervain's tenosynovitis is thought to be related to overuse, and is common in golfers and racquet sport players.

Most affected are females 30-50 years old.

Finkelstein's test (flexion of the thumb into the palm, making a fist over the thumb and ulnar deviation of the wrist causes pain in the first dorsal extensor compartment) is diagnostic.



[Q: 3290] OnExamination 2012 - Rheumatology

A 60-year-old lady develops a fracture of the wrist following a fall; dual energy x ray absorptiometry (DEXA) scan reveals osteoporosis in lumbar spine and hip.

She has been commenced on once weekly alendronate 70 mg weekly and also takes a Calcichew tablet.

By what mechanism does the bisphosphonate function in the treatment of osteoporosis?

- 1- Enhancing the absorption and action of vitamin D
- 2- Enhancing the absorption of calcium from the gut

- 3- Enhancing the survival and function of osteoblasts
- 4- Enhancing the survival and function of osteoclasts
- 5- Reducing the survival and function of osteoclasts

Answer & Comments

Answer: 5- Reducing the survival and function of osteoclasts

The mechanism of action of bisphosphonates involves the inhibition of farnesyl diphosphate synthase within osteoclasts. In doing this they interfere with geranylgeranylation (attachment of the lipid to regulatory proteins), which causes osteoclast inactivation. This leads to reduced bone turnover, increased bone mass and improved mineralisation.

Bisphosphonates licensed for the prevention and treatment of osteoporosis include alendronate, risedronate and ibandronate.

The bisphosphonates zoledronate and pamidronate are used for the treatment of metastatic bone disease and short term management of hypercalcaemia.



[Q: 3291] OnExamination 2012 - Rheumatology

A 75-year-old female presents with hyperosmolar non-ketotic hyperglycaemia. She has a red, hot and swollen knee.

Which of the following is most useful in the diagnosis of the swollen knee joint?

- 1- ANA
- 2- CRP
- 3- Joint aspiration
- 4- Orthopaedic referral for joint washout
- 5- Rheumatoid factor

Answer & Comments

Answer: 3- Joint aspiration

Joint aspiration is the best option in this context. It is a simple procedure with a high diagnostic yield. A destructive septic arthritis is a potential diagnosis and it must be excluded as a matter of urgency. Joint aspirate is the most crucial step in excluding a septic arthritis, and allows the timely commencement of surgical management and appropriate antibiotics.

Sending the joint aspiration for M/C/S in a blood culture bottle may increase yield. Whilst joint washout is appropriate management of septic arthritis, a diagnosis must be made prior to this being considered.

The risk of introducing infection into the knee joint during simple aspiration by non-experts is 1 in 10,000 procedures, so the procedure is safe.



[Q: 3292] OnExamination 2012 - Rheumatology

A 62-year-old lady is followed up with a one year history of ultrasound positive, bilateral carpal tunnel syndrome. It is refractory to previous physiotherapy and two subcutaneous injections.

Her past medical history includes multiple myeloma. Her BMI is 33 kg/m².

You refer her for a carpal tunnel release and request that a biopsy sample is taken to refute amyloidosis.

Which of the following is a pathological feature of amyloidosis?

- 1- Congo red histological staining - negative birefringence
- 2- Crystallisation in water and buffers of low ionic strength
- 3- Electron micrography - fibrillar appearance
- 4- Haematoxylin and eosin staining - amorphous granulomatous appearance

- 5- x Ray diffraction pattern - alpha helical structure

Answer & Comments

Answer: 3- Electron micrography - fibrillar appearance

Learning points:

Define and recognise histological and radiological properties of amyloid

Understand the basic nomenclature of amyloidosis

Common clinical association of AL amyloid.

Amyloidosis, as a clinic-pathological descriptor is used to denote the in vivo, extracellular deposition of material (amyloid) characterised by the following properties:

Electron micrography - fibrillar appearance

x Ray diffraction pattern - beta pleated sheet structure

Haematoxylin and eosin staining - amorphous eosinophilic appearance

Congo red histological staining - apple-green birefringence

Solubility in water and buffers of low ionic strength.

All types of amyloid consist of an insoluble major fibrillar protein (more than 27 unrelated proteins in humans) that defines the type of amyloid.

This patient has probably developed AL (light chain; formerly primary amyloidosis) amyloid in association with her underlying multiple myeloma, where the precursor protein is a clonal immunoglobulin light chain or light chain fragment.



[Q: 3293] OnExamination 2012 - Rheumatology

A 24-year-old male has been receiving

sulfasalazine at a stable dose for six months as treatment for Reiter's disease. His most recent series of blood tests were normal.

When should he next be screened?

- 1- Two weeks
- 2- One month
- 3- Three months
- 4- Six months
- 5- One year

Answer & Comments

Answer: 3- Three months

Current United Kingdom guidance suggests that during the first three months of treatment with sulfasalazine, full blood count (FBC) should be monitored monthly for the first three months.

If

The white cell count is less than 3.5

Neutrophils less than 2 or

Platelets less than 150

sulfasalazine should be withheld until discussion with the specialist team.

If mean corpuscular volume (MCV) is more than 105 fl, Vitamin B₁₂, folate and thyroid-stimulating hormone (TSH) should be checked and treated if found to be abnormal. If these are all normal it should be discussed with the specialist team.

If counts remain normal within the first three months, full blood count can be checked three monthly.

Liver function tests (LFTs) should also be checked monthly for the first three months. If either the aspartate aminotransferase (AST) or alanine aminotransferase (ALT) are more than twice the upper limit of normal sulfasalazine should be withheld until discussion with the specialist team. If the LFTs

remain normal for the first three months, monitoring can be decreased to three monthly.

If, following the first year, the dose has not been increased and blood results have been stable, the frequency of monitoring can be reduced to every six months for the second year of treatment. Thereafter monitoring is not required, although FBC and LFTs should be checked one month after any dose increase.

Side effects of sulfasalazine include myelosuppression, macrocytosis, hypersensitivity and azoospermia in males.

There are numerous signs of sulfasalazine toxicity. Rash and oral ulceration should be asked about and, if severe, the drug should be withheld until specialist advice has been sought. Nausea, dizziness and headache can be common and sometimes necessitate dose reduction. If patients present with abnormal bruising or sore throat an urgent FBC should be done, and sulfasalazine withheld until results are available.



[Q: 3294] OnExamination 2012 - Rheumatology

A general practice covers a population of 20,000 patients in the United Kingdom.

How many newly diagnosed patients with rheumatoid arthritis would be expected in this population each year?

- 1- 1000
- 2- 500
- 3- 5
- 4- 100
- 5- 50

Answer & Comments

Answer: 3- 5

The incidence of rheumatoid arthritis is approximately 2.5 per 10,000 per year (1.5 in men and 3.6 in women).

Thus in a practice of 20,000 there would be five patients with newly diagnosed rheumatoid arthritis per year.

Rheumatoid arthritis increases with age and the peak age for both genders is the 70s. The overall occurrence of RA is two to four times greater in women than men.

Reference:

<http://www.nice.org.uk/nicemedia/live/12131/43327/43327.pdf> (published feb 2009)



[Q: 3295] OnExamination 2012 - Rheumatology

A 35-year-old female presents with a six month history of joint pain and stiffness of hands and feet.

Examination reveals a synovitis of the distal interphalangeal joints of the left index finger and the right ring finger together with the right wrist and ankle joints. Her ESR was 35 mm/hr (0-10).

Which one of the following conditions is most likely to exhibit this pattern of joint involvement?

- 1- Osteoarthritis
- 2- Psoriatic arthritis
- 3- Reactive arthritis
- 4- Rheumatoid arthritis
- 5- Systemic lupus erythematosus

Answer & Comments

Answer: 2- Psoriatic arthritis

This woman is most likely to have psoriatic arthritis.

Psoriatic arthritis has been subclassified according to different patterns of arthritis.

The rash typically predates the arthropathy by a number of years, but the opposite can be true. Small plaques should be looked for on the elbows and scalp.

There are five patterns of disease:

Symmetrical polyarthritis ('rheumatoid pattern') - affects wrists, hands, feet and ankles. The distal interphalangeal joints are more commonly affected than the metacarpophalangeal joints, which helps to distinguish it from rheumatoid arthritis

Asymmetrical oligoarticular arthritis: dactylitis

Distal interphalangeal joint disease: typically in men

Arthritis mutilans (rare)

Spondylitic pattern with sacroileitis.

Osteoarthritis in this age group is unlikely.

Rheumatoid arthritis is a symmetrical arthritis typically affecting the metacarpophalangeal joints.

Arthritis does occur in systemic lupus erythematosus, however there are several other clinical features that form part of the diagnostic criteria, none of which are present here.

Reactive arthritis occurs following a gastrointestinal or genitourinary infection. It commonly affects the large joints.



[Q: 3296] OnExamination 2012 - Rheumatology

A 51-year-old female has rheumatoid arthritis.

She states that she is allergic to penicillin and co-trimoxazole.

Therefore, which of the following drugs is contraindicated?

- 1- Azathioprine
- 2- Ciclosporin

- 3- Gold therapy
- 4- Methotrexate
- 5- Sulphasalazine

Answer & Comments

Answer: 5- Sulphasalazine

Both co-trimoxazole and sulphasalazine contain sulphonamide groups and hence an allergy to co-trimoxazole would be a contraindication to the use of sulphasalazine.

Co-trimoxazole is a mixture of trimethoprim and sulfamethoxazole.

Sulphasalazine is a combination of 5-aminosalicylic acid and sulfapyridine. It is commonly used in the treatment of inflammatory bowel disease, and can also be used in rheumatoid and psoriatic arthritis.

Azathioprine is a purine analogue which is commonly used as a steroid-sparing agent.

Ciclosporin is a calcineurin inhibitor, used for the prevention of transplant rejection.

Gold therapy was previously used as a disease modifying agent in rheumatoid arthritis, but this has now been replaced by methotrexate which is a dihydrofolate reductase inhibitor.



[Q: 3297] OnExamination 2012 - Rheumatology

A 22-year-old female presents with a six month history of increasing fatigue and arthralgia of the wrists and ankles. More recently, she has also noted a symmetrical rash on her cheeks and some hair loss.

What is the most likely diagnosis?

- 1- Dermatomyositis
- 2- Hypothyroidism
- 3- Porphyria cutanea tarda
- 4- Scleroderma
- 5- Systemic lupus erythematosus (SLE)

Answer & Comments

Answer: 5- Systemic lupus erythematosus (SLE)

This woman has clinical features consistent with systemic lupus erythematosus.

She gives a history of fatigue which occurs commonly in SLE. Arthralgia and arthritis are the most common presenting manifestations of SLE typically affecting the small joints of the hands, wrists and knees. The symmetrical rash is the classical butterfly rash that occurs in a malar distribution. Alopecia is common and may be diffuse or patchy.

In dermatomyositis there is proximal, symmetrical muscle weakness that progresses over weeks to months. The typical lilac papular rash occurs over the dorsum of the metacarpophalangeal (Gottron's papules), eyelids, elbows and knees.

Hypothyroidism does not commonly result in a symmetrical facial rash.

The initial symptoms of scleroderma, now termed systemic sclerosis tend to be non-specific and may consist of fatigue, weakness and musculoskeletal complaints. Raynaud's phenomenon is an early symptom. Skin changes include telangiectasia, hyper- and hypo-pigmentation.

Porphyria cutanea tarda is either primary or secondary uroporphyrinogen decarboxylase deficiency. The commonest symptoms are cutaneous fragility and blistering of sun-exposed skin. There may also be urine discolouration.



[Q: 3298] OnExamination 2012 - Rheumatology

A 31-year-old female presents with red scaly plaques on her cheeks, forehead and sides of the neck.

On close inspection of the lesions there was plugging of some hair follicles with keratin and atrophy of the skin.

What is the most likely diagnosis?

- 1- Atopic eczema
- 2- Discoid lupus erythematosus
- 3- Polymorphic light eruption
- 4- Porphyria cutanea tarda
- 5- Psoriasis

Answer & Comments

Answer: 2- Discoid lupus erythematosus

This woman has discoid lupus erythematosus.

Lesions are discrete plaques, often erythematous, covered by scales that extend into dilated hair follicles. These lesions most typically occur on the face, scalp, in the pinnae, behind the ears and on the neck. They can exist in areas not exposed to the sun.

The lesions can progress, with active indurated erythema at the periphery. Central atrophic scarring is characteristic.

Without treatment, lesions can cause permanent scarring and alopecia. Patients with widespread disease are at increased risk of developing systemic lupus erythematosus and should be closely followed up. Fluocinonide cream, hydrocortisone and acitretin are topical treatment options.

In eczema dryness and lichenification are predominant features.

Psoriasis commonly appears as inflamed lesions covered with a silvery white scale.

Polymorphic light eruption is characterised by recurrent, abnormal, delayed reactions to sunlight, ranging from erythematous papules, papulovesicles, and plaques to erythema multiforme-like lesions on sunlight-exposed surfaces.

Porphyria cutanea tarda is either primary or secondary uroporphyrinogen decarboxylase deficiency. The commonest symptoms are cutaneous fragility and blistering of sun-exposed skin. There may also be urine discolouration.



[Q: 3299] OnExamination 2012 - Rheumatology

A 74-year-old woman with longstanding hypertension and rheumatoid arthritis present with dyspnoea.

On examination she is in atrial fibrillation and is normotensive. The jugular venous pressure (JVP) is elevated. She has bilateral pitting lower limb oedema and ascites. Her echocardiogram shows normal left ventricular systolic function and bi-atrial enlargement.

What is the most likely diagnosis?

- 1- Constrictive pericarditis
- 2- Hypertensive heart disease
- 3- Hypothyroidism
- 4- Lymphatic obstruction
- 5- Pulmonary fibrosis

Answer & Comments

Answer: 1- Constrictive pericarditis

The combination of:

Shortness of breath

Atrial fibrillation

Lower limb oedema

Ascites

Raised JVP

Bi-atrial enlargement with normal systolic ventricular function

is typical of constrictive pericarditis.

Further ECHO examination would reveal peak systolic and diastolic values decreasing with inspiration, and impaired diastolic function.

Constrictive pericarditis is the commonest cardiac complication of rheumatoid arthritis. It is found in 30-50% of patients at postmortem and up to 30% by echocardiography. It is commoner in males and seropositive patients with active joint disease. Histopathology shows chronic inflammation and fibrosis.

Pericardial fluid is usually an exudate with high protein and lactate dehydrogenase and low glucose. Infective pericarditis is an important differential diagnosis, which is also more common in rheumatoid arthritis.

Symptoms are present in only 24% patients and can be non-specific, which often delays the diagnosis. Fewer than 0.5% experience haemodynamic compromise. Presentations include pleuritic chest pain, dyspnoea, oedema and hepatic congestion. Signs are also non-specific and include pericardial rub, tachycardia and quiet heart sounds.

Echocardiography is the investigation of choice, but CT is also useful to confirm pericardial thickening. Cardiac catheterisation is used if pericardectomy is considered.

Pericarditis is usually treated only if it is symptomatic. First line treatment is with non-steroidal anti-inflammatories or steroids. Effusion or constriction is associated with a high mortality, and surgical treatment is associated with better long term outcome if patients can tolerate thoracotomy and pericardial resection.

Hypertension is another cause of diastolic dysfunction, and chronically elevated levels leads to changes in myocardial structure and the conduction system. Left ventricular hypertrophy is typically seen on echocardiography.

Hypothyroidism leads to a decrease in cardiac output and contractility, reduced heart rate and increased peripheral vascular resistance. Symptomatic cardiac disease is rare, and there is no history of thyroid disease in this patient.

Lymphatic obstruction causes lymphoedema, which is most obvious in the limbs.

Pulmonary fibrosis can be associated with rheumatoid arthritis, but would not commonly present with the combination of symptoms described here.



[Q: 3300] OnExamination 2012 - Rheumatology

A 25-year-old female with systemic lupus erythematosus (SLE) attends at 20 weeks into her pregnancy for her routine obstetric appointment.

The fetal heart rate is 50 beats per minute. Fetal echocardiography shows complete heart block.

Which one of the following maternal autoantibodies is likely to be present?

- 1- Anti-dsDNA
- 2- Anti-Jo 1
- 3- Anti-La (SSB)
- 4- Anti-mitochondrial
- 5- Anti-Ro (SSA)

Answer & Comments

Answer: 5- Anti-Ro (SSA)

Anti-Ro antibody is associated with congenital complete heart block (CHB) accounting for the vast majority of cases of CHB.

Anti-mitochondrial antibody is associated with primary biliary cirrhosis.

Anti-dsDNA is associated with SLE rather than specific of HB.

Anti-La is associated with Sjogren's.

Anti-Jo is associated with polymyositis.



[Q: 3301] OnExamination 2012 - Rheumatology

A 52-year-old man with a history of diabetes mellitus presented with hepatomegaly.

Investigations revealed:

Albumin 30 g/L (37-49)

Total bilirubin 22 µmol/L (1-22)

Alkaline Phosphatase 134 U/L (60-110)

ALT90 U/L (5-35)

Gamma-glutamyl transferase 125 U/L (<50)

Ferritin 1450 µg/L (15-300)

Which of the following features would be most suggestive of a diagnosis of haemochromatosis?

- 1- Chondrocalcinosis
- 2- Gynaecomastia
- 3- Migratory polyarthrititis
- 4- Myxoedema
- 5- Rash

Answer & Comments

Answer: 1- Chondrocalcinosis

This man with diabetes has evidence of liver disease with grossly elevated ferritin suggesting a diagnosis of haemochromatosis.

A non-migratory polyarthrititis would be suggestive particularly of the hands, in over 50% of patients there is involvement of the 2nd and 3rd MCPs, and large joints. The most commonly affected joints are MCPs, PIPs, knees, feet, wrists, back and neck.

Skin pigmentation rather than a rash is more typical.

Myxoedema is not a feature of haemochromatosis.

Gynaecomastia is a feature of liver disease/cirrhosis per se and not just haemochromatosis.

However, chondrocalcinosis together with the chronic arthropathy is well recognised in association with haemochromatosis.



[Q: 3302] OnExamination 2012 - Rheumatology

A 70-year-old man from Lancashire has noted increasing back and leg pain for several years.

x Rays reveal bony sclerosis of the sacroiliac, lower vertebral, and upper tibial regions with cortical thickening, but without mass effect or significant bony destruction.

He also says his hat does not fit him anymore. He has difficulty hearing on the left and has orthopnoea and pedal oedema.

Blood tests reveal an elevated serum alkaline phosphatase.

What is the most likely pathologic process that explains these findings?

- 1- Metastatic adenocarcinoma
- 2- Mineral density
- 3- Paget's disease of bone
- 4- Renal failure with renal osteodystrophy
- 5- Vitamin D deficiency

Answer & Comments

Answer: 3- Paget's disease of bone

This man has Paget's disease, with bone pain, cardiac failure and sensorineural deafness.

Paget's disease of bone is a localised disorder of bone remodelling. There are increased numbers of giant osteoclasts, which increase bone resorption with subsequent increase in new bone formation and altered bone architecture.

The structure of the new bone is disorganised and mechanically weaker, and therefore

liable to pathological fracture and deformity. It can affect any bone, but is commonest in the axial skeleton, long bones and skull. The hands and feet are rarely affected. Both genetic and environmental factors are implicated, and it has been suggested paramyxovirus is involved.

The majority of patients affected are over the age of 55, and men are more commonly affected. The UK has the highest prevalence of Paget's disease in the world.

The signs and symptoms of Paget's are varied, depending on the location of involved sites and the degree of increased bone turnover. It is commonly asymptomatic and is discovered by an elevated serum alkaline phosphatase or typical radiographic findings.

When symptoms do occur, the most common are bone pain and/or deformity. Deafness or tinnitus are not uncommon, due to compression of cranial nerve VIII. The most concerning complication is the development of osteosarcoma, which carries a poor prognosis.

Management concentrates on control of pain and the reduction of complications. In addition to analgesia, bisphosphonates are the mainstay of treatment. These reduce bone turnover, improve pain, promote healing of osteolytic lesions and restore normal bone histology. Serial monitoring of alkaline phosphatase can help to monitor treatment.

Decreased bone mineral density is seen in osteoporosis, which is not associated with a rise in alkaline phosphatase.

Bone metastases may be osteolytic, sclerotic or mixed on radiograph, but typically spread to destroy the medullary bone.

Renal osteodystrophy combines features of osteitis fibrosa cystica and osteomalacia, and is typically more focal than described in this scenario.

Vitamin D deficiency leads to osteomalacia, which does not present with the clinical features described above.



[Q: 3303] OnExamination 2012 - Rheumatology

A 37-year-old man presents with fever, dry cough, recurrent episodes of sinusitis, and weight loss for last three weeks. This has failed to respond to oral amoxicillin prescribed by his GP.

On admission, he is noted to have a temperature of 37.0°C, BP 128/70 mm Hg, and pedal oedema. He has blood-stained nasal discharge, and is noted to have a stridor.

Recent blood tests are:

Hb 11.1gm/dl(13.0 - 18.0 g/dL)

WBC $12.8 \times 10^9/L$ (4 - $11 \times 10^9/L$)

Neutrophils 88%(40-75%)

Lymphocytes 10%(20-45%)

Eosinophils 2%(1-6%)

Platelet $470 \times 10^9/\mu l$ (150 - $400 \times 10^9/L$)

ESR 86 mm/hr(0 - 15 mm/1st hr)

CRP 103 mg/L(< 10 mg/L)

Anti-proteinase 3 antibody Positive (Negative anti-nuclear antibody Negative (Negative at 1:20 Dil)

ANCA Positive (cytoplasmic pattern)

Urea, electrolytes & creatinine normal

What is the diagnosis?

1- Anti-GBM syndrome

2- Churg-Strauss syndrome

3- Microscopic polyangiitis

4- Polyarteritis nodosa

5- Wegener's granulomatosis

Answer & Comments

Answer: 5- Wegener's granulomatosis

Common manifestations of Wegener's granulomatosis include:

Constitutional symptoms like fevers, night sweats, fatigue, lethargy, weight loss, arthralgia

Ocular involvement including conjunctivitis, episcleritis, uveitis, optic nerve vasculitis, and proptosis

ENT symptoms like chronic sinusitis, rhinitis, otitis media and hearing loss, subglottic stenosis (leading to stridor and features of extrathoracic airway obstruction on flow-volume loop)

Pulmonary disease, for example, pulmonary infiltrates, cough, haemoptysis, chest discomfort, and dyspnoea

Renal disease manifests as crescentic necrotising glomerulonephritis

Nervous system involvement manifests as mononeuritis multiplex, sensorimotor polyneuropathy, cranial nerve palsies, vasculitis of small to medium-sized vessels of the brain or spinal cord, and granulomatous masses that involve the orbit, optic nerve, meninges or brain

Skin involvement can lead to palpable purpura or skin ulcers.



[Q: 3304] OnExamination 2012 - Rheumatology

Which of the following drugs is most likely to cause drug-induced lupus erythematosus (DILE) syndrome?

- 1- Baclofen
- 2- Isoniazid
- 3- Methotrexate
- 4- Procainamide
- 5- Sulfasalazine

Answer & Comments

Answer: 4- Procainamide

A recessive gene is responsible for the activity of hepatic N-acetyl transferase resulting in slow or fast (intermediate and fast groups get lumped together) acetylation.

Forty five per cent of the United Kingdom population are slow acetylators.

Drugs affected include:

Isoniazid

Hydralazine

Dapsone

Procainamide

Sulfasalazine.

Slow acetylators have increased risk of isoniazid-induced peripheral neuropathy, and hydralazine or procainamide-induced systemic lupus erythematosus (SLE).

At least 38 drugs currently in use can cause DILE. However, most cases have been associated with these three:

Procainamide

Hydralazine

Quinidine.

The risk for developing lupus-like disease from any of the other 35 drugs is low or very low; with some drugs only one or two cases have been reported.

Isoniazid (INH) - low risk.

Sulfasalazine - low risk.



[Q: 3305] OnExamination 2012 - Rheumatology

A 73-year-old male presented with an acute attack of gout in his left knee.

What is the most likely underlying metabolic cause?

- 1- Decreased renal excretion of uric acid
- 2- Endogenous overproduction of uric acid
- 3- Excessive dietary purine intake
- 4- Lactic acidosis
- 5- Starvation

Answer & Comments

Answer: 1- Decreased renal excretion of uric acid

Gout is the most prevalent form of inflammatory arthropathy. It is caused by the deposition of monosodium urate crystals with resultant inflammation in the involved joint. Serum urate concentrations exceeding 7 mg/dl are associated with increased risk of gout.

The aetiology of gout can broadly be divided into cases where there is

Underexcretion of uric acid via the kidney (90%) or

Endogenous overproduction of uric acid (10%)

although in practical terms the distinction is rarely made as allopurinol is the mainstay of long term treatment (not during the acute attack!) in both groups.

Uric acid is the end product of purine metabolism. Its production and excretion are tightly regulated and, in normal circumstances, uric acid excretion is two thirds renal and one third via intestinal bacterial uricolysis. Where renal elimination is impaired, the amount of extra-renal excretion can be increased.

In a 73-year-old man it is almost certainly reduced renal excretion due to deteriorating renal function and possibly diuretic use.

Excessive dietary intake of purines is rarely a cause of sustained hyperuricaemia, although patients should be advised to follow

a low purine diet to reduce the risk of recurrent attacks.

Starvation leads to an increase in lactic acid, which impairs the kidneys' ability to excrete uric acid and therefore increases the risk of developing gout. This is however a rare underlying cause, and decreased renal excretion is more likely in this case.

Gout can also be caused by inborn errors of metabolism which alter uric acid homeostasis. These are mainly inherited enzyme defects, and present in younger patients.

As a final point, it is also important to note that gout appears to be an independent risk factor for cardiovascular mortality and morbidity, additional to the risk conferred by its association with more traditional risk factors.



[Q: 3306] OnExamination 2012 - Rheumatology

A 25-year-old lady gives birth to a baby with complete heart block who subsequently requires pacemaker insertion.

Which of the following antibodies is most likely to be detected in the maternal serum?

- 1- Anti-dsDNA antibodies
- 2- Anti-endothelial antibodies
- 3- Anti-Ro/SSA antibodies
- 4- Anti-SCL70 antibodies
- 5- Rheumatoid factor

Answer & Comments

Answer: 3- Anti-Ro/SSA antibodies

The majority of cases of congenital heart block are due to the presence of anti-Ro/SSA antibodies in the maternal serum.

The mother may have no evidence of a connective tissue disorder.

The risks of congenital heart block in mothers with anti-Ro/SSA antibodies remains very small (<3%) but the correlation between the presence of anti-Ro/SSA antibodies and congenital heart block is very strong.

The heart block is generally permanent (unlike other features of neonatal lupus) and insertion of a permanent pacemaker is frequently required.



[Q: 3307] OnExamination 2012 - Rheumatology

A 64-year-old lady is referred to your connective tissue disease clinic by her GP.

She has been complaining of four months of progressively worsening lower mandibular pain and gum swelling to the premolar region. This was commensurate with a dental extraction for an ipsilateral cavity thought to be the culprit. The residual wound has failed to heal.

Her past medical history includes multiple myeloma, and she takes zoledronic acid once monthly.

A CT scan of her mandible demonstrates disruption to cortical bone, a pathological fracture line and a large region of central bone loss.

What is the pathological process underlying this presentation?

- 1- Actinomyces induced osteonecrosis
- 2- Bisphosphonate induced osteonecrosis of the jaw
- 3- Osteolysis secondary to multiple myeloma
- 4- Osteoradionecrosis secondary to radiation therapy
- 5- Primary (AL) amyloidosis

Answer & Comments

Answer: 2- Bisphosphonate induced osteonecrosis of the jaw

Learning points:

Bone mineral density measurement in postmenopausal women

Indications for bisphosphonate prophylaxis with glucocorticoid therapy

Specific bisphosphonate pharmacotherapy.

The salient features of this case are;

The underlying history of multiple myeloma

Long term use of zoledronic acid

Dental extraction surgery

A non-healing lesion which has persisted for greater than eight weeks despite investigation and radiological evidence of pathological fractures.

Zoledronic acid has been linked to the development of osteonecrosis of the jaw, with a statistically significant association to dental extraction surgery as a precipitant. There is an increased incidence of this complication amongst patients with underlying malignancy, especially multiple myeloma.

A putative role for homozygosity of the T allele polymorphism for cytochrome P450 CYP2C8 conferring a significantly increased likelihood of developing ONJ is still under investigation.



[Q: 3308] OnExamination 2012 - Rheumatology

A 62-year-old man presents with a six month history of a painless lesion to his left subcostal region. The lesion was noticed by his wife and he is asymptomatic.

He has no significant past medical history and takes no regular medication.

The lesion (pictured below) was non tender, dry, indurated and slightly coarse to palpation.

Basic bloods demonstrate;

Hb 12.7g/dL(13-18)

MCV 88fL(80 - 96)

WCC $6.5 \times 10^9/L$ (4 - 11)

Westergren ESR 10/hr(0 - 20)

CRP 5mg/L(<10)

IgM 5.2g/dL(0.05-3.2g/dL)

IgG 2.1g/dL(0.6-1.7g/dL)

ANA - positive, anti-histone - positive, anti-Cu/Zn superoxide dismutase - positive.

What is the diagnosis?

- 1- Diffuse systemic sclerosis
- 2- Discoid lupus erythematosus
- 3- Eosinophilic fasciitis
- 4- Limited systemic sclerosis
- 5- Morphea (localised scleroderma)

Answer & Comments

Answer: 5- Morphea (localised scleroderma)

Learning points:

Clinical appearance of early morphea

Pathophysiology of morphea

Immunological profile of morphea.

This gentleman has developed localised scleroderma, an idiopathic inflammatory skin condition which causes excessive collagen deposition and fibrosis. This patient exhibits the commonest form, 'circumscribed/plaque' morphea.

This is a well defined oval to round plaque that fails to meet the criteria for generalised morphea. The pathogenesis is poorly defined. An autoimmune component is suggested by enhanced T helper 2 (Th2) dependent interleukin 4 (IL-4) activity, which in turn upregulates transforming growth factor beta (TGF- β). TGF- β stimulates fibroblast production of collagen and other extracellular matrix proteins.

Possible serum abnormalities include hypergammaglobulinaemia, peripheral eosinophilia and an elevated erythrocyte sedimentation rate (ESR) and C reactive protein (CRP). Anti-Cu/Zn superoxide dismutase antibodies have been found in up to 90% of some patient samples.



[Q: 3309] OnExamination 2012 - Rheumatology

A 50-year-old man is brought in by ambulance complaining of a two day history of malaise, subjective fever, sweating, nausea, abdominal pains and foul smelling diarrhoea.

He has a past medical history of Crohn's disease, which has been quiescent for three years following the initiation of immunosuppressive therapy. He was commenced on allopurinol three weeks ago, after suffering another flare of his gout.

Clinical examination demonstrated; he is confused, clinically dehydrated, GCS 14, temperature 35.1°C, pulse 101 + regular, BP 95/66 mmHg, normal chest sounds, generalised abdominal tenderness with hyperkinetic bowel sounds.

Blood tests revealed;

Hb 12.0g/dL(13.0 - 18.0)

MCV 90fL(80 - 96)

WCC $1.5 \times 10^9/L$ (4 - 11)

Neutrophils $1 \times 10^9/L$ (1.5 - 7)

Lymphocytes $0.8 \times 10^9/L$ (1.5 - 4)

Platelets $50 \times 10^9/L$ (150 - 400)

Creatinine 150 $\mu\text{mol/L}$ (60 - 110)

Urea 8.9 mmol/L(2.5 - 7.5)

Alanine aminotransferase 50 U/L(5 - 35)

Amylase 70 U/L(60 - 180)

CRP 10 mg/L(<10)

Westergren ESR 25 mm/hr(0 - 20)

Uric acid 200 mmol/L

What is the most likely underlying cause of his presentation?

- 1- Acute pancreatitis
- 2- Allopurinol toxicity
- 3- Azathioprine toxicity
- 4- Calcium pyrophosphate deposition disease (CPPD)
- 5- Crohn's flare

Answer & Comments

Answer: 3- Azathioprine toxicity

Learning points:

Basic mechanism of action and pharmacokinetics of allopurinol

Basic mechanism of action of azathioprine

Potential consequence of their interaction

Second line urate lowering therapy.

This patient has developed bowel sepsis (foul smelling diarrhoea, hypothermic, tachycardic, hypotensive) secondary to pancytopenia induced by the co-administration of allopurinol and azathioprine.

The prodrug azathioprine is metabolised to its active compound 6-mercaptopurine (6-MP). 6-MP undergoes catabolic oxidation to 6-thiouric acid by xanthine oxidase.

Allopurinol has a peak onset of action of one to two weeks and works by inhibiting xanthine oxidase.

Co-administration of these drugs may lead to accumulation of 6-MP and increases the risk of myelosuppression.

A second line urate-lowering agent such as febuxostat would be more appropriate.

A Crohn's flare would not typically cause pancytopenia.

Normal amylase refutes pancreatitis.

Reference:

<http://www.uptodate.com/contents/diagnosis-and-classification-of-osteoarthritis>



[Q: 3310] OnExamination 2012 - Rheumatology

A 30-year-old housewife with SLE had some blood tests.

Results of investigations are as follows:

Hb 12.1g/dl(11.5 - 16.5 g/dL)

WBC $8.9 \times 10^9/L$ (4 - $11 \times 10^9/L$)

Neutrophils 84%(40 - 75%)

Platelet $90 \times 10^9/L$ (150 - $400 \times 10^9/L$)

ESR 14 mm/hr(0 - 20 mm/1st hr)

INR 1.1(<1.4)

aPTT 48 seconds(30 - 40s) did not normalise after addition of normal plasma

Blood film thrombocytopenia, no schistocytes

Urea, electrolytes and creatinine: Normal

What is most likely explanation for the abnormal aPTT?

- 1- Antiphospholipid antibody syndrome
- 2- Disseminated intravascular coagulation
- 3- Idiopathic thrombocytopenic purpura
- 4- Thrombotic thrombocytopenic purpura
- 5- Haemolytic uraemic syndrome

Answer & Comments

Answer: 1- Antiphospholipid antibody syndrome

This patient has antiphospholipid antibody syndrome which is a non-inflammatory pro-thrombotic state in vivo, in the presence of laboratory tests suggesting an anticoagulant state.

The antiphospholipid antibodies (anticardiolipin and lupus anticoagulant) cause coagulation defect in-vitro (raised aPTT which fails to correct after the addition of

normal human plasma). However, despite the coagulation defects and thrombocytopenia, the lupus anticoagulant causes arterial and venous thromboses in vivo.

Disseminated intravascular clotting and thrombotic thrombocytopenic purpura are severe systemic illnesses, where bleeding may occur due to consumption of clotting factors, and platelets by an overactive clotting cascade.

Idiopathic thrombocytopenic purpura does not cause raised aPTT.



[Q: 3311] OnExamination 2012 - Rheumatology

A 58-year-old man has a one year history of anterior knee pain increased by climbing stairs, and walking. There is no rest or night pain. There is no history of joint swelling, alcohol use or chronic skin conditions.

On examination, there is crepitus on active and passive knee movements and knee flexion is painful beyond 110°. Hip and back movements are normal.

What is the most likely diagnosis?

- 1- Gout
- 2- Osteoarthritis
- 3- Osteonecrosis
- 4- Psoriatic arthritis
- 5- Rheumatoid arthritis

Answer & Comments

Answer: 2- Osteoarthritis

Osteoarthritis is likely as the joint pain is increased by activity.

Knee crepitus occurs with patella-femoral osteoarthritis.

Gout is unlikely, as there is no history of episodes of acute crystal synovitis. Also there are no risk factors for gout, for example,

excess alcohol intake, renal impairment, or diuretic use.

There is no symptom suggestive of inflammatory arthritis, for example, early morning stiffness, or synovitis.

The lack of a personal or family history of psoriasis makes psoriatic arthritis very unlikely.

Osteonecrosis is usually an acutely painful condition, presenting as acute exacerbation of knee pain in those with knee OA.



[Q: 3312] OnExamination 2012 - Rheumatology

A 28-year-old woman with a 15 year history of Raynaud's phenomenon and no other symptoms had some blood tests with her GP.

These show that she has a homogeneous pattern anti-nuclear antibody in a titre of 1:5120, and that she is negative for anti-dsDNA antibody using the Crithidia luciliae assay. A full blood count, urea electrolyte and creatinine, liver function tests, and C3 and C4 are normal.

What is the most likely diagnosis?

- 1- Discoid lupus erythematosus
- 2- Primary Raynaud's phenomenon
- 3- Scleroderma
- 4- Sjogren's syndrome
- 5- Systemic lupus erythematosus (SLE)

Answer & Comments

Answer: 2- Primary Raynaud's phenomenon

Diffuse staining ANA on immunofluorescence in high titre raises the possibility of systemic lupus erythematosus (SLE).

Further tests are required to ascertain if the diffuse staining ANA is due to anti-dsDNA (pathogenic in SLE) or due to anti ss-DNA antibody (not thought to play a pathogenic role in SLE).

Crithidia luciliae immunofluorescence is positive only in the presence of anti-dsDNA antibody. This is as Crithidia luciliae has a giant mitochondrion, with a circular dsDNA. It does not have ssDNA or any histones. In routine clinical practice, only anti-dsDNA are tested for. Diffuse staining ANA on immunofluorescence, in low titres (<1:160) is very common in the general population.

Although not mutually exclusive, different ANA immunofluorescence patterns suggest different diseases:

Anti-centromere pattern: limited cutaneous systemic sclerosis

Cytoplasmic pattern: Sjogren's syndrome, anti-synthetase syndrome

Nucleolar pattern: diffuse cutaneous systemic sclerosis

Speckled pattern: mixed connective tissue disease.

This patient has no symptoms to support the diagnoses of

Discoid lupus erythematosus (scarring photosensitive skin ulceration)

Sjogren's syndrome (dry eyes, dry mouth, fatigue)

Scleroderma (Raynaud's phenomenon, skin thickening, tightness, telangiectasia), and

SLE (photosensitive rash).

Anti-dsDNA antibodies are highly specific for diagnosis of SLE. However, they are neither necessary, nor sufficient in themselves for the diagnosis of SLE. At any one time only 50% patients with SLE have the anti-dsDNA antibody, while only 70% patients with SLE develop anti-dsDNA antibodies at any one time during the course of their illness.

Raynaud's phenomenon is a common clinical presentation, which may be primary or secondary to underlying disease. It can be diagnosed if there is a history of clearly

demarcated pallor of the digit(s) followed by at least one other colour change (cyanosis and/or erythema). Symptoms are usually precipitated by cold (or less commonly emotion). Vasospasm without endothelial damage is thought to be the main cause for primary RP. The pathogenesis of secondary forms is probably initiated primarily by endothelial damage.

Physical examination, nailfold capillaroscopy and immunological tests can differentiate between primary and secondary Raynaud's.

You should suspect secondary Raynaud's phenomenon if any of the following are present:

Onset at more than 30 years of age

Intense, painful or asymmetrical episodes

Presence of additional clinical features suggestive of underlying disease

Positive anti-nuclear antibody

Abnormal nailfold capillaries

Digital ulcers, gangrene or severe ischaemia of one or more digits.

Primary Raynaud's can be diagnosed if all the following are present:

No suspicion of underlying disease

Symmetrical episodes affecting both hands, but not necessarily all fingers

No tissue necrosis, ulceration, gangrene or severe ischaemia

Normal nailfold capillaries

Normal ESR and negative anti-nuclear antibodies.

Treatment involves prevention so that permanent ischaemic damage can be avoided. Patients should avoid exposure to the cold.

The mild forms of primary RP can be controlled by non-pharmacological approaches alone. If insufficient, the first choice therapy is calcium channel blockers. In severe forms, intravenous prostaglandin, endothelin-1 receptor antagonists and phosphodiesterase-5 inhibitors are used.

Future treatment options may include selective alpha-2c adrenergic receptor blockers, tyrosine and Rho-kinase inhibitors and calcitonin gene-related peptide.

Differential diagnosis of Raynaud's phenomenon includes:

Chilblains (perniosis): erythematous itchy swellings on fingers and toes in response to cold

Acrocyanosis: continuous blueness of the extremities aggravated by cold

Erythromelalgia: painful erythema caused by paroxysmal dilatation of blood vessels

Vascular embolism

Livedo reticularis: mottled, cyanotic discolouration of skin.

All the other features described here would be consistent with a diagnosis of primary Raynaud's disease.

Whilst miscarriage can be associated with connective tissue disease, in particular antiphospholipid syndrome, it is common in the population especially in early pregnancy.



[Q: 3313] OnExamination 2012 - Rheumatology

A 76-year-old lady with stable congestive cardiac failure presents to the Emergency department at 11 pm with a two day history of a painful hot swollen right knee. She is unable to weight bear. She lives alone. Her temperature is 37.4°.

Which of the following is the most crucial step in her management?

- 1- Aspirate the right knee for urgent Gram stain, microscopy, culture and sensitivity
- 2- Provide non-steroidal anti-inflammatory for pain relief
- 3- Prescribe paracetamol and discharge home with GP follow up
- 4- Take a full history from the patient, in particular, enquire into any previous episodes of joint pain
- 5- x Ray the right knee

Answer & Comments

Answer: 1- Aspirate the right knee for urgent Gram stain, microscopy, culture and sensitivity

This lady has presented with an acute onset monoarthritis. A destructive septic arthritis is a potential diagnosis, and must be excluded as a matter of urgency. An aspirate is the most crucial step to exclude this and allow the timely commencement of appropriate antibiotics. Differential diagnoses include gout and pseudogout, which can also be diagnosed on joint aspiration.

Regarding the options:

B. Although non-steroidal anti-inflammatories would be useful as pain relief they may exacerbate the congestive cardiac failure and should be used with caution. Also the renal function must be checked to ensure a non-steroidal anti-inflammatory can be used.

C. Discharging home with paracetamol is not an acceptable management plan as the lady lives alone and cannot weight bear. She is unlikely to cope and will be at risk of falls.

D. A full history is imperative in formulating a differential diagnosis. For example, previous similar episodes in her great toes and the use of diuretics may suggest a diagnosis of acute gout. However, this does not exclude a destructive septic arthritis. An aspirate is the most crucial step to exclude this and allow

the timely commencement of appropriate antibiotics.

E. In the acute stages of septic arthritis there may be no signs of damage to the joint seen on a radiograph. It may show typical changes of calcium pyrophosphate dihydrate deposition disease or gout, which may help in her long term management, but this would not change the management in this acute situation.



[Q: 3314] OnExamination 2012 - Rheumatology

A 75-year-old woman with polymyalgia rheumatica (PMR) presents with a two week history of sudden onset right temporal headache, pain whilst brushing her hair. There are no visual symptoms. She is currently on prednisolone 8 mg/day.

On examination, there is tenderness overlying the right temporal artery.

Recent blood tests show:

Hb 11.1g/dl(11.5 - 16.5 g/dL)

WBC $7.8 \times 10^9/L$ ($4 - 11 \times 10^9/L$)

Neutrophils 70%(40-75%)

Platelet $270 \times 10^9/L$ ($150 - 400 \times 10^9/L$)

ESR 76 mm/hr(0 - 30 mm/1st hr)

CRP 93 mg/L(< 10 mg/L)

Urea, electrolytes and creatinine Normal

What is the next step in her management?

- 1- Admit for intravenous methyl prednisolone.
- 2- Arrange temporal artery biopsy
- 3- Increase prednisolone to 15 mg/day.
- 4- Increase prednisolone to 40 mg/day
- 5- Increase prednisolone to 40 mg/day, and arrange a temporal artery biopsy

Answer & Comments

Answer: 5- Increase prednisolone to 40 mg/day, and arrange a temporal artery biopsy

These symptoms and investigation findings are typical of giant cell arteritis (GCA).

GCA affects large and medium sized arteries, with a predilection for the external carotid, ciliary and retinal arteries. Endovascular damage and cytokine-mediated inflammation causes local ischaemia. There is considerable overlap with polymyalgia rheumatica (PMR), and symptoms of both should be sought. About 50% of patients with GCA also have PMR, and about 10% of those with PMR also have GCA. 20% of patients develop loss of vision, which can be prevented with timely recognition and treatment. Visual loss typically occurs early in the course of disease and, once established, rarely improves. The classically described jaw claudication occurs in a minority of cases, but does indicate a high risk of ischaemic complications.

The typical presentation of GCA is a temporal headache, with myalgia, malaise and fever. ESR and CRP are usually raised.

As soon as the diagnosis is suspected, high dose corticosteroids should be given. Current BSR guidelines recommend:

- Uncomplicated GCA (no jaw or tongue claudication, or visual symptoms): prednisolone 40-60mg daily
- Complicated GCA:
 - Evolving visual loss or history of amaurosis fugax: IV methylprednisolone 500mg-1g daily for three days, followed by oral corticosteroids
 - Established visual loss: at least 60mg prednisolone daily

Bone protection and proton-pump inhibitors should be co-prescribed.

It is important to note that the pathological findings of giant cell arteritis persist for one to two weeks following initiation of corticosteroid, and therefore treatment should not be delayed to obtain a biopsy.

Aspirin 75mg once daily is sometimes given as an adjunct but higher doses are not recommended.

Symptoms usually resolve quickly, often with two or three days. Once they and laboratory abnormalities resolve, the dose of corticosteroid can be reduced and usually stopped within two years. The patient should be monitored for recurrence throughout the taper: ESR every 4 weeks for 2-3 months, then every 8-12 weeks until 12-18m after cessation of therapy.

Giant cell arteritis is a medical emergency and should be treated without delay. It is not acceptable to give no treatment.



[Q: 3315] OnExamination 2012 - Rheumatology

You see a 44-year-old woman with a three month history of progressive pain, swelling and stiffness in both knees. Her symptoms are worse in the morning, and it takes an hour or so to loosen up the joints. She has had no recent preceding illness and there is no personal or family history of any chronic skin conditions.

Since she was a teenager she has had painful fingers and toes when they are exposed to cold weather, but her digits do not change colour. She has also recently had pain and stiffness in her fingers and toes in the morning, and this fluctuates from day to day. She occasionally drinks alcohol.

On examination you find reduced flexion and extension and an effusion in both knees. She has bilateral metatarsalgia on squeezing her toes. Examination of her fingers is normal and there is no psoriasis of her skin or nails.

Recent blood tests showed:

Haemoglobin 13.1gm/dl(13.0 - 18.0 g/dL)

White cell count $8.2 \times 10^3/\mu\text{l}$ (4 - $11 \times 10^9/\text{L}$)

Neutrophil count $5.1 \times 10^3/\mu\text{l}$ (1.5 - $7 \times 10^9/\text{L}$)

Platelet count $280 \times 10^3/\mu\text{l}$ (150 - $400 \times 10^9/\text{L}$)

ESR 48 mm/hr(0 - 20 mm/1st hr)

Urea 5.0 mEq/L(2.5 - 7.5 mmol/L)

Creatinine 82 mEq/L(60 - 110 $\mu\text{mol/L}$)

Sodium 142 mEq/L(137 - 144 mmol/L)

Potassium 4.2 mEq/L(3.5 - 4.9 mmol/L)

Rheumatoid factor (RF): positive (1:256)

Antinuclear antibody (ANA): positive (1:40)

What is the most likely diagnosis?

- 1- Rheumatoid arthritis
- 2- Reactive arthritis
- 3- Systemic lupus erythematosus
- 4- Pseudogout
- 5- Psoriatic arthritis

Answer & Comments

Answer: 1- Rheumatoid arthritis

A. Rheumatoid arthritis

Patients with rheumatoid arthritis often present with synovitis which may affect a variety of joints before developing the classic features of a symmetrical, inflammatory polyarthritis affecting the small joints of the hands and feet.

This patient has symptoms suggestive of peripheral synovitis, even though her signs are limited on the day of examination. The working diagnosis has to be rheumatoid arthritis, in view of the clinical history, duration and distribution of symptoms and signs, and the fact that she is strongly positive for rheumatoid factor.

Learning bite: Diagnosing rheumatoid arthritis:

Rheumatoid arthritis is a clinical diagnosis. The classic features are:

Symmetrical inflammatory polyarthritis

Arthritis affecting the small joints of the hands and feet.

The most commonly used classification criteria are the American College of Rheumatology criteria. These criteria do not perform well in early disease.

Diagnostic tests are:

Rheumatoid factor: there are many false positive and negatives

Anticyclic citrullinated peptide antibody (anti CCP antibody): more specific for rheumatoid arthritis

Antinuclear antibody: present in 20-30% of patients with rheumatoid arthritis.

B. Reactive arthritis

The absence of any preceding infection and symmetry of her symptoms and signs makes the diagnosis of reactive arthritis unlikely.

C. Systemic lupus erythematosus

This patient does not have other features of systemic lupus erythematosus which one may expect. She only has a low titre of antinuclear antibody which makes the diagnosis of systemic lupus erythematosus unlikely, although it is important to note ANA is not specific for systemic lupus erythematosus.

Learning bite: Inflammatory arthritis in systemic lupus erythematosus:

The inflammatory arthritis of systemic lupus erythematosus typically affects the hands, wrists and knees, with often little in the way of signs, but significant symptoms. Swelling is mainly soft tissue with small joint effusions. Large knee effusions are unusual.

D. Pseudogout

Pseudogout is caused by deposition of calcium pyrophosphate dihydrate (CPPD) crystals, and can present as an acute monoarthritis. It commonly affects older individuals, over 70-years-old, or those with pre-existing osteoarthritis. Attacks of pseudogout begin over a period of a few hours and usually subside after two weeks.

Although knees are the most frequently involved joint in pseudogout, the age of this patient and length of symptoms make the diagnosis of pseudogout very unlikely.

E. Psoriatic arthritis

Lower limb oligoarthritis is one of the manifestations of psoriatic arthritis. However the absence of a family history of psoriasis or any psoriasis on examination makes this diagnosis unlikely.



[Q: 3316] OnExamination 2012 - Rheumatology

A 51-year-old man presents with increasing lethargy over the past few months. He has had to give up his job as a storeman, and it now takes him 15 minutes to get up one flight of stairs and he has difficulty getting up out of a chair.

On examination his BP is 135/82 mmHg, pulse is 85 and regular. His heart sounds are normal and his chest is clear. He has clear proximal muscle weakness, with sparing of distal muscle power. His CK is elevated at 1200.

Which of the following antibodies is most likely to be elevated?

- 1- Anti-Jo antibody
- 2- Anti-La antibody
- 3- Anti-nuclear antibody
- 4- Anti-Rho antibody
- 5- Anti-smooth muscle antibody

Answer & Comments

Answer: 1- Anti-Jo antibody

The proximal myopathy and raised creatine kinase (CK) in the absence of a violaceous rash suggests that polymyositis is the most likely diagnosis.

Polymyositis is associated with the presence of anti-Jo 1 antibodies. Corticosteroids are the mainstay of immunosuppression. Patients with anti-Jo 1 antibodies are at increased risk of lung fibrosis, and therefore immunosuppression is usually continued long term.

A steroid sparing agent, such as azathioprine, may well be added to reduce the corticosteroid dose.

Anti-Rho and -La antibodies are seen in systemic lupus erythematosus (SLE) and are associated with the development of neonatal lupus.

Antinuclear antibodies are seen in a variety of autoimmune disorders, and the pattern can be used to diagnose different conditions.

Some of the common patterns seen are:

Homogenous (diffuse) - SLE, mixed connective tissue disease

Speckled - SLE, Sjogren syndrome, systemic sclerosis, polymyositis, rheumatoid arthritis, mixed connective tissue disease

Nucleolar - systemic sclerosis, polymyositis

Centromere - systemic sclerosis, CREST syndrome.

Antismooth muscle antibodies are associated with autoimmune hepatitis.



[Q: 3317] OnExamination 2012 - Rheumatology

A 16-year-old girl comes to the surgery feeling under the weather. She has recently suffered from a streptococcal throat infection but feels that she has not really picked up since, although she did have a course of oral penicillin.

She complains of an extensive purpuric rash which is affecting her buttocks, the back of her legs, and the ulnar side of her arms. There is also a history of abdominal and joint pains.

On examination her BP is 105/70 mmHg, with a pulse of 75. She has a purpuric rash, mainly affecting her buttocks and the tops of her legs.

Investigations show

Haemoglobin 11.5 g/dl (11.5-16.0)

White cell count $11.2 \times 10^9/L$ (4-11)

Platelets $230 \times 10^9/L$ (150-400)

Serum Sodium 140 mmol/l (135-146)

Serum Potassium 4.2 mmol/l (3.5-5)

Creatinine 135 $\mu\text{mol/l}$ (79-118)

Urine Blood ++

Protein ++

Which of the following immunoglobulins is most likely to be raised?

1- IgA

2- IgD

3- IgE

4- IgG

5- IgM

Answer & Comments

Answer: 1- IgA

This patient has Henoch-Schönlein purpura (HSP). HSP is more commonly seen in infants, but may also be seen in older individuals.

The buttock rash seen here is characteristic as is the blood and proteinuria. Creatinine may be elevated, although progression to renal failure is rare. Platelet count can be low, normal or elevated. IgA levels are elevated and the patient may also have an eosinophilia.

HSP is usually managed with supportive measures only. There is no evidence that

steroid therapy impacts on progression to renal failure.

Non-steroidals may be of value in treating joint pain.



[Q: 3318] OnExamination 2012 - Rheumatology

A 57-year-old woman presents to the clinic with increasing shortness of breath. She has a history of hypertension for which she takes amlodipine, reflux oesophagitis, and Raynaud's phenomenon.

On examination you notice that her skin has a speckled appearance, and she has peripheral calcinosis on examination of her hands. Respiratory examination reveals inspiratory crackles consistent with pulmonary fibrosis.

Investigations reveal

Haemoglobin 10.4 g/dl(11.5-16)

White cell count $9.2 \times 10^9/L$ (4-10)

Platelets $190 \times 10^9/L$ (150-400)

Sodium 140 mmol/l (134-143)

Potassium 4.9 mmol/l (3.5-5)

Creatinine 139 $\mu\text{mol/l}$ (60-120)

SaO₂ on air 94%(?96%)

CXR Interstitial shadowing consistent with fibrosis

Which of the following autoantibodies is most associated with her respiratory picture?

- 1- Anti-centromere antibodies
- 2- Anti-PM/Scl antibodies
- 3- Anti-Scl-70 antibodies
- 4- Anti-smooth muscle antibodies
- 5- Rheumatoid factor antibodies

Answer & Comments

Answer: 3- Anti-Scl-70 antibodies

This woman has a clinical picture which is consistent with systemic sclerosis.

Systemic sclerosis is a chronic autoimmune disease characterised by increased fibroblast activity and fibrosis in a number of different organ systems. Ninety to 95% of patients have positive antinuclear antibodies.

There are two major subtypes: limited cutaneous and diffuse cutaneous.

CREST syndrome is an older term for the limited cutaneous form (calcinosis, Raynauds' phenomenon, oesophageal dysmotility, sclerodactyly, telangiectasia).

Patients with systemic sclerosis can present with

Skin abnormalities

Musculoskeletal changes

Gastrointestinal complications

Pulmonary disease

Renal crisis and

Dry eyes and mouth.

Pulmonary fibrosis is associated with anti-Scl-70 antibodies in up to 70% of cases.

Pulmonary involvement is the second commonest organ involvement after oesophageal disease and is the leading cause of death.

Anticentromere antibodies are more commonly seen in patients without pulmonary fibrosis.

Anti-PM/Scl antibodies are a rarely encountered type of antinuclear antibodies. They are mainly seen in association with idiopathic myositis, systemic sclerosis overlap syndromes, polymyositis and dermatomyositis.

Anti-smooth muscle antibodies are associated with autoimmune hepatitis.

Rheumatoid factor is non-specific, but is seen at increased frequency in patients with rheumatoid arthritis.



[Q: 3319] OnExamination 2012 -
Rheumatology

A 50-year-old Asian lady with severe rheumatoid arthritis has failed on most traditional disease modifying anti-rheumatic drugs (DMARD) treatments.

She is currently on methotrexate 20 mg weekly and for the last six months has been receiving regular infusions of the anti-tumour necrosis factor (TNF)-alpha monoclonal antibody, infliximab. Her joint disease has dramatically improved.

She now presents with fevers, pleuritic chest pain and a large left sided pleural effusion, but little evidence of joint synovitis.

What is the most likely diagnosis?

- 1- Primary bronchial carcinoma
- 2- Pulmonary embolus
- 3- Pulmonary metastases
- 4- Rheumatoid related effusion
- 5- Tuberculosis

Answer & Comments

Answer: 5- Tuberculosis

The most likely answer is TB.

All of the other answers are possible and need to be excluded.

A rheumatoid effusion is unlikely when peripheral joint disease is so well controlled.

Treatment with anti-TNF-alpha increases the risk of opportunistic infections and in particular, there is a significant increase in the risk of TB reactivation in conjunction with infliximab.



[Q: 3320] OnExamination 2012 -
Rheumatology

A 55-year-old lady has recently commenced on 20 mg of leflunomide daily for sero-negative rheumatoid arthritis.

At baseline, prior to commencing the drug, her AST was 33 U/l (1-31) and her ALT was 40 U/l (5-35).

She attends for routine blood monitoring. Her FBC is normal but her liver function tests (LFTs) reveal:

AST 58 U/l (1-31)

ALT 71 U/l (5-35)

Alkaline phosphatase 100 U/l (45-105)

Bilirubin 12 µmol/l (1-22)

What is the most appropriate management option for this patient?

- 1- Continue leflunomide and monitor LFTs in one month
- 2- Continue leflunomide and monitor LFTs in two weeks
- 3- Reduce the dose and recheck LFTs in one week
- 4- Stop leflunomide and commence washout procedure
- 5- Stop the leflunomide and repeat tests in two weeks

Answer & Comments

Answer: 3- Reduce the dose and recheck LFTs in one week

Leflunomide is associated with serious hepatotoxicity.

Increased aminotransferases are commonly seen in association with therapy occurring in 15-20% of cases (less than a twofold rise).

However, more serious elevation (greater than threefold) is seen in less than 5%.

Generally, most hepatic events occur within the first six months of use. It is recommended liver function tests (LFTs) be checked monthly for six months and, if stable, two monthly thereafter.

If aspartate aminotransferase (AST) or alanine aminotransferase (ALT) is between two and

three times the upper limit of normal, and the leflunomide dose is more than 10 mg daily, the dose should be reduced to 10 mg and LFTs rechecked weekly until normalised. If the ALT and AST are returning to normal, the patient should be left on 10 mg per day. If the LFTs remain elevated, leflunomide should be stopped and discussed with the specialist team.

If the AST or ALT is more than three times the upper limit of normal, the LFTs should be rechecked within 72 hours. If they remain more than three times the reference range, leflunomide should be stopped and washout considered (cholestyramine and activated charcoal). It is important to note that the half life of leflunomide is usually two weeks (mean 1-4) therefore if a rapid response is required, washout should be considered.

Current UK guidance also recommends frequent monitoring for patients on leflunomide. Full blood count (FBC) should be checked monthly for six months and, if stable, two monthly thereafter.

White cell count less than 3.5, neutrophils less than 2 or platelets less than 150 should be discussed with the specialist team, and leflunomide withheld until this has taken place.

Monitoring should be continued at least monthly in the long term if leflunomide is co-prescribed with any other immunosuppressant or potentially hepatotoxic agent.

In addition, signs of leflunomide toxicity should be monitored. If the patient develops a rash or itch dose reduction should be considered, with or without the addition of antihistamines. If severe, leflunomide should be stopped and washout considered.

Hair loss, headaches and gastrointestinal upset may also warrant dose reduction or washout.

A blood pressure of greater than 140/90 mmHg should be treated as per NICE guidelines. If it remains elevated, stop leflunomide and consider washout.

Weight should be monitored, and a weight loss of greater than 10% should be identified. If no other cause can be found, consider dose reduction or washout.

If there is increasing shortness of breath, pneumonitis should be considered and leflunomide should be stopped.



[Q: 3321] OnExamination 2012 - Rheumatology

A 60-year-old lady with rheumatoid arthritis has been on long term therapy to control her disease.

She presents with increasing shortness of breath and a chest x ray shows 'bilateral interstitial shadowing'.

Which of the following medications is the most likely cause for her symptoms?

- 1- Azathioprine
- 2- Hydroxychloroquine
- 3- Infliximab
- 4- Methotrexate
- 5- Sulfasalazine

Answer & Comments

Answer: 4- Methotrexate

Methotrexate is a recognised cause of pulmonary fibrosis. However, it is sometimes used in the treatment of idiopathic pulmonary fibrosis as a steroid sparing agent.

"Pulmonary parenchymal or pleural reactions to chemotherapeutic agents used in the management of patients with malignant diseases are being recognized with increasing frequency. Alkylating agents, asparaginase, bleomycin, methotrexate and procarbazine

have all been implicated." West J Med. 1977 October; 127(4): 292-298

"Drug-related interstitial pneumonia should also be considered in rheumatoid arthritis patients on methotrexate or newer drugs such as leflunomide." Curr Opin Pulm Med. 2006 Sep;12(5):346-53



[Q: 3322] OnExamination 2012 - Rheumatology

A 33-year-old female presents with pain at the elbow which she has been aware of for the last two weeks.

Which of the following would be consistent with a diagnosis of tennis elbow?

- 1- Pain on extension of the elbow
- 2- Pain on flexion of the fingers against resistance
- 3- Pain on pressure over the medial epicondyle
- 4- Pain on pronation of the forearm
- 5- Pain on wrist extension against resistance

Answer & Comments

Answer: 5- Pain on wrist extension against resistance

Tennis elbow is due to lateral epicondylitis and is due to overuse/strain of the extensor muscles of the forearm. It is most common in the fourth decade.

On examination there is pain in the region of the lateral epicondyle during resisted extension of the fingers and wrist.

Management is initially with a reduction in strenuous activity for at least six weeks, with or without a wrist splint.

Local injection with corticosteroid and anaesthetic agents is also a possibility. Surgical treatment is reserved for those with refractory symptoms.



[Q: 3323] OnExamination 2012 - Rheumatology

A 34-year-old nulliparous woman attends clinic because she wants to start a family as soon as possible. She is currently receiving weekly methotrexate for rheumatoid arthritis, but her rheumatologist has suggested that she would be able to stop taking it soon.

Assuming that there are no other contraindications to her becoming pregnant, how long should she wait before stopping the oral contraceptive pill (OCP) and trying to conceive in relation to her discontinuing methotrexate treatment?

- 1- She can stop the OCP at the same time as she stops methotrexate
- 2- She should continue the OCP for at least two weeks after stopping methotrexate.
- 3- She should continue the OCP for at least one month after stopping methotrexate
- 4- She should continue the OCP for at least three months after stopping methotrexate
- 5- She should continue the OCP for at least one year after stopping methotrexate

Answer & Comments

Answer: 4- She should continue the OCP for at least three months after stopping methotrexate

Methotrexate is teratogenic and, according to the British National Formulary (BNF), the manufacturers advise effective contraception during and for at least three months after stopping methotrexate (both males and females).

Fertility may be reduced during treatment, but this usually reverses upon stopping.

The National Patient Safety Agency (NPSA) state on their patient held record that 'It is recommended that you wait six months after

finishing your treatment, before trying to become pregnant'.



[Q: 3324] OnExamination 2012 - Rheumatology

A 16-year-old girl developed pulmonary haemorrhage and acute renal failure requiring dialysis.

She has a history of recurrent epistaxis.

Investigations revealed:

Renal biopsy Crescentic glomerulonephritis

Which one of the following antibodies is most likely to be found in the blood?

- 1- Anticardiolipin
- 2- Anticentromere
- 3- Antimitochondrial
- 4- Antimyeloperoxidase
- 5- Antinuclear

Answer & Comments

Answer: 4- Antimyeloperoxidase

This patient manifests a pulmonary renal syndrome which is most commonly due to an antineutrophil cytoplasmic antibody test (ANCA) positive vasculitis and less commonly due to Goodpasture's syndrome (antiglomerular basement membrane [GBM] antibodies). The history of epistaxis makes Wegener's granulomatosis the more likely diagnosis.

ANCA antibodies are of two types:

cANCA which correlates with antiproteinase 3 antibodies (PR3)cANCA and specificity for the PR3 antigen is most specific for Wegener's granulomatosis. Proteinase-3 is a neutral serine proteinase present in azurophil granules of human neutrophils. Antibodies against it may be present in isolation without a cANCA. In Wegener's, the level of PR3 antibody and ANCA titre are related to

disease activity and the antibodies typically disappear when the disease is in remission.

pANCA and/or antibody to MPO are far less specific than cANCA and can be present in a range of inflammatory conditions such as microscopic polyangiitis, Churg-Strauss syndrome and Goodpasture's syndrome. MPO and pANCA may also be present in systemic lupus erythematosus (SLE), rheumatoid arthritis, Sjogren syndrome and occasionally in chronic infections. They are positive in 10% of patients with Wegener's granulomatosis and are the most likely antibody to be present in this case, where proteinase-3 is not an option.

Wegener's granulomatosis is a multi-organ autoimmune disease which can be fatal.

The classical triad consists of

Necrotising granulomatous inflammation of the respiratory tract

Glomerulonephritis and

A small-vessel vasculitis.

A prolonged history of epistaxis or sinusitis is commonly found in Wegener's granulomatosis, which in some patients is also associated with an eosinophilia. The detection of antineutrophil cytoplasmic antibodies directed against proteinase-3 is highly specific, but is found in only 50% of patients with disease localised to the respiratory tract and 95% with generalised Wegener's.

Standard therapy is with cyclophosphamide and corticosteroids. TNF-alpha blocking agents, antithymocyte globulin and monoclonal anti-T cell antibodies can be used in disease refractory to these agents.

Systemic inflammation and vasculitis contribute to accelerated atherosclerosis in patients with Wegener's and there is therefore a significantly increased incidence

of stroke, myocardial infarction and occlusive artery disease.

Antimitochondrial antibodies are found in primary biliary cirrhosis.

Anticentromere antibodies are found in CREST/scleroderma syndrome.

Aniinuclear (ANA) and anticardiolipin antibodies are found in systemic lupus erythematosus (SLE) which is not a cause of pulmonary renal syndrome.



[Q: 3325] OnExamination 2012 - Rheumatology

A 34-year-old man with psoriasis has a three week history of painful swollen right knee and difficulty walking. He has early morning stiffness of over an hour.

He drinks six units of alcohol/week and has not had any recent infections.

On examination there is a right knee effusion, and swollen and tender distal interphalangeal joints in right hand index and middle finger.

Here are the results of recent blood tests:

Haemoglobin 14 g/dl(13.0 - 18.0 g/dL)

WBC $9 \times 10^9/L$ ($4 - 11 \times 10^9/L$)

Neutrophils $6 \times 10^9/L$ ($1.5 - 7 \times 10^9/L$)

ESR 45 mm/hr(0 - 15 mm/1st hr)

Urea, electrolytes and creatinine: Normal

Rheumatoid factor: Negative

What is the most likely diagnosis?

- 1- Gout
- 2- Osteoarthritis
- 3- Psoriatic arthritis
- 4- Reactive arthritis (RA)
- 5- Rheumatoid arthritis

Answer & Comments

Answer: 3- Psoriatic arthritis

This patient has psoriatic arthritis.

Among people who develop psoriatic arthritis, two-thirds develop joint symptoms after skin involvement. In the absence of psoriasis, a positive family history of psoriasis in a first degree relative supports the diagnosis of psoriatic arthritis.

RA is unlikely as there is asymmetrical joint involvement - with predominant involvement of the distal interphalangeal (DIP) joints in the hands. DIP joint involvement is a distinctive feature of psoriatic arthritis. DIP joint involvement associates with dactylitis, nail pitting and onycholysis (separation of nail from nail bed).

The absence of preceding infection makes reactive arthritis unlikely.

Gout is unlikely.

The alcohol intake is not excessive, and except for male gender, there is no other risk factor, for example, age greater than 40 years, diuretic use, renal failure and solid organ transplant.



[Q: 3326] OnExamination 2012 - Rheumatology

A 28-year-old woman without any past medical history presents with a three month history of arthralgia. She has no past medical history of note.

Examination reveals swelling of the distal interphalangeal joints of the middle and ring fingers of the hand and wrist on the right plus a swollen left ankle.

Investigations show:

ESR 40 mm/hr (0-10)

Which of the following is the most likely diagnosis?

- 1- Acute exacerbation of osteoarthritis
- 2- Psoriatic arthropathy
- 3- Reactive arthritis

- 4- Rheumatoid arthritis
5- Systemic lupus erythematosus

Answer & Comments

Answer: 2- Psoriatic arthropathy

This woman has psoriatic arthritis. Synovitis is indicative of an inflammatory arthritis. The rash typically predates the arthropathy by a number of years, but the opposite can be true. Small plaques should be looked for on the elbows and scalp. There are five patterns of disease:

- Symmetrical polyarthritis ('rheumatoid pattern') - affects wrists, hands, feet and ankles. The distal interphalangeal joints are more commonly affected than the metacarpophalangeal joints, which helps to distinguish it from rheumatoid arthritis.
- Asymmetrical oligoarticular arthritis: dactylitis.
- Distal interphalangeal joint disease: typically in men.
- Arthritis mutilans: rare.
- Spondylitis pattern with sacroileitis.

Rheumatoid arthritis typically affects the metacarpophalangeal and proximal interphalangeal joints symmetrically. Psoriatic arthritis affects the distal interphalangeal joints and tends to be asymmetrical.

Joint involvement in systemic lupus erythematosus occurs in the form of a polyarticular arthralgia, frequently symmetrical and episodic. Intense tendonitis is more common than synovitis and can lead to deforming reversible subluxation of joints without erosive disease (Jaccoud's arthropathy).

Osteoarthritis would be unusual in someone of this age group.

Reactive arthritis is a sterile inflammatory arthritis which develops as a sequel to

remote infection, usually of the gastrointestinal or urogenital tract. There is no history of such infection in this case.



[Q: 3327] OnExamination 2012 - Rheumatology

A 25-year-old student presents to the casualty department with a systemic illness.

She appears unwell, with a swinging fever, 3 kg weight loss over two months, generalised myalgia, polyarthralgia affecting wrists, knees, ankles, elbows and metacarpophalangeal joints, and a sore throat.

Investigations demonstrate normochromic normocytic anaemia 9.8 g/l, ESR 81 mm in the first hour, CRP 31 g/l, serum ferritin 1756 mg/dl, RF negative, ANA negative, ENA negative, ASO titre <200 IU.

What is the most likely diagnosis?

- 1- Adult onset Still's disease (AOSD)
- 2- Polymyositis
- 3- Rheumatic fever
- 4- Seronegative rheumatoid arthritis
- 5- Systemic lupus erythematosus

Answer & Comments

Answer: 1- Adult onset Still's disease (AOSD)

The most likely diagnosis in this case is adult onset Still's disease. This is a rare systemic inflammatory disease characterised by high spiking fever, evanescent salmon pink rash, polyarthralgia, lymphadenopathy, hepatosplenomegaly and neutrophilic leucocytosis. There is often an accompanying sore throat and myalgia.

The fever occurs once or twice daily and is described as quotidian or dquotidian returning to 37°C or below between episodes.

The characteristic evanescent salmon-coloured non-pruritic macular or macular-

popular rash occurs in approximately 90% of patients and is often seen only when the patient is febrile and is easily missed.

Aetiology is not clearly understood, but it is likely triggered by an infectious agent in a genetically predisposed host.

Diagnosis is clinical, and should include exclusion of infectious disease, neoplasms and other autoimmune disease. Laboratory tests reflect systemic inflammation, with a high ESR, leucocytosis and raised acute phase reactants (in particular ferritin). Rheumatoid factor and antinuclear antibody are typically negative. Liver function tests can be abnormal. High serum ferritin, with low glycosylated fraction, are characteristic and can be used as disease activity markers. Interleukin (IL)-1, IL-6, IL-18, macrophage colony stimulating factor, interferon gamma and TNF-alpha are all elevated.

The clinical course can be divided into:

Self-limited or monophasic intermittent

Polycyclic systemic

Chronic articular pattern.

Prognosis tends to be better when systemic symptoms predominate.

Therapy includes non-steroidal anti-inflammatory drugs (NSAIDs), corticosteroids, disease-modifying anti-rheumatic drugs and biological agents. Intravenous immunoglobulin may have a role.

Polymyositis is an inflammatory condition which typically presents with relatively painless, progressive, proximal muscle weakness.

Rheumatic fever develops in relation to group A streptococcal infection. It presents with chorea, carditis, subcutaneous nodules, erythema marginatum and migratory polyarthritides.

Systemic upset to the extent described in the above case is unusual with rheumatoid arthritis. One would expect ANA to be positive in systemic lupus erythematosus.



[Q: 3328] OnExamination 2012 - Rheumatology

A 60-year-old man presents with right foot drop, left foot and left hand numbness, fever, malaise, weight loss, polymyalgia and polyarthralgia of approximately one month duration.

On examination, he appears ill, with a temperature of 38.5°C and blood pressure of 180/100 mmHg.

Investigations reveal:

Haemoglobin 8.0 g/dL (13.0-18.0)

Erythrocyte sedimentation rate 100 mm/hr (0-20)

Serum Creatinine 180 µmol/L (60-110)

Urine analysis: Blood ++

Urine microscopy: White cells and red cell casts

Which one of the following is the most likely diagnosis?

- 1- Antiphospholipid syndrome
- 2- Giant cell arteritis
- 3- Paraneoplastic syndrome
- 4- POEMS syndrome
- 5- Polyarteritis nodosa (PAN)

Answer & Comments

Answer: 5- Polyarteritis nodosa (PAN)

This patient has a mononeuritis multiplex, fever, hypertension, and nephritic renal involvement which is most consistent with a diagnosis of polyarteritis nodosa.

PAN is a systemic transmural necrotising vasculitis that usually affects medium-sized arteries. Signs and symptoms are primarily

attributable to diffuse vascular inflammation and ischaemia of the affected organs. In adults it most commonly presents in men between 40-50y, and may be associated with hepatitis B. Virtually any organ with the exception of the lung can be affected, with peripheral neuropathy and symptoms from osteoarticular, renal artery and gastrointestinal tract involvement being the most frequent clinical manifestations.

The diagnostic criteria used are based on the American College of Rheumatology (ACR) and Chapel Hill Consensus criteria:

- Symptoms/signs must be compatible with a diagnosis of ANCA-associated vasculitis or PAN
- Plus one of:
 - o Histological proof of vasculitis and/or granuloma formation
 - o Positive ANCA serology
 - o Specific investigations strongly suggestive of vasculitis and/or granuloma
 - o Eosinophilia (>10%)
- No other potential diagnosis to explain the signs and symptoms:
 - o Malignancy
 - o Infection (HBV, HCV, HIV, TB, subacute bacterial endocarditis)
 - o Drugs (hydralazine, propylthiouracil, cocaine, allopurinol)
 - o Secondary vasculitis (resulting from rheumatoid arthritis, SLE, Sjogren's)
 - o Sarcoidosis or other vasculitic conditions
 - o Vasculitis mimicking diseases (e.g. cholesterol emboli, antiphospholipid)

Hepatitis B surface antigen is positive in 30%, and p-ANCA is usually positive. Angiography demonstrates microaneurysms in affected

organs, and biopsy shows necrotising inflammation.

PAN can be further classified into systemic vs limited (cutaneous) and idiopathic vs hepatitis B, and this is important due to differences in pathogenesis and therefore treatment and prognosis.

The mainstay of treatment for idiopathic PAN is currently corticosteroids and cyclophosphamide, whereas for hepatitis B related disease plasmapheresis and antiviral agents should be used. Azathioprine can be used as maintenance therapy, and typically has fewer side effects than cyclophosphamide.

Antiphospholipid syndrome is a thrombotic disorder that manifests clinically as recurrent venous or arterial thrombosis and/or foetal loss. It is not usually associated with a polyneuropathy.

POEMS is a rare systemic disorder which consists of polyneuropathy, organomegaly, endocrinopathy monoclonal gammopathy and skin changes, of which a few features are absent; and nephritic syndrome is not a feature.

Giant cell arteritis affects large and medium sized arteries, most commonly branches of the external carotid artery. It typically presents with unilateral headache and threatened sight, which does not fit with the clinical scenario above.

Vasculitis can be a paraneoplastic syndrome, but this is rare and you would expect symptoms from the primary tumour. In a recent case series it most commonly presented with features of a cutaneous vasculitis.



[Q: 3329] OnExamination 2012 - Rheumatology

A 25-year-old female is admitted with acute dyspnoea and chest pain.

A diagnosis of pulmonary embolism is confirmed and her investigations reveal urine dipstick protein ++ but no blood, anti-double stranded DNA antibodies of 200 U/mL (0 - 73), with a 24 hour urinary protein concentration of 5g (< 0.2).

Which one of the following diagnoses is most likely to be found on renal biopsy?

- 1- AA amyloid
- 2- Focal segmental glomerulosclerosis
- 3- IgA nephropathy
- 4- Membranous nephropathy
- 5- Minimal change nephropathy

Answer & Comments

Answer: 4- Membranous nephropathy

This young woman has thromboembolic disease, nephrotic syndrome and positive anti-ds DNA antibodies, all of which suggests a diagnosis of systemic lupus erythematosus.

The renal manifestations of SLE are highly variable, ranging from mild asymptomatic proteinuria and/or haematuria to rapidly progressive uraemia. The various presentations are difficult to classify into clinical syndromes and histological classes. Although lupus nephritis affects a third of patients early in the disease it is frequently unrecognised until nephritic and/or nephrotic syndrome with renal failure occur.

Histologically, a number of different types of renal disease are recognised in SLE, with immune-complex mediated glomerular disease being the most common. The standard classification divides these into five different patterns:

- I - no disease
- II - mesangial
- III - focal proliferative
- IV - diffuse proliferative

V - membranous

Mesangial nephritis represents the earliest and mildest form of glomerular involvement. It presents clinically as microscopic haematuria and/or proteinuria. Hypertension is uncommon and nephrotic syndrome and renal impairment are very rarely seen. Biopsy demonstrates segmental areas of increased mesangial matrix and cellularity. The prognosis is good and specific treatment is only indicated if the disease progresses.

Focal proliferative disease is more advanced, but still affects less than 50% of glomeruli. Haematuria and proteinuria is almost always seen, and nephrotic syndrome, hypertension and elevated creatinine may be present. Electron microscopy shows immune deposits in the subendothelial space of the glomerular capillary wall and the mesangium. Prognosis is variable.

Focal proliferative glomerulonephritis is the most common and severe form of lupus nephritis. Haematuria and proteinuria are almost always present, and nephrotic syndrome, hypertension and renal impairment common. Biopsies demonstrate profuse deposits of IgG within the glomeruli. Immunosuppressive therapy is required in these cases to prevent progressive to end-stage renal failure.

Patients with membranous lupus nephritis tend to present with nephrotic syndrome. Microscopic haematuria and hypertension may also be seen. Biopsies show diffuse thickening of the glomerular capillary wall. Progression is variable, and immunosuppression is not always needed.

With regard to the management of lupus nephritis a biopsy is indicated in those patients with abnormal urinalysis and/or reduced renal function. This can provide a histological classification as well as information regarding activity, chronicity and prognosis. Cyclophosphamide,

mycophenolate mofetil and azathioprine reduce mortality in proliferative forms of lupus glomerulonephritis.

IgA nephropathy is a form of glomerulonephritis characterised by the deposition of IgA in the glomeruli. It is a very rare lesion in SLE.

AA amyloidosis is a systemic disorder characterised by extracellular tissue deposition of fibrils that are composed of amyloid A protein (an acute-phase protein produced by hepatocytes). It occurs in the course of chronic inflammatory disease, but an association with SLE is very unusual.

Focal segmental glomerulosclerosis is one of the most common glomerular diseases to result in end stage renal failure. It may occur as a primary condition, or in association with a number of vasculitic disorders (rarely SLE).

Minimal change nephropathy is classically a diagnosis of childhood. There is diffuse loss of podocyte foot processes, which results in nephrotic syndrome but not usually the other features described above.



[Q: 3330] OnExamination 2012 - Rheumatology

A 43-year-old female presented with a week's history of pain and stiffness in her shoulders and wrists which was worse in the mornings.

On examination, there was synovitis of both wrists. There was no proximal muscle tenderness or weakness. Her erythrocyte sedimentation rate (ESR) was 50 mm/hr (0 - 20).

What is the most likely diagnosis?

- 1- Polymyalgia rheumatica (PMR)
- 2- Polymyositis
- 3- Reactive arthritis
- 4- Rheumatoid arthritis
- 5- Systemic lupus erythematosus

Answer & Comments

Answer: 4- Rheumatoid arthritis

This is a slightly difficult question, but you may experience similar during the exam. It tests your ability to consider epidemiology as well as your knowledge of disease presentations.

In this middle aged female, the acute bilateral arthritis of shoulders and wrists together with synovitis and raised ESR are highly suggestive of acute rheumatoid arthritis. The features given do not fully satisfy the ACR criteria (see the reference for updated guidelines), but it is not unusual for this to be the case in clinical practice.

Weakness and myalgia would be expected with polymyositis and a rash would be expected with systemic lupus erythematosus with less evidence of a synovitis.

There is no prior precipitant to suggest a reactive arthritis, although it is important to consider this diagnosis in young patients.

PMR would be less likely in this age group as it usually occurs in patients over 50 years of age

Proximal weakness in the morning with the gel phenomenon would be expected, and synovitis in the wrists would be less likely in PMR.

Reference:

2010 Rheumatoid Arthritis Classification Criteria. Aletaha D et al. *Arthritis & Rheumatism*. 2010 Sept;62(9):2569-2581



[Q: 3331] OnExamination 2012 - Rheumatology

A man in his 20s begins to note persistent lower back pain and stiffness that diminishes with activity.

In his 30s he also develops hip and shoulder arthritis and in his 40s he is bothered by decreased lumbar spine mobility.

He has no other major medical problems.

For which of the following are these findings most typical?

- 1- Ankylosing spondylitis
- 2- Calcium pyrophosphate dihydrate deposition disease
- 3- Lyme disease
- 4- Osteoarthritis
- 5- Rheumatoid arthritis

Answer & Comments

Answer: 1- Ankylosing spondylitis

The combination of lower back pain, stiffness and reduced spinal mobility makes ankylosing spondylitis the most likely diagnosis here.

Ankylosing spondylitis (AS) is a chronic, potentially disabling, form of seronegative spondyloarthropathy which primarily involves the axial skeleton. The aetiology is not clearly understood, but it involves the interaction of genetic and environmental factors. The pathology mainly affects the entheses, where ligaments, tendons and capsules are attached to the bone.

Current British Society for Rheumatology recommendations state that the modified New York criteria should be used to diagnose ankylosing spondylitis:

Clinical criteria

Low back pain, present for more than three months, improved by exercise but not relieved by rest

Limitation of lumbar spine motion in both the sagittal and frontal planes

Limitation of chest expansion relative to normal values for age and sex.

Radiological criteria

Sacroiliitis on x-ray.

Diagnosis

Definite AS if the radiological criterion is present plus at least one clinical criterion

Probable AS if three clinical criteria are present alone or if the radiological criterion is present but no clinical criteria are present.

It is widely accepted that making the diagnosis early is difficult because the onset is insidious, and there is no definitive diagnostic test. One study has stated that the average time from onset to diagnosis ranges from 3-11 years. Timely diagnosis therefore requires a high index of suspicion.

HLA-B27 is found in 90% patients with AS but also in 8% of the general population and therefore should not be relied upon in making a diagnosis.

MRI can visualise sacroiliitis in patients with typical symptoms of AS but normal radiographs, and it is evolving as the most important diagnostic imaging tool in early disease. However, as yet a diagnosis of ankylosing spondylitis cannot be made on MRI findings alone and these cases are currently termed non-radiographic axial spondyloarthritis (SpA).

Both HLA-B27 and sacroiliitis on MRI play a major role in the recently proposed Assessment of Spondylo-Arthritis International Society (ASAS) diagnostic algorithm. This may replace the modified New York criteria in the future.

An x ray of the lumbar spine may show bridging syndesmophytes between the vertebral bodies in keeping with ankylosing spondylitis but this is not part of the diagnostic criteria, and it is a late sign.

Radiographic sacroiliitis is a requirement for patients to be eligible for anti-TNF treatment for AS. The sacroiliitis is usually bilateral and symmetrical. It progresses from blurring of the subchondral bone plate to irregular erosions of the margins of the sacroiliac joints to sclerosis, narrowing, and finally fusion.

Erosions of the sacroiliac joint are generally seen earlier in the lower portion due to its synovial lining, and on the iliac side due to the thinner cartilage covering this side of the joint.

Calcium pyrophosphate dihydrate deposition is the pathological basis of pseudogout, which typically presents as acute monoarthritis of the peripheral joints. It is not typically associated with spinal disease, and would be unusual in some one of this age.

Borrelia burgdorferi causes Lyme disease, which classically presents with fever and erythema migrans following a tick bite in an endemic area (for example, the New Forest). Without treatment, it can progress to disseminated disease with a polyarticular arthritis but persistent back pain and stiffness is not usual.

Osteoarthritis can affect the lumbar spine with similar symptoms to those described above, but is very uncommon in patients in their twenties.

Rheumatoid arthritis typically affects the small joints of the hands, and cervical spine involvement is more common than lumbar disease.



[Q: 3332] OnExamination 2012 - Rheumatology

An otherwise healthy middle-aged man with no prior medical history has had increasing back pain and right hip pain for the past 10 years. The pain is worse at the end of the day. He has bony enlargement of the distal interphalangeal joints. A radiograph of the spine reveals the presence of prominent osteophytes involving the vertebral bodies. There is sclerosis with narrowing of the joint space at the right acetabulum seen on a radiograph of the pelvis.

Which of the following pathologic processes is most likely to be taking place in this patient?

- 1- Gout
- 2- Lyme disease
- 3- Osteoarthritis
- 4- Osteomyelitis
- 5- Rheumatoid arthritis

Answer & Comments

Answer: 3- Osteoarthritis

Degenerative osteoarthritis is a common and progressive condition that becomes more frequent and symptomatic with aging. There is erosion and loss of articular cartilage.

Rheumatoid arthritis typically involves small joints of the hands and feet most severely, and there is a destructive pannus that leads to marked joint deformity.

A gouty arthritis is more likely to be accompanied by swelling, and deformity with joint destruction. The pain is not related to usage.

Osteomyelitis represents an ongoing infection that produces marked bone deformity, not just joint narrowing.

Lyme disease produces a chronic arthritis, but it is typically preceded by a deer tick bite with a skin lesion. It is much less common than osteoarthritis.



[Q: 3333] OnExamination 2012 - Rheumatology

Which of the following is a pro-inflammatory cytokine?

- 1- C reactive protein
- 2- IL-4
- 3- IL-10
- 4- Serum amyloid precursor protein
- 5- Tumour necrosis factor - alpha

Answer & Comments

Answer: 5- Tumour necrosis factor - alpha

C reactive protein and serum amyloid precursor protein are acute phase reactants.

IL-4 and IL-10 are anti-inflammatory cytokines.

TNF-alpha is a pro-inflammatory cytokine.

In inflammatory disorders such as rheumatoid arthritis, the levels of TNF-alpha are markedly elevated in inflamed joints.

Treatments directed at the inhibition of TNF-alpha such as infliximab (a monoclonal antibody against TNF-alpha) have been shown to be very effective in the treatment of rheumatoid arthritis and also effective in fistulating Crohn's disease.



[Q: 3334] OnExamination 2012 - Rheumatology

A 16-year-old girl presents with a three month history of polyarthralgia and marked early morning stiffness.

Her symptoms respond well to diclofenac but she is becoming increasingly concerned about her symptoms which appear to be progressing. She is otherwise well apart from a history of acne which is well controlled on minocycline. Her mother has severe rheumatoid arthritis.

Investigations:

ESR 50 mm/hr (0-20)

CRP 100 mg/L (<10)

Rheumatoid factor negative

ANAStrongly positive (1:1600)

Anti-dsDNA antibodies negative

IgG25 g/L (<15)

What is the most likely cause?

1- Drug-induced SLE

2- Fibromyalgia

3- Rheumatoid arthritis

4- Sero-negative spondyloarthropathy

5- Systemic lupus erythematosus (SLE)

Answer & Comments

Answer: 1- Drug-induced SLE

The history strongly suggests an inflammatory problem and the elevated erythrocyte sedimentation rate (ESR) and C reactive protein (CRP) confirm this.

Rheumatoid arthritis and connective tissue disorders such as SLE would be on the differential diagnosis.

The serology is atypical for rheumatoid arthritis and the marked elevation of the CRP would be very unusual for SLE where characteristically CRP elevation indicates underlying bacterial infection or widespread serositis.

The most likely diagnosis is drug-induced SLE.

Minocycline has been well documented as a cause of drug-induced SLE.

Characteristically, the ESR and CRP are both markedly elevated, the antinuclear antibody (ANA) is strongly positive and there is a hypergammaglobulinaemia. Anti-dsDNA antibodies are usually negative.

Symptoms usually improve following withdrawal of the drug but can take several months to resolve.



[Q: 3335] OnExamination 2012 - Rheumatology

Which of the following has the greatest specificity for Wegener's granulomatosis?

1- Atypical ANCA and positive antibodies to myeloperoxidase

2- cANCA and positive antibodies to lactoferrin

- 3- cANCA and positive antibodies to myeloperoxidase
- 4- cANCA and positive antibodies to proteinase 3
- 5- pANCA and positive antibodies to myeloperoxidase

Answer & Comments

Answer: 4- cANCA and positive antibodies to proteinase 3

Antineutrophil cytoplasmic antibodies (ANCA) are detected in two ways:

A. An indirect immunofluorescence assay to identify specific staining patterns. Serum samples are mixed with neutrophils to allow any autoantibodies present to react with the cells.

B. An enzyme linked immunosorbant assay (ELISA) to quantify the antibodies against the two common target antigens (myeloperoxidase and proteinase-3).

Several different staining patterns and antigen specificities are recognised:

Perinuclear (pANCA): fluorescence around the nucleus; 90% of antibodies which show this pattern are against myeloperoxidase (MPO)

Cytoplasmic (cANCA): a coarse, clumpy, granular cytoplasmic staining of neutrophils, which is associated with anti-proteinase-3 (PR3) antibodies in 85% of cases

Atypical pANCA: patterns of neutrophil cytoplasmic and/or perinuclear fluorescence other than the two above, which occurs when neutrophil antigens other than MPO or PR3 are the antibody target. This is seen in most cases of ulcerative colitis, and some patients with Crohn's disease, drug-induced vasculitis and rheumatoid arthritis

Negative ANCA: very little or no fluorescence.

If ANCA is positive, an additional test is performed to determine the titre of antibody

present. A serum sample is diluted in steps and each dilution tested for the presence of the antibody. The greatest dilution at which the antibody can be detected is the titre (for example, 1:64 - serum tests remain positive after being diluted 64-fold).

cANCA and specificity for the PR-3 antigen is most specific for Wegener's granulomatosis. Proteinase-3 is a neutral serine proteinase present in azurophil granules of human neutrophils. Antibodies against it may be present in isolation without a cANCA. In Wegener's, the level of PR3 antibody and ANCA titre are related to disease activity and the antibodies typically disappear when the disease is in remission.

pANCA and/or antibody to MPO are far less specific than cANCA and can be present in a range of inflammatory conditions such as microscopic polyangiitis, Churg-Strauss syndrome and Goodpasture's syndrome. MPO and pANCA may also be present in systemic lupus erythematosus (SLE), rheumatoid arthritis, Sjogren syndrome and occasionally in chronic infections.

ANCA levels can change over time and, as such, can be used to monitor disease activity and/or response to therapy.

Reference:

Prevalence and spectrum of rheumatic diseases associated with proteinase 3-antineutrophil cytoplasmic antibodies (ANCA) and myeloperoxidase-ANCA. Schonermarck et al. Rheumatology (2001) 40 (2): 178-184



[Q: 3336] OnExamination 2012 - Rheumatology

A 23-year-old teacher presents with a three week history of fever, weight loss, and erythematous nodular lesions on the shin. There is no peripheral adenopathy nor abnormal enlargement of an organ (organomegaly).

A chest x ray showed bilateral hilar adenopathy and a CT guided biopsy of the mediastinal lymph nodes was performed. This showed chronic inflammation with multiple non-caseating granulomas.

What is the most likely diagnosis?

- 1- Histoplasmosis
- 2- HIV
- 3- Lymphoma
- 4- Sarcoidosis
- 5- Tuberculosis

Answer & Comments

Answer: 4- Sarcoidosis

The presence of bilateral hilar adenopathy in someone with erythema nodosum-like lesions, fever and weight loss suggests the diagnosis of sarcoidosis.

Sarcoidosis is a multisystem granulomatous disorder that commonly presents with pulmonary involvement. It is diagnosed on the basis of clinical and radiological manifestations, which can be supported by histological demonstration of non-caseating granulomas in biopsy tissue. Bilateral hilar lymphadenopathy is a classical feature demonstrated on chest radiograph.

The aetiology of sarcoidosis is still not fully understood but may include exposure to an environmental antigen in combination with a genetic predisposition.

Traditionally pulmonary involvement is classified in to five stages based on chest radiograph findings:

Stage 0 - normal chest radiograph

Stage 1 - bilateral hilar lymphadenopathy (BHL)

Stage 2 - BHL with pulmonary infiltrates

Stage 3 - parenchymal infiltrates without hilar lymphadenopathy

Stage 4 - pulmonary fibrosis (volume loss) +/- cavitations, calcifications, bullae.

Treatment of sarcoidosis is symptomatic and the mainstay remains oral corticosteroids. These should be continued for 12 months and the dose tapered to stop within two years maximum.

There is insufficient evidence to recommend the use of immunosuppressants routinely.

Methotrexate and azathioprine can be used in refractory cases. Surgical intervention can be considered in severe cases. Cutaneous disease typically responds to oral non-steroidal anti-inflammatory treatment.

Differential diagnosis of bilateral hilar adenopathy includes

Sarcoidosis

Lymphoma

Tuberculosis

Pneumoconiosis

Berylliosis, and

Fungal diseases like histoplasmosis.

Ninety per cent of people infected with histoplasma are asymptomatic. If symptoms are present they typically commence within three to 10 days of exposure, and consist of fever, headache and malaise.

HIV has a variety of clinical manifestations often due to opportunistic infection, but it is not the most likely diagnosis in this case.

Biopsy of lymphoma would be expected to demonstrate malignant cells.

Tuberculosis is an important differential diagnosis, but histology is typically caseating granulomas.



[Q: 3337] OnExamination 2012 - Rheumatology

A 27-year-old British man presents with a two year history of progressively worsening, atraumatic lower back pain and stiffness. The pain radiates to the gluteal region bilaterally and is worse in the evenings. He reports some relief with exercise. Recently, he has also noted intermittent pains in his left shoulder and the heel of his left foot.

Clinical examination demonstrated limited spinal flexion in the sagittal and frontal planes. Left shoulder pain was reproducible with resisted abduction; there was a diminished left calf squeeze test with a tender and swollen left Achilles tendon.

Given the probable diagnosis, which of the following is likely to be positive?

- 1- Anti-CCP antibody
- 2- HLA B*2705
- 3- HLA B*2706
- 4- Gonorrhoea antigen
- 5- None of the above

Answer & Comments

Answer: 2- HLA B*2705

Learning points:

Distinguishing features of chronic inflammatory back pain

Population specific HLA association

Common differentials for ankylosing spondylitis.

This man has ankylosing spondylitis (AS).

The commonest subtype HLA associations are HLA B*2705 (Caucasians), B*2704 (Chinese, Japanese) and B*2702 (Mediterranean). The B*2706 subtype is weakly associated and commonly found in normal south east Asian individuals.

Chronic (more than three months) back pain characteristics that favour a spondyloarthritic aetiology include;

Age of onset before 40 years

Insidious onset

Amelioration with exercise

Refractory with rest

Night pain (with improvement upon arising).

His associated extra-articular manifestations include enthesitis of the Achilles and supraspinatus tendons.



[Q: 3338] OnExamination 2012 - Rheumatology

A 62-year-old lady is suffering from pain and stiffness of her shoulders and difficulty getting out of a chair.

Which of the following would support a diagnosis of polymyalgia rheumatica?

- 1- Ankle stiffness
- 2- Low grade fever
- 3- Muscle tenderness
- 4- Proximal muscle weakness
- 5- Weight gain

Answer & Comments

Answer: 2- Low grade fever

Polymyalgia rheumatica is an inflammatory disease which typically presents with pain and stiffness of the the shoulder and pelvic girdle muscles. It can have either an acute or subacute onset and is associated with a systemic inflammatory response and therefore constitutional symptoms such as fever, anorexia, weight loss and malaise.

The course of the disease is unpredictable, and 30% of patients also have giant cell arteritis. The cause is unknown, although

studies showing a cyclical incidence have led to theories regarding an infectious trigger.

Diagnosis of PMR can prove difficult, and other inflammatory conditions should be excluded. Patients are usually over 60 years, and PMR is very rarely seen in the under 50s. Muscle weakness is not a feature of PMR, but this can be difficult to assess in the presence of pain. Due to chronic inflammation, low grade fever and weight loss are often present. Weight gain is unusual, and peripheral joints are only rarely affected.

Investigations typically reveal:

Normochromic / normocytic anaemia

Raised erythrocyte sedimentation rate (ESR) often > 50 mm/hr (although this may be normal)

Raised C reactive protein (CRP).

Features of giant cell arteritis should be sought:

Headache

Visual disturbance

Transient ischaemic attacks (TIAs)

Jaw claudication and

Thickened and tender, temporal arteries.

Response to a moderate dose of steroids can be useful in confirming the diagnosis of PMR. The maximum dose of prednisolone should not exceed 20 mg once daily. Patients should report 70% improvement in symptoms within three to four weeks, and inflammatory markers should have normalised by this point.

In general, non-steroidal anti-inflammatories have little use and are associated with significant morbidity. There is little evidence for the use of steroid-sparing agents.



[Q: 3339] OnExamination 2012 - Rheumatology

A 36-year-old alcoholic has an endoscopy some 16 hours after his admission with a variceal haemorrhage. This is his second admission in six months with an upper GI bleed and he has required a 4 unit blood transfusion.

Endoscopy reveals a number of large varices, including one with adherent clot.

Which of the following is the therapy with the best evidence with respect to reducing the risk of a variceal bleed over the next few months?

- 1- High dose omeprazole
- 2- Propanolol
- 3- Sclerotherapy
- 4- Variceal banding
- 5- Vasopressin

Answer & Comments

Answer: 4- Variceal banding

The answer is option D, variceal banding.

Banding is proven to eliminate varices with fewer procedures and complications than injection sclerotherapy.

A recent trial has demonstrated that beta blockade and sclerotherapy are better than beta blockade alone in prophylaxis against bleeding.

The vasopressin analogue, terlipressin, is used to control bleeding acutely, along with somatostatin analogues.



[Q: 3340] OnExamination 2012 - Rheumatology

A 34-year-old skier comes to the Emergency department with pain and swelling over the first metacarpophalangeal joint (MCP joint) after a fall whilst practising on the dry ski slope.

On examination there is extensive swelling and bruising over the ulnar aspect of the joint.

What is he most likely to have injured?

- 1- Accessory collateral ligament
- 2- Proximal phalanx
- 3- Radial collateral ligament
- 4- Scaphoid bone
- 5- Ulnar collateral ligament

Answer & Comments

Answer: 5- Ulnar collateral ligament

The answer is option E, ulnar collateral ligament.

Skier's thumb was formerly known as gamekeeper's thumb, and it relates to injury to the base of the thumb, resulting in damage/rupture of the ulnar collateral ligament. Once acute swelling has subsided then gross instability of the thumb may result.

Where a complete tear of the ligament is suspected MRI may be valuable in confirming the diagnosis as surgical repair is required.

In cases of a partial rupture immobilisation in a thumb spica is the standard therapy.



[Q: 3341] OnExamination 2012 - Rheumatology

A 24-year-old woman who is known to suffer from mitral valve prolapse comes to the emergency department complaining of sudden, terrible, tearing pain between her shoulder blades. She notes that her mother died suddenly when she was aged 38.

On examination her BP is 166/94 mmHg, her pulse is 95 and regular. Her chest is clear. Her skin seems rather thin and pale white, you can see extensive bruising over her shins, and her blood vessels are easily visible as you look at her arms.

She has a number of keloid scars, which appear to have occurred after relatively minor skin injuries. She is given oxygen and diamorphine for pain relief.

Investigations show

Haemoglobin 12.0 g/dl(11.5-16.5)

White cells $6.8 \times 10^9/L$ (4-11)

Platelets $180 \times 10^9/L$ (150-400)

Sodium 140 mmol/l (135-146)

Potassium 4.2 mmol/l (3.5-5)

Creatinine 90 $\mu\text{mol/l}$ (79-118)

AP chest x ray Mediastinum width 9.5 cm

ECG 3 mm inferior ST elevation

Which of the following is the most appropriate initial therapy?

- 1- Alteplase
- 2- Angioplasty
- 3- Heparin and IV nitrate
- 4- IV beta-blockade
- 5- Streptokinase

Answer & Comments

Answer: 4- IV beta-blockade

The history is highly suspicious of aortic dissection, with involvement of the right coronary artery suggesting a type A dissection.

This patient needs beta-blockade to reduce her BP and myocardial oxygen demand and investigation to confirm the diagnosis. Most emergency departments have rapid access to CT pulmonary angiogram and this is the investigation of choice.

Regarding type A dissection, progression to surgery is inevitable.

The underlying clinical features are suggestive of Ehlers-Danlos syndrome which puts her at high risk of vascular rupture/dissections.



[Q: 3342] OnExamination 2012 - Rheumatology

A previously fit 47-year-old man presents with lower back pain which is shown to be a consequence of vertebral collapse due to osteoporosis.

Which of the following would be the most appropriate investigation for this patient?

- 1- Oestrogen concentration
- 2- Prolactin concentration
- 3- Prostate-specific antigen concentration
- 4- Testosterone concentration
- 5- Thyroid function tests

Answer & Comments

Answer: 4- Testosterone concentration

Osteoporosis in a young man would be unusual.

Any symptoms or features of hypogonadism or hypercalcaemia should be elicited. Hyperprolactinaemia causes hypogonadism so a testosterone concentration would be far more relevant.

Hyperthyroidism would need to be present for a considerable length of time before producing osteoporosis.

Hypogonadism often goes unnoticed.

Prostate malignancy does not cause osteoporosis.



[Q: 3343] OnExamination 2012 - Rheumatology

A 23-year-old student presents with a four month history of low back pain and buttock pain worse in the morning. This improves with activity and with over the counter ibuprofen.

There is no significant past or family history.

On examination there is restricted chest wall expansion (3 cm) and the Schober's test is

positive. Lumbar spine and pelvic radiographs are normal. Blood tests show a normal FBC, UEC and liver function tests. The CRP is 13 mg/L and the ESR is 32 mm/hr.

Which of the following is the most appropriate investigation for this patient?

- 1- 99m-Tc bone scan
- 2- HLA B-27
- 3- MRI lumbar spine
- 4- MRI sacroiliac joints
- 5- PET-CT

Answer & Comments

Answer: 4- MRI sacroiliac joints

Based on the presence of back pain, raised inflammatory markers and reduced spinal mobility, this patient has ankylosing spondylitis (AS).

Ankylosing spondylitis (AS) is a chronic, potentially disabling, form of seronegative spondyloarthropathy which primarily involves the axial skeleton. The aetiology is not clearly understood, but it involves the interaction of genetic and environmental factors. The pathology mainly affects the entheses, where ligaments, tendons and capsules are attached to the bone.

Current British Society for Rheumatology recommendations state that the modified New York criteria should be used to diagnose ankylosing spondylitis:

Clinical criteria

Low back pain, present for more than three months, improved by exercise but not relieved by rest

Limitation of lumbar spine motion in both the sagittal and frontal planes

Limitation of chest expansion relative to normal values for age and sex

Radiological criteria

Sacroiliitis on x ray

Diagnose

Definite AS if the radiological criterion is present plus at least one clinical criterion

Probable AS if three clinical criteria are present alone or if the radiological criterion is present but no clinical criteria are present.

It is widely accepted that making the diagnosis early is difficult because the onset is insidious, and there is no definitive diagnostic test. One study has stated that the average time from onset to diagnosis ranges from three to 11 years. Timely diagnosis therefore requires a high index of suspicion.

HLA-B27 is found in 90% patients with AS but also 8% of the general population and therefore should not be relied upon in making a diagnosis.

MRI can visualise sacroiliitis in patients with typical symptoms of AS but normal radiographs, and it is evolving as the most important diagnostic imaging tool in early disease. However, as yet a diagnosis of ankylosing spondylitis cannot be made on MRI findings alone and these cases are currently termed non-radiographic axial spondyloarthritis (SpA).

Both HLA-B27 and sacroiliitis on MRI play a major role in the recently proposed Assessment of SpondyloArthritis International Society (ASAS) diagnostic algorithm. This may replace the modified New York criteria in the future.

An x ray of the lumbar spine may show bridging syndesmophytes between the vertebral bodies in keeping with ankylosing spondylitis but this is not part of the diagnostic criteria, and it is a late sign.

Radiographic sacroiliitis is a requirement for patients to be eligible for anti-TNF treatment for AS.

The sacroiliitis is usually bilateral and symmetrical. It progresses from blurring of the subchondral bone plate to irregular erosions of the margins of the sacroiliac joints to sclerosis, narrowing, and finally fusion.

Erosions of the sacroiliac joint are generally seen earlier in the lower portion due to its synovial lining, and on the iliac side due to the thinner cartilage covering this side of the joint.

As x ray is not available as an option here, MRI of the sacroiliac joints is the most appropriate answer.

PET-CT and bone scans do not have a role in the diagnosis and investigation of ankylosing spondylitis.



[Q: 3344] OnExamination 2012 - Rheumatology

A 25-year-old lady with SLE (anti-nuclear antibody positive [1:6400], anti-dsDNA antibody positive) presents with a few weeks' history of feeling generally unwell, tired, worsening malar rash, and has mild pedal oedema.

On examination, the BP is 190/100 mm Hg, and there are 3+ proteins, 3+ blood in her urine.

What is the diagnosis?

- 1- Diffuse proliferative glomerulonephritis
- 2- Membranous glomerulonephritis
- 3- Mesangial glomerulonephritis
- 4- Minimal change glomerulonephritis
- 5- Nephrotic syndrome

Answer & Comments

Answer: 1- Diffuse proliferative glomerulonephritis

Hypertension, pedal oedema, nephritic urinary sediments (blood and protein positive) in a patient with systemic lupus

erythematosus (SLE) suggests the diagnosis of class IV (diffuse proliferative glomerulonephritis) or class III (focal segmental glomerulonephritis) lupus nephritis. ds-DNA antibodies increase the risk of lupus nephritis.

Mesangial glomerulonephritis presents with mild proteinuria.

Minimal change, or membranous glomerulonephritis present with proteinuria, which may be in the nephrotic range.

The renal manifestations of SLE are highly variable, ranging from mild asymptomatic proteinuria and/or haematuria to rapidly progressive uraemia. The various presentations are difficult to classify into clinical syndromes and histological classes. Although lupus nephritis affects a third of patients early in the disease it is frequently unrecognised until nephritic and/or nephrotic syndrome with renal failure occur.

Histologically, a number of different types of renal disease are recognised in SLE, with immune-complex mediated glomerular disease being the most common.

The standard classification divides these into five different patterns:

I - No disease

II - Mesangial

III - Focal proliferative

IV - Diffuse proliferative

V - Membranous.

Mesangial nephritis represents the earliest and mildest form of glomerular involvement. It presents clinically as microscopic haematuria and/or proteinuria. Hypertension is uncommon and nephrotic syndrome and renal impairment are very rarely seen. Biopsy demonstrates segmental areas of increased mesangial matrix and cellularity. The

prognosis is good and specific treatment is indicated only if the disease progresses.

Focal proliferative disease is more advanced, but still affects less than 50% of glomeruli. Haematuria and proteinuria is almost always seen, and nephrotic syndrome, hypertension and elevated creatinine may be present. Electron microscopy shows immune deposits in the subendothelial space of the glomerular capillary wall and the mesangium. Prognosis is variable.

Diffuse proliferative glomerulonephritis is the most common and severe form of lupus nephritis. Haematuria and proteinuria are almost always present, and nephrotic syndrome, hypertension and renal impairment common. Biopsies demonstrate profuse deposits of IgG within the glomeruli. Immunosuppressive therapy is required in these cases to prevent progression to end-stage renal failure.

Patients with membranous lupus nephritis tend to present with nephrotic syndrome. Microscopic haematuria and hypertension may also be seen. Biopsies show diffuse thickening of the glomerular capillary wall. Progression is variable, and immunosuppression is not always needed.

With regard to the management of lupus nephritis a biopsy is indicated in those patients with abnormal urinalysis and/or reduced renal function. This can provide a histological classification as well as information regarding activity, chronicity and prognosis.

Cyclophosphamide, mycophenolate mofetil and azathioprine reduce mortality in proliferative forms of lupus glomerulonephritis.



[Q: 3345] OnExamination 2012 - Rheumatology

A 25-year-old woman with Sjogren's syndrome (dry eyes, dry mouth, anti-Ro/La positive) is 32 weeks pregnant.

Which of the following is a risk to the fetus?

- 1- Complete heart block
- 2- Congestive cardiac failure (CCF)
- 3- Hydrops fetalis
- 4- Neonatal lupus
- 5- All of the above

Answer & Comments

Answer: 5- All of the above

Anti-Ro, and anti-La antibodies cross the placenta, and cause fetal AV nodal conduction defect, which may progress to complete heart block. This may be complicated by CCF, and hydrops fetalis.

Neonatal lupus presents as erythematous macular rash on face or trunk, which may be photosensitive.

Permanent pacemaker is required for the treatment of complete heart block.

On the other hand, neonatal lupus is a transient self-resolving illness due to passively transmitted maternal antibodies.



[Q: 3346] OnExamination 2012 - Rheumatology

A 45-year-old man with poorly controlled diabetes presents with a painful swollen right knee and difficulty in walking which he has had for one day.

He has had no recent infections, rarely drinks alcohol, and there is no significant past or family history.

On examination, his temperature is 37.8°. The right knee is warm, tender, and there is a

tense right knee effusion. Knee flexion is painful and restricted.

Which of the following is the most appropriate investigation for this patient?

- 1- Aspirate right knee
- 2- Blood culture
- 3- CRP
- 4- MRI right knee
- 5- Serum urate

Answer & Comments

Answer: 1- Aspirate right knee

Septic arthritis must be excluded in an individual with acute mono-arthritis.

Septic arthritis may be oligo- or polyarticular in the immunosuppressed, and may present without pyrexia. Joint aspiration, followed by microscopy and culture of the synovial fluid is critical to the diagnosis of septic arthritis.

Examination of joint fluid under polarised microscope may show monosodium urate (negatively birefringent) or calcium pyrophosphate (weakly positively birefringent) crystals, and lead to a diagnosis of acute gout or acute CPP crystal arthritis (pseudogout).

Knee radiograph is likely to be normal in someone with inflammatory joint symptoms of short duration.

A blood culture may be negative in over half of patients with septic arthritis, and a high CRP does not differentiate between causes of acute hot swollen joint.

Knee MRI will show a wide range of non-specific changes in this scenario, for example, effusion, synovial proliferation, bone marrow oedema, none of which is specific to septic arthritis.

There is no role for serum urate in the diagnosis of acute gout. Serum urate, a

negative acute phase reactant (like albumin), reduces during an acute illness.



[Q: 3347] OnExamination 2012 - Rheumatology

A 55-year-old woman with longstanding well controlled sero-positive rheumatoid arthritis, treated with methotrexate (20 mg/week) and folic acid 5 mg/day, presents with neck pain, gradually worsening difficulty in walking and getting up from sitting position.

On examination, the power is 4/5 in lower limbs. The knee and ankle jerks are brisk bilaterally, and the plantars are extensor.

What is the most likely cause of her symptoms?

- 1- Atlantoaxial subluxation
- 2- Cauda equina syndrome
- 3- Cervical spine disc prolapsed
- 4- Pseudobulbar palsy
- 5- Spinal stenosis

Answer & Comments

Answer: 1- Atlantoaxial subluxation

Rheumatoid arthritis is the most common inflammatory disease involving the spine. It has a predilection for the craniocervical spine.

The three different patterns of instability which can result are:

Atlantoaxial subluxation

Atlantoaxial impaction and

Subaxial subluxation.

Atlantoaxial subluxation (distance between the arch of atlas and odontoid peg >2.5 mm) may occur due to erosion of the odontoid process or due to laxity of the transverse ligament from rheumatoid pannus resulting in posterior subluxation of the odontoid. This can lead to cervical cord compression.

In some patients, exuberant rheumatoid pannus around the odontoid peg may cause cervical spine compression without atlantoaxial subluxation.

Basilar invagination, with upward migration of the odontoid peg into the foramen magnum may lead to cord compression, or to medullary compression (which may be fatal).

Although radiographic changes are seen in up to 86% of patients, the prevalence of neurological deficit is relatively low. Radiographs should be taken laterally with the neck held in flexion.

Only a minority of patients require surgical management.

Non-surgical treatment options include patient education, lifestyle modification and regular radiographic follow up.

MRI is indicated when myelopathy occurs or when plain radiographs show atlantoaxial subluxation with a posterior atlantodental interval less than 14 mm, any degree of atlantoaxial impaction or subaxial stenosis with a canal diameter less than 14 mm.

Pseudobulbar palsy results from the degeneration of corticobulbar pathways to the lower cranial nerve nuclei. It presents with dysarthria, difficulty swallowing and weakness of the muscles of mastication. It is not commonly associated with rheumatoid arthritis.

Spinal stenosis, cauda equine syndrome and a prolapsed cervical disc could all present as described here but in the setting of rheumatoid arthritis atlantoaxial subluxation is more likely.



[Q: 3348] OnExamination 2012 - Rheumatology

According to NICE guidelines, which of the following has a role in the treatment of osteoarthritis (OA)?

- 1- Acupuncture
- 2- Chondroitin sulphate
- 3- Glucosamine hydrochloride
- 4- Intra-articular hyaluronic acid
- 5- Transcutaneous electrical nerve stimulation

Answer & Comments

Answer: 5- Transcutaneous electrical nerve stimulation

NICE guidelines recommend formulating individualised management plans for patients with osteoarthritis.

Behavioural change, such as exercise, weight loss and suitable footwear should be encouraged. Comorbidities which compound the effect of osteoarthritis symptoms should be identified and their treatment optimised.

Paracetamol and/or topical NSAIDs (for knee or hand OA) should be offered before considering oral NSAIDs.

If symptoms are not controlled with the above strategies, oral NSAIDs or COX-2 inhibitors (but not etoricoxib) can be used. A proton pump inhibitor should be co-prescribed. The lowest effective dose should be prescribed for the shortest period possible. If the patient is already taking low-dose aspirin, an alternative analgesic should be considered.

Treatments which are not recommended include rubefacients, intra-articular hyaluronan, electro-acupuncture and chondroitin or glucosamine products.

Adjuvants which can be used include opioid analgesics, topical capsaicin and intra-articular corticosteroids. Application of heat or cold packs, or TENS, can be considered if other strategies are ineffective.

Manipulation and stretching can be helpful, particularly for hip osteoarthritis.

Bracing/joint supports can be used for patients with biomechanical joint pain or instability.

Patients should be referred for joint surgery if they have already been offered all of the core treatments or if they have refractory joint symptoms which have a substantial impact on their quality of life.

If there is a clear history of mechanical locking, referral for arthroscopic lavage and debridement should be considered.



[Q: 3349] OnExamination 2012 - Rheumatology

A 24-year-old woman presents to her physician with triphasic Raynaud's phenomenon.

It affects her daily activities and can be very painful. In particular, it is exacerbated when handling refrigerated items at her work in the local supermarket.

She smokes 20 cigarettes a day. An examination is unremarkable. Initial investigations show her to be antinuclear antibody (ANA) negative.

What is the best initial line of management?

- 1- Admit to hospital electively for five days of IV iloprost
- 2- Advise on lifestyle changes to reduce the frequency of the attacks, such as heated gloves, stopping smoking and liaising with her employer's occupational therapy department to change her duties avoiding the cold environments
- 3- Commence on nifedipine Retard
- 4- Sympathectomy
- 5- Refer for nail fold capillaroscopy

Answer & Comments

Answer: 2- Advise on lifestyle changes to reduce the frequency of the attacks, such as heated gloves, stopping smoking and liaising

with her employer's occupational therapy department to change her duties avoiding the cold environments

This question recognises the importance of using conservative management before embarking on potentially long term medication with risks of side effects, and the recognition of the vasospastic effect of cigarette smoking.

Regarding the options:

A. The prostaglandin iloprost is useful in the treatment of Raynaud's phenomenon and can be considered if the patient does not respond to nifedipine Retard or has developed digital ulceration or ischaemia.

C. Raynaud's phenomenon responds well to calcium channel blockers such as nifedipine but given that this lady has so many factors that can be altered in her lifestyle, such as smoking and working in a cold environment, more simple measures to change these could avoid daily medication with its side effects.

D. Digital sympathectomy should be considered as a last resort when drug therapy has failed or has not been tolerated.

E. Capillaroscopy is useful especially when serum antibodies are positive but it would not change the management at this stage.



[Q: 3350] OnExamination 2012 - Rheumatology

A 37-year-old carpenter comes to the rheumatology clinic complaining of pain going from the lateral aspect of his elbow and down his forearm, with further pain on flexion of the wrist. He has been recently working excessive overtime on a housing project.

On examination he has pain on palpation over the lateral aspect of the humerus, and on resisted dorsiflexion of the wrist.

Which of the following is the most likely diagnosis?

- 1- Carpal tunnel syndrome
- 2- Cervical nerve root entrapment
- 3- Lateral epicondylitis
- 4- Olecranon bursitis
- 5- Osteoarthritis of the elbow

Answer & Comments

Answer: 3- Lateral epicondylitis

This patient has symptoms that are consistent with tennis elbow, most probably due to excessive forearm extension as a result of his work as a carpenter.

Many will improve with rest and avoiding any movement that causes pain. Physiotherapy is the mainstay of therapy, and many patients benefit from exercises, placement of a tension band device around the elbow and use of non-steroidals.

In those who do not respond to physiotherapy, a lateral release procedure is highly effective.



[Q: 3351] OnExamination 2012 - Rheumatology

A 52-year-old woman presents with left loin pain. Past history includes hypertension and progressive cognitive decline.

On examination she is pyrexial, has livedo reticularis and a blood pressure of 180/100 mmHg. Examination of the abdomen reveals no masses but there is tenderness in the left flank.

Investigations revealed:

Haemoglobin 12.9 g/dl(11.5-16.5)

White cell count $8.7 \times 10^9/L$ (4-11)

Platelet count $83 \times 10^9/L$ (150-400)

Serum Creatinine 106 mol/l (60-110)

Urine dipstick analysis:

Blood +++

Protein +

Which one of the following tests is most likely to be positive?

- 1- Anticardiolipin antibody
- 2- Antiglomerular basement membrane antibody
- 3- Antimitochondrial antibody
- 4- Antineutrophil cytoplasmic antibody
- 5- Antistreptolysin O antibody

Answer & Comments

Answer: 1- Anticardiolipin antibody

The presence of thrombocytopenia, hypertension and livedo reticularis, make systemic lupus erythematosus (SLE) the most likely diagnosis in this case.

This presentation is likely due to renal vein thrombosis (causing flank pain with haematuria and proteinuria), highlighting the possibility of antiphospholipid syndrome (APS). Antibodies commonly associated with APS are anticardiolipin antibodies.

Antiphospholipid syndrome is a common cause of acquired thrombophilia and characterised by arterial and/or venous thrombosis and pregnancy mortality in association with circulating antiphospholipid antibodies.

These are a heterogeneous group of approximately twenty autoantibodies directed against phospholipid binding plasma proteins.

Three of the most clinically important are

The lupus anticoagulant

Anti-beta-2 glycoprotein I antibodies and

The anticardiolipin antibodies.

They can be detected either by phospholipid-dependent coagulation test for lupus anticoagulant or ELISA test for anticoagulation and anti-β2GPI antibodies.

Antibodies should be demonstrated on at least two occasions separated by 12 weeks.

Antiphospholipid syndrome may be primary, or associated with other conditions (such as systemic lupus erythematosus).

Antiglomerular basement membrane antibodies are characteristic of Goodpasture's syndrome, which presents with acute kidney injury with or without alveolar haemorrhage.

Antimitochondrial antibodies are seen in primary biliary cirrhosis, which causes fatigue, pruritis and abdominal pain, with jaundice as a late sign.

Antineutrophil cytoplasmic antibodies (ANCA) are a heterogeneous group of antibodies which are seen in a variety of vasculitides.

Antistreptolysin-O antibodies are directed against group A Streptococci, which can be associated with a variety of clinical presentations including scarlet fever.

Reference:

Antiphospholipid syndrome diagnosis: an update.
Visseaux B et al. *Ann Biol Clin (Paris)* 2001 Aug 1;69(4):411-418

Antiphospholipid antibody syndrome. Sangle NA and Smock KJ. *Arch Pathol Lab Med.* 2011 Sep;135(9):1092-1096



[Q: 3352] OnExamination 2012 - Rheumatology

A 31-year-old nurse presents with chronic pain. The pain changes from day to day, but often focuses in the lower back.

She is pale and looks unwell. She complains of waking up frequently at night, and feels unrefreshed in the morning. She also complains of intermittent constipation and diarrhoea.

Examination is essentially normal - but the patient complains of tenderness in multiple areas on palpation. Basic blood tests are normal.

What is the most likely diagnosis?

- 1- Depressive disorder
- 2- Fibromyalgia
- 3- Hypothyroidism
- 4- Schizophrenia
- 5- Somatoform disorder

Answer & Comments

Answer: 2- Fibromyalgia

Fibromyalgia is becoming a recognised medical diagnosis, and is based on the presence of pain in all four quadrants of the body, as well as tenderness in 11 of 18 anatomically defined trigger areas. The aetiology is not fully understood, but may involve hyperexcitability within the spinal cord or brainstem, altered pain perception and somatisation.

Approximately 50% of patients with fibromyalgia complain of diarrhoea and constipation, often associated with abdominal bloating. Morning fatigue is present in a large proportion of these patients, and patients often look unwell, and may appear depressed and anxious. Other features include tissue swelling, morning stiffness and sleep disorders.

Somatoform disorders are a group of psychological disorders in which a patient experiences physical symptoms despite the absence of an underlying medical condition that can fully explain their presence. The clinical picture here is too close to that of fibromyalgia to be a somatoform disorder.

Depression should be a diagnosis of exclusion, and fibromyalgia is a more likely diagnosis here. If the patient had hypothyroidism you would expect other features in the history, such as cold intolerance. Schizophrenia would not explain the clinical findings in this case.



[Q: 3353] OnExamination 2012 - Rheumatology

A 56-year-old woman presents with a six day history of sharp shooting pain radiating to her right forearm, with paraesthesia.

On examination, she has sensory loss affecting the centre of her palm and the right hand middle finger. Elbow and finger extension are weak and the triceps jerk is absent.

Which cervical spine nerve root is affected?

- 1- C5
- 2- C6
- 3- C7
- 4- C8
- 5- T1

Answer & Comments

Answer: 3- C7

This patient has cervical disc prolapse pressing on the C7 nerve root.

It is possible to identify the compressed nerve root by examining the power, sensation, reflexes in the upper lower limbs.

Root	Dermatome distribution	Myotome distribution	Tendon reflex
C4	Upper outer shoulder	Shoulder abduction	Nil
C5	Outer arm, forearm	Shoulder abduction, elbow flexion	Bicep
C6	Index and thumb	Wrist extension	Supinator
C7	Middle finger centre of palm	Finger and elbow extension	Triceps
C8	Little finger, ulnar border of hand	Wrist/finger flexion	Finger jerk



[Q: 3354] OnExamination 2012 -
Rheumatology

A 47-year-old woman presented with a history several years of dysphagia, hard calcified nodules in the fingers, and cold hands.

Examination revealed calcified nodules, sclerodactyly and facial telangiectasia.

Which one of the following antibodies is most likely to be found in the blood?

- 1- Anticardiolipin
- 2- Anticentromere
- 3- Anti-DNA antibodies
- 4- Antimitochondrial
- 5- Antimyeloperoxidase

Answer & Comments

Answer: 2- Anticentromere

This patient has features of CREST syndrome, making systemic sclerosis the most likely diagnosis.

Systemic sclerosis is a chronic autoimmune disease characterised by increased fibroblast activity and fibrosis in a number of different organ systems. Ninety to 95% of patients have positive antinuclear antibodies.

There are two major subtypes:

Limited cutaneous and

Diffuse cutaneous.

CREST syndrome is an older term for the limited cutaneous form (calcinosis, Raynauds' phenomenon, oesophageal dysmotility, sclerodactyly, telangiectasia).

Patients with systemic sclerosis can present with

Skin abnormalities

Musculoskeletal changes

Gastrointestinal complications

Pulmonary disease

Renal crisis and

Dry eyes and mouth.

A number of autoantibodies against extractable nuclear antigens can be detected in patients with systemic sclerosis. Anticentromere antibodies and antitopoisomerase I antibodies are the classic autoantibodies associated with the disease.

Anticentromere antibodies are linked with limited cutaneous involvement and isolated pulmonary hypertension, and a good prognosis, whereas antitopoisomerase I is linked with diffuse skin disease and pulmonary fibrosis and a higher mortality.

Additional autoantibodies which can be detected are antiRNA polymerase, antiU3RNP, antiKu and antiU1RNP.

Anticardiolipin antibodies are seen in antiphospholipid syndrome.

AntiDNA antibodies are associated with systemic lupus erythematosus.

Antimitochondrial antibodies are seen in primary biliary cirrhosis.

Antimyeloperoxidase antibodies are also referred to as pANCA, and can be seen in a variety of vasculitides.



[Q: 3355] OnExamination 2012 -
Rheumatology

A 30-year-old male presents with a week history of a painful right leg.

Past medical history reveals that he had erythema nodosum and recurrent oral and scrotal ulceration.

Examination reveals a diffusely swollen left leg, and acute tenderness with erythema of the right lower leg..

What is the most likely cause of his swollen leg?

- 1- Cellulitis
- 2- Lymphoedema
- 3- Pyomyositis
- 4- Ruptured popliteal (Baker's) cyst
- 5- Venous thrombosis

Answer & Comments

Answer: 5- Venous thrombosis

This man has clinical features of Behçet's syndrome.

Behçet's syndrome is a systemic vasculitis with an unknown aetiology, which affects small and large vessels (venous and arterial).

More than 60% of patients are HLA-B51, and there is an increased prevalence in the Mediterranean countries.

It is commonly associated with mucocutaneous manifestations (oro-genital ulceration, erythema nodosum), ocular disease, gastrointestinal involvement and neurological features. Venous thrombosis is a common complication, and therefore there should be a high clinical suspicion of a left sided DVT in this case. The tenderness and erythema of the right leg is most likely due to erythema nodosum.

None of the other conditions listed above are commonly associated with Behçet's syndrome.



[Q: 3356] OnExamination 2012 - Rheumatology

A 52-year-old man who has a long history of chronic alcohol abuse presents with gouty tophi.

He is commenced on allopurinol but develops severe joint pains two days later.

On examination he has a temperature of 39°C, and erythematous swelling of his hands, knees and ankles.

Investigations reveal:

Urate 0.55 mmol/L (0.23-0.46)

C reactive protein 150 mg/L (<10)

Which of the following is the most likely cause for his presentation?

- 1- Acute pyrophosphate arthropathy
- 2- Acute rheumatoid arthritis
- 3- Allopurinol allergy
- 4- Septic arthritis
- 5- Treatment with allopurinol

Answer & Comments

Answer: 5- Treatment with allopurinol

This man is having an acute attack of gout following the initiation of antihyperuricaemic (allopurinol) therapy.

This can be minimised by not starting allopurinol immediately during or shortly after an acute attack of gout, abstaining from alcohol bingeing and gradually increasing the dose of allopurinol.

Alcohol ingestion may also trigger an acute attack of gout, but in this case given the recent commencement of allopurinol, this is more likely to be the trigger.

The most common features of allopurinol hypersensitivity are rash and fever.

Joint sepsis affecting multiple joints is unlikely.

Acute pseudogout (pyrophosphate arthropathy) presents with inflammation of the larger joints, the knees being most commonly affected.

Given the history of alcohol abuse, gouty tophi and raised urate rheumatoid arthritis is not the most likely explanation.



[Q: 3357] OnExamination 2012 - Rheumatology

A 50-year-old woman complains of arthritis

and swelling of approximately four months duration.

On examination she has a symmetrical inflammation with painful movements of the hands and feet and also swelling of both knees suggesting a diagnosis of rheumatoid arthritis.

Regarding her joint disease which of the following suggest an adverse prognosis?

- 1- Acuteness of presentation
- 2- Articular erosions on x ray
- 3- Elevated C reactive protein
- 4- Enthesitis
- 5- Sero-negative for rheumatoid factor

Answer & Comments

Answer: 2- Articular erosions on x ray

Articular erosions in rheumatoid arthritis occurring early on in the course of the disease especially within the first six months of presentation indicate a poor prognosis. Over time joint damage will relate to disability.

A positive rheumatoid factor is associated with:

More severe erosive disease

Extra-articular manifestations including subcutaneous nodules and

Increased mortality.

An acute onset of presentation is not a poor prognostic factor.

Raised inflammatory markers (C reactive protein [CRP], erythrocyte sedimentation rate [ESR]) and the duration of the early morning stiffness both correlate with disease activity.



[Q: 3358] OnExamination 2012 - Rheumatology

A 60-year-old woman attends the casualty department with a six week history of

lethargy, neck pain, weakness in the upper limbs and gait disturbance. She describes occasional episodes of electrical sensation shooting down her spine on flexing her neck.

She has a long history of lower back pain, primary generalised osteoarthritis, and vitiligo. She takes Voltarol regularly. She neither smokes nor drinks.

She is of Pakistani origin and has been in this country for the past six years. There is no history of recent foreign travel.

On examination she is afebrile. General examination is unremarkable except for vitiligo. Examination of the cranial nerves is normal. There is no wasting of the limbs but there are a few fasciculations in brachioradialis and biceps on the right. Tone is mildly increased. Apart from mild weakness of elbow, wrist and finger flexion and extension, more marked on the right, power is normal. There is inversion of the right supinator reflex, and triceps, jerks are reduced bilaterally. Sensation is mildly reduced in the C5 and C6 dermatomes.

Investigations show:

Hb 11.3 g/L(11.5-16.5)

WCC $7 \times 10^9/L$ (4-11 $\times 10^9$)

Platelets $160 \times 10^9/L$ (150-400 $\times 10^9$)

Coagulation screen Normal

ESR 27 mm/h(0-30mm/1st hour)

CRP 17 mg/L(<10)

Sodium 137 mmol/l (137-144)

Potassium 4.2 mmol/l (3.5-4.9)

Urea 5.7 mmol/l (2.5-7.5)

Creatinine 87 $\mu\text{mol/l}$ (60-110)

Protein 73 g/L(61-76)

Albumin 38 g/L(37-49)

Calcium 2.23 mmol/l (2.2-2.6)

Phosphate 1.2 mmol/l (0.8-1.4)

LFTs Normal

CXR: Normal

x Ray cervical spine: Extensive osteophytes. Normal alignment.

What is the most likely diagnosis?

- 1- Degenerative cervical spondylosis
- 2- Motor neurone disease
- 3- Multiple myeloma
- 4- Polymyalgia rheumatica
- 5- Syringomyelia

Answer & Comments

Answer: 1- Degenerative cervical spondylosis

Cervical spondylosis is the most common progressive disorder of the spine, and is associated with normal aging. It results from degeneration of the intervertebral disc and facet joints in the cervical spine. Radiographic evidence of disc degeneration is present in 25% of patients younger than 40y, 50% over 40 and 85% over 60. In the majority of cases it is asymptomatic, and it is difficult to define the boundary between normal aging and the disease process. Risk factors include rugby, horse-riding and flying, all of which increase loads on the head. Both sexes are affected equally, but problems begin earlier in males.

Degenerative changes affecting the intervertebral discs, vertebrae, facet joints, and ligamentous structures encroach on the cervical spinal canal and damage the cord, especially in patients with a congenitally small canal.

Symptoms related to myelopathy and radiculopathy are caused by the formation of osteophytes, which narrow the diameter of the spinal canal at one or multiple levels. This may produce direct neurological damage or ischaemic changes and therefore lead to spinal cord disturbances. Radiculopathy is due to compression, stretching or angulation of the cervical nerve roots. Myelopathy is due to compression, ischaemia or recurring minor

trauma to the cord. Cervical spondylitic myelopathy is the most common cause of myelopathy in adults. Patients present with signs and symptoms of cervical spinal cord dysfunction with or without cervical nerve root injury. There is therefore a mixture of upper and lower motor neurone signs. These may or may not be accompanied by pain in the neck and/or upper limb, orbits or temporal regions. In addition there is often cervical stiffness, and poor balance. On examination there is limited range of movement of the cervical spine and poorly localised tenderness.

Radiculopathy causes dermatomal pain, often with accompanying changes in sensation or weakness in related muscles. The most commonly affected nerve roots are C5-7, and sensory symptoms (shooting pain, numbness, hyperaesthesia) are more common than weakness. Dural irritation can be demonstrated with the Spurling test in which radicular pain is reproduced with lateral flexion and rotation of the neck, with pressure on top of the patient's head. Reflexes are usually reduced.

The differential diagnosis is broad, and includes acute neck strain, osteomyelitis, fibromyalgia, inflammatory arthritis and osteoporosis. The diagnosis can often be made on clinical grounds, but if neurological abnormality is present appropriate investigations include MRI and electrophysiology. High signal-intensity lesions on MRI indicate a poor prognosis.

Management can be medical or surgical. Initially conservative measures such as regular activity, physiotherapy and addressing risk factors should be instigated. A cervical collar should not be used. Analgesia, anti-inflammatories and tricyclic antidepressants can be helpful. Indications for surgery include progressive neurological defects, compression of the cervical nerve root and/or spinal cord and intractable pain. Decompression improves neurologic function

in some patients and prevents worsening in others, but there are significant risks. Epidural injection can be considered where surgical intervention is not an option.

In general, progression of cervical spondylosis is slow, although 10% develop chronic neck pain.

Motor neurone disease is an important differential diagnosis of upper and lower motor neuron dysfunction in this age group. It is slightly more prevalent in men than women. However, you would expect muscular weakness to be the predominant symptom and this is only minor in the above case. Sensory disturbance is uncommon.

Myeloma can cause spinal cord and/or nerve/root compression but one would expect other features to be present such as bone pain, bleeding or bruising and symptoms of hypercalcaemia. Blood tests typically show anaemia, leucopenia and thrombocytopenia, none of which are present in this case.

Polymyalgia rheumatica is an inflammatory disorder characterised by severe bilateral pain and morning stiffness of the neck, shoulder and pelvic girdle. The ESR and CRP are markedly raised, and neurological signs are uncommon.

In syringomyelia there is a fluid-filled cavity within the central spinal cord (usually cervical). As this enlarges and expands it compresses the corticospinal and spinothalamic tracts, and later the anterior horn cells. Sensory symptoms are therefore a dominant feature. It most commonly presents in the 20s and 30s.



[Q: 3359] OnExamination 2012 - Rheumatology

Which of the following regarding infliximab is most true?

- 1- Is a monoclonal antibody to the glycoprotein IIb-IIIa receptor
- 2- Is authorised for the treatment of severe ulcerative colitis
- 3- Is licensed for the treatment of rheumatoid arthritis
- 4- It prevents relapse of Crohn's disease in patients who are in remission
- 5- Must not be used in combination with methotrexate due to increased toxicity

Answer & Comments

Answer: 3- Is licensed for the treatment of rheumatoid arthritis

Infliximab is a monoclonal antibody to tumour necrosis factor (TNF) alpha. It is recommended by NICE for adults with rheumatoid arthritis who have both the following:

- Active rheumatoid arthritis as measured by disease activity score greater than 5.1 on at least two occasions one month apart.
- Undergone trials of two disease-modifying anti-rheumatic drugs including methotrexate (unless contraindicated); defined as 6 months of therapy with 2 months at standard dose (unless toxicity has limited treatment).

Before starting therapy and throughout treatment, patients should be evaluated carefully for tuberculosis as there have been reports of the onset or reactivation of TB including miliary TB and some unusual extrapulmonary TB.

Infliximab should normally be used in combination with methotrexate and requires intravenous infusion in a hospital setting. If a patient is intolerant of methotrexate, adalimumab (humanised anti-TNF antibody) and etanercept (anti-TNF receptor antibody) are alternatives to infliximab which can be given as monotherapy. Response to treatment is assessed at 6 months, and only

continued if there is an improvement in disease activity score of 1.2 points or more. Treatment is typically initiated with the least expensive drug, and the other agents only used if there is toxicity.

In addition, infliximab has a role to play in refractory Crohn's disease. Some other monoclonal antibodies in clinical use include:

Digibind - digoxin-binding antibody for treatment of overdoses (increases clearance)

Abciximab: glycoprotein IIb/IIIa receptor (for unstable angina)

Pexelizumab: anti-C5 (complement) - anti-inflammatory: reduces myocardial infarction and death following CABG and angioplasty.



[Q: 3360] OnExamination 2012 - Rheumatology

In which of the following situations would a percutaneous needle biopsy of the kidney be most helpful and appropriate?

- 1- Fever with suspected acute pyelonephritis
- 2- Premature neonate with suspected polycystic kidney disease
- 3- Prostatic hyperplasia with suspected hydronephrosis
- 4- Suspected renal cyst
- 5- Systemic lupus erythematosus (SLE) and acute renal failure

Answer & Comments

Answer: 5- Systemic lupus erythematosus (SLE) and acute renal failure

The renal manifestations of SLE are highly variable, ranging from mild asymptomatic proteinuria and/or haematuria to rapidly progressive uraemia.

The various presentations are difficult to classify into clinical syndromes and histological classes. Although lupus nephritis affects a third of patients early in the disease

it is frequently unrecognised until nephritic and/or nephrotic syndrome with renal failure occur.

Therapy may depend upon determination of the severity and nature of the renal disease with SLE. A biopsy is indicated in those patients with abnormal urinalysis and/or reduced renal function. This can provide a histological classification as well as information regarding activity, chronicity and prognosis.

Histologically, a number of different types of renal disease are recognised in SLE, with immune-complex mediated glomerular disease being the most common.

The standard classification divides these into five different patterns:

No disease

Mesangial

Focal proliferative

Diffuse proliferative

Membranous.

Mesangial nephritis represents the earliest and mildest form of glomerular involvement. It presents clinically as microscopic haematuria and/or proteinuria. Hypertension is uncommon and nephrotic syndrome and renal impairment are very rarely seen.

Biopsy demonstrates segmental areas of increased mesangial matrix and cellularity. The prognosis is good and specific treatment is only indicated if the disease progresses. Prednisolone can be used in the presence of high anti-ds DNA, low complement and over a gram of protein in the urine.

Diffuse proliferative disease is more advanced, but still affects less than 50% of glomeruli. Haematuria and proteinuria are almost always seen, and nephrotic syndrome, hypertension and elevated creatinine may be present. Electron microscopy shows immune

deposititis in the subendothelial space of the glomerular capillary wall and the mesangium. Prognosis is variable.

Focal proliferative glomerulonephritis is the most common and severe form of lupus nephritis. Haematuria and proteinuria are almost always present, and nephrotic syndrome, hypertension and renal impairment common. Biopsies demonstrate profuse deposits of IgG within the glomeruli. Immunosuppressive therapy is required in these cases to prevent progressive to end-stage renal failure.

Patients with membranous lupus nephritis tend to present with nephrotic syndrome. Microscopic haematuria and hypertension may also be seen. Biopsies show diffuse thickening of the glomerular capillary wall. Progression is variable, and immunosuppression is not always needed.

Features associated with a poorer prognosis, and increased risk of progression to end stage renal failure include:

The presence of young age (<23)

Increased serum creatinine

Diffuse proliferative lesions (WHO classification class IV) and

A high chronicity index on renal histologic analysis.

The diagnosis of pyelonephritis is made on the basis of clinical presentation and positive urine culture, with or without ultrasound findings. Renal biopsy is rarely required.

Polycystic kidney disease is usually diagnosed with characteristic appearances on ultrasound.

Hydronephrosis associated with prostatic disease can be diagnosed on ultrasound, and biopsy is not indicated.

Renal cysts are usually found on ultrasound and CT. Tissue may be needed to differentiate

between malignant and benign cysts, but this is obtained via aspiration rather than renal parenchymal biopsy.



[Q: 3361] OnExamination 2012 - Rheumatology

Which of the following statements is true of the immunology of rheumatoid arthritis?

- 1- It is an example of an organ-specific disease.
- 2- It is likely that joint specific antigens have been sequestered during the time when immunological tolerance was being established.
- 3- Joint damage is the consequence of mast cell degranulation.
- 4- Rheumatoid factor is an antibody with reactivity to the heavy chain of IgG.
- 5- Rheumatoid factor is detected by a test utilising the patient's B lymphocytes.

Answer & Comments

Answer: 4- Rheumatoid factor is an antibody with reactivity to the heavy chain of IgG.

Rheumatoid arthritis is associated with several antibodies such as rheumatoid factor, collagen antibody, capable of reaction at sites other than the joints.

Additionally, the disease is not confined to the joints.

Damage is mediated by several means, including macrophages activated by CD4+ T cells, and by complement fixing immune complexes.

There is no evidence for the creation of joint-specific antibodies in development. All the components of the joint are present during fetal life.

The rheumatoid factor test utilises the patient's serum, to agglutinate cells coated with antibody. Rheumatoid factor (RF) is an

antibody whose specificity is directed to a domain situated within the Fc portion of IgG. The rheumatoid factor may be of IgM, IgG or IgA class.

The conventional (agglutination) test, detects only IgM RF.



[Q: 3362] OnExamination 2012 - Rheumatology

Which of the following is associated with hyperuricaemia?

- 1- Can be reduced with low dose aspirin therapy
- 2- Can be treated with uricosuric drugs even in renal failure
- 3- In primary gout is inherited in an autosomal dominant manner
- 4- Is usually due to an excess purine consumption
- 5- Occurs in association with acute lymphoblastic leukaemia

Answer & Comments

Answer: 5- Occurs in association with acute lymphoblastic leukaemia

Hyperuricaemia may be due to increased purine intake, urate production or reduced urate clearance, and is most commonly due to the latter.

Therefore it can occur in association with enhanced cell destruction, particularly leukaemias.

Primary gout has no obvious mode of inheritance, but familial juvenile gouty nephropathy is an autosomal dominantly inherited disorder.

Low dose aspirin may exacerbate gout but high dose aspirin is uricosuric.

Many of the uricosuric drugs may be detrimental in renal failure and may not be effective.



[Q: 3363] OnExamination 2012 - Rheumatology

Which one of the following diagnoses is associated with acute iritis?

- 1- Keratoconus
- 2- Lyme disease
- 3- Osteogenesis imperfecta
- 4- Psoriatic arthropathy
- 5- Refsum's disease

Answer & Comments

Answer: 4- Psoriatic arthropathy

Iritis is associated with conditions such as Reiter's, Behcet's, psoriatic arthropathy (about 20%) and inflammatory bowel disease.

A chronic iritis is rarely described in association with Lyme disease.

Osteogenesis imperfecta is associated with blue sclera.

Keratoconus, meaning "cone shaped," describes a condition in which the cornea (the clear front window of the eye) becomes thin and protrudes. This abnormal shape can cause serious distortion of visual images. It is not associated with iritis.

Refsum's disease is associated with retinitis pigmentosa.



[Q: 3364] OnExamination 2012 - Rheumatology

A 30-year-old housewife with SLE (ANA positive 1:1280, dsDNA positive, and anti-cardiolipin antibody positive on two occasions), developed a right below knee DVT.

She has no past history of arterial or venous thrombosis.

Which of the following is the most appropriate management plan for her?

- 1- Warfarin, and aspirin 75 mg/day for life

- 2- Warfarin for 3 months
- 3- Warfarin for 3 months, followed by aspirin 75 mg/day
- 4- Warfarin for 6 months, followed by aspirin 75 mg/day
- 5- Warfarin for life

Answer & Comments

Answer: 5- Warfarin for life

This patient has antiphospholipid antibody syndrome (APAS). APAS can be diagnosed

If the patient has anticardiolipin antibodies, or lupus anticoagulant on two occasions, over a period of 12 weeks

and either

Has had a thrombus or

A history of recurrent < 10 week pregnancy loss, or one pregnancy loss > 10 weeks in gestation when other causes of pregnancy loss have been excluded.

The occurrence of even a single thrombotic event in a patient with antiphospholipid syndrome warrants lifelong anticoagulation, as the risk of recurrence is 20-70%. Low molecular weight heparin should be used initially whilst loading warfarin. In general, it is recommended that the INR is maintained above 2.0, although a higher level (above 3) may be indicated for patients with recurrent thrombosis on treatment. Anticoagulation to prevent foetal loss remains controversial.



[Q: 3365] OnExamination 2012 - Rheumatology

A 70-year-old man complains of pain and stiffness in both his shoulders. He has lost one stone in the last eight weeks and complains of feeling lethargic with loss of appetite.

Investigations revealed a very high ESR (100 mm/hr), normochromic normocytic anaemia and a positive rheumatoid factor.

Which of the following is the most likely diagnosis?

- 1- Polyarteritis nodosa
- 2- Polymyalgia rheumatica
- 3- Polymyositis
- 4- Rheumatoid arthritis
- 5- SLE

Answer & Comments

Answer: 2- Polymyalgia rheumatica

Polymyalgia rheumatica is an inflammatory disease which typically presents with pain and stiffness of the the shoulder and pelvic girdle muscles. It can have either an acute or subacute onset and is associated with a systemic inflammatory response and therefore constitutional symptoms such as fever, anorexia, weight loss and malaise.

The course of the disease is unpredictable, and 30% of patients also have giant cell arteritis. The cause is unknown, although studies showing a cyclical incidence have led to theories regarding an infectious trigger. Muscle weakness is not a feature of PMR, but this can be difficult to assess in the presence of pain.

Investigations typically reveal:

Normochromic / normocytic anaemia

Raised erythrocyte sedimentation rate (ESR) often > 50 mm/hr (although this may be normal)

Raised C reactive protein (CRP).

PMR is not usually associated with an elevated rheumatoid factor, but it is important to note that this is present in 1-2% of the normal population. It is not specific for rheumatoid arthritis.

Features of giant cell arteritis should be sought:

Headache

Visual disturbance

Jaw claudication

Thickened and tender temporal arteries.

Diagnosis of PMR can prove difficult, and other inflammatory conditions should be excluded. Patients are usually over 60 years, and PMR is very rarely seen in the under 50s.

Response to a moderate dose of steroids can be useful. The maximum dose of prednisolone should not exceed 20 mg once daily. Patients should report 70% improvement in symptoms within three to four weeks, and inflammatory markers should have normalised by this point.

In general, non-steroidal anti-inflammatories have little use and are associated with significant morbidity. There is little evidence for the use of steroid-sparing agents.

Rheumatoid arthritis more commonly involves the distal joints, and there is erosive joint disease on radiography. Anti-cyclic citrullinated peptide antibodies are typically positive.

Systemic lupus erythematosus (SLE) rarely presents in elderly males, and there is usually more evidence of systemic disease (for example, renal impairment).

Polymyositis causes proximal muscle weakness in addition to pain, and creatinine kinase is typically raised.

Polyarteritis nodosa is a small vessel vasculitis which does not commonly present with isolated muscle pain and stiffness. Central and peripheral nervous system signs are often present at diagnosis.



[Q: 3366] OnExamination 2012 - Rheumatology

A 65-year-old man who has recently fractured his left femur presents with thirst, headache and lower back pain.

Blood tests reveal a haemoglobin of 8.2 and corrected calcium of 2.89. Radiographs revealed lytic lesions in the vertebrae and skull.

Which of the following is least likely to be present in this patient?

- 1- Bence Jones protein
- 2- Decreased resistance to infection
- 3- Infiltration of flat bones by plasma cells
- 4- Macroglobulinaemia
- 5- Monoclonal gammopathy

Answer & Comments

Answer: 4- Macroglobulinaemia

This gentleman presents with the classic symptoms of multiple myeloma: bone pain, pathological fracture, anaemia and hypercalcaemia (leading to thirst).

Multiple myeloma is a relatively common malignancy that is part of a spectrum of disorders ranging from monoclonal gammopathy of unknown significance (MGUS) to plasma cell leukaemias. It is characterised by a proliferation of malignant plasma cells involving more than 10% of the bone marrow, and a subsequent excess of monoclonal paraprotein. Additional presenting features include hyperviscosity (confusion, hazy vision), peripheral neuropathies, bleeding and spinal cord compression.

The four incorrect answers here are typical features of multiple myeloma.

Bones commonly affected are the flat bones of the spine, and as such lower back pain is one of the most common presenting features.

The aberrant antibodies that are produced lead to impaired humoral immunity, often compounded by leucopenia secondary to bone marrow infiltration. Patients therefore have a high prevalence of infection, especially with encapsulated organisms such as *Pneumococcus*.

Lambda light chains are secreted in the urine as Bence Jones protein. This is most accurately detected by urine protein electrophoresis. Immunofixation allows confirmation of the monoclonal nature of the light chains.

Gammopathy is a disturbance in the synthesis of immunoglobulins. Monoclonal gammopathy suggests there is a single neoplastic clone causing an excess of immunoglobulin, as is the case in multiple myeloma.

An important differential diagnosis to be aware of is monoclonal gammopathy of unknown significance (MGUS).

Macroglobulins are plasma globulins of high molecular weight. They are a central feature of Waldenstrom's macroglobulinaemia, where proliferation of lymphocytes cause an excess of IgM. This is an important differential diagnosis when multiple myeloma is suspected. Macroglobulins are not typically a feature of multiple myeloma.



[Q: 3367] OnExamination 2012 - Rheumatology

A 22-year-old boy with known hereditary angioneurotic oedema (HAO) presents with a recurrent fever, arthralgia and a rash on the face and the upper chest.

Despite treatment for his HAO, he has always been troubled by recurrent attacks and has required adrenaline on several occasions.

His C4 levels have been persistently reduced secondary to his HAO.

What is the most likely cause for his current symptoms?

- 1- Dermatomyositis
- 2- Drug rash
- 3- Psoriasis with arthropathy
- 4- Systemic lupus erythematosus (SLE)
- 5- Viral illness

Answer & Comments

Answer: 4- Systemic lupus erythematosus (SLE)

HAO is characterised by deficiency of C1 esterase inhibitor.

This leads to persistent activation of the classical complement pathway and C4 levels are frequently low secondary to activation and consumption.

If treatment fails to normalise the C4 levels and they remain persistently low, these patients are at an increased risk of developing SLE.



[Q: 3368] OnExamination 2012 - Rheumatology

A 69-year-old lady presents for follow up of her rheumatoid arthritis. She complains of only satisfactory symptomatic control, but admits to intermittently missed doses.

She has a past medical history of a perforated gastric ulcer, likely secondary to chronic alcohol abuse. She consumes approximately 45 units of alcohol per week.

A recent DXA scan is performed and demonstrates a T-score of -4.0 SD below the peak bone mineral density.

What is the best strategy for primary prevention of osteoporosis?

- 1- Alendronate
- 2- Calcium and vitamin D
- 3- Denosumab

4- Parathyroid hormone replacement

5- Raloxifene

Answer & Comments

Answer: 3- Denosumab

Learning points:

Treatment modalities for the primary prevention of osteoporosis in postmenopausal women

Risk factors for the development of osteoporosis in postmenopausal women.

This is a 69-year-old lady with two independent clinical risk factors for fracture (rheumatoid arthritis, alcohol intake greater than 4 units per day) and a correspondingly low T-score.

These factors make her eligible for primary prevention with a bisphosphonate. Bisphosphonate therapy is relatively contraindicated however, given her history of gastric ulcer perforation and ongoing alcohol abuse. More, it is doubtful that she would comply with the special instructions relating to the administration of a bisphosphonate.

For these reasons, current NICE guidance recommends denosumab, a monoclonal antibody targeted against the nuclear factor-kappa ligand (RANKL) involved in osteoclast activation.

Raloxifene is not recommended for the primary prevention of osteoporotic fragility fractures in postmenopausal women.



[Q: 3369] OnExamination 2012 - Rheumatology

A 35-year-old lady presents for follow up for a right-sided Colles' fracture. This was sustained following a slip in the kitchen at home. You are suspicious given the apparent low velocity mechanism of injury.

Which of the following measurements would correspond to a diagnosis of osteoporosis?

1- T-score -1.5

2- T-score -2.5

3- Z-score -1.5

4- Z-score -2.0

5- None of the above

Answer & Comments

Answer: 4- Z-score -2.0

Learning points:

Bone mineral density (BMD) measurement in premenopausal women

Risk factors for low BMD in premenopausal women

Definition of fragility fracture.

The scoring systems are differentiated by their reference populations:

T-scores compare the patient's bone mineral density (BMD) with that of a healthy young adult

Z-scores compare the individual's BMD with that of a population of peers.

Accordingly the T-score is validated for use in peri/post menopausal women and men aged over 50 years.

The relationship between BMD and fracture risk is not well established in premenopausal women and a Z-score is utilised instead.

This fracture is suspicious of a fragility state because it has resulted from a mechanical force equivalent to a fall from standing height, which should not ordinarily cause a fracture. This result should prompt a search for osteoporotic risk factors.



[Q: 3370] OnExamination 2012 - Rheumatology

You are reviewing a 42-year-old woman in clinic. She was diagnosed with rheumatoid arthritis last year after presenting with small hand joint synovitis and stiffness.

At that time her rheumatoid factor and anti-CCP levels were 1:20 titre and 700U/ml respectively. Unfortunately, despite 12 months on a combination of prednisolone, methotrexate and leflunomide, she still has moderate disease activity based on a DAS-28 (disease activity score) score of 3.2.

She is being considered for etanercept.

Preliminary tests demonstrate a normal chest radiograph, but positive QuantiFERON test. She is asymptomatic. Her only other medical history is multiple sclerosis.

From the following options, which is the most appropriate treatment?

- 1- Consider infliximab as an alternative
- 2- Hold etanercept until treatment is completed for active TB
- 3- None of these
- 4- Prescribe etanercept and monitor closely
- 5- Prescribe etanercept with TB prophylaxis

Answer & Comments

Answer: 3- None of these

Teaching points:

Recommendations for biologic therapy in rheumatoid arthritis (RA)

Absolute contraindications to biologic therapy

Basic disease scoring in RA.

This lady has a DAS-28 score persistently greater than 3.2 and has failed on a combination of more than two disease modifying agents, thus fulfilling the criteria

for consideration of anti-TNF (biologic) therapy.

Absolute contraindications to this therapy include

Active or latent mycobacterial infection

Patients with New York Heart Association (NYHA) grade 3 or 4 cardiac failure

Multiple sclerosis.

In addition, anti-TNF therapy should be used with caution in other demyelinating diseases including Guillain-Barre syndrome, Miller Fisher syndrome and chronic inflammatory demyelinating polyneuropathy.



[Q: 3371] OnExamination 2012 - Rheumatology

A 68-year-old woman presents with a one week history of acute onset right-sided headache, symmetrical shoulder pains and malaise. Her food intake has reduced which she attributes to a loss of appetite and aching of her jaw and tongue occurring during meals. She reports one transient episode of a curtain apparently descending over her right eye before spontaneously resolving.

Clinical examination demonstrated a tender, beaded and pulseless temporal artery. Fundoscopy revealed a swollen and pale right optic disc with haemorrhages. There was a relative afferent pupillary defect.

Her ESR measured 55 mm/Hr (0 - 30).

Which one of the following increases the likelihood of a positive temporal artery biopsy?

- 1- Arthralgia
- 2- Jaw claudication
- 3- Lethargy
- 4- Loss of appetite
- 5- Subjective fever

Answer & Comments

Answer: 2- Jaw claudication

Learning points:

- i. Clinical features of temporal arteritis (TA)
- ii. Diagnosis of TA
- iii. Significance of associated clinical features in relation to obtaining a positive diagnostic biopsy.

A 2002 meta-analysis evaluated the relationship between the clinical features of temporal arteritis (TA) and the likelihood ratio (LR) of obtaining a positive temporal artery biopsy (TAB).

It found the following historical features increased the likelihood of a positive TAB;

Jaw claudication (LR 4.2)

Diplopia (LR 3.4).

The following physical findings also increased the likelihood;

Temporal artery tenderness (LR 2.6)

Prominence (LR 4.3) and

Beading (LR 4.6).

Neuro-ophthalmic complications are closely linked with TAB positivity. The following were associated with a reduction in likelihood of TAB positivity;

Absence of temporal artery abnormality (LR 0.53)

Normal ESR (LR 0.2).

The presence of skip lesions and suboptimal sampling (for example, less than 1 cm, ideally should be more than 2 cm) are also associated with a negative TAB.



[Q: 3372] OnExamination 2012 - Rheumatology

A 75-year-old lady presents with a six week

history of shoulder and hip pain, restriction in movement, and early morning stiffness lasting for more than an hour. There is no history of weight loss and fever.

On examination, active shoulder movements are restricted globally due to pain while there is full range of shoulder movement passively. Muscle strength is normal.

Recent blood tests show:

Hb 11.1g/dl(11.5 - 16.5 g/dL)

WBC $7.8 \times 10^9/L$ ($4 - 11 \times 10^9/L$)

Neutrophils 70%(40-75%)

Platelet $270 \times 10^9/L$ ($150 - 400 \times 10^9/L$)

ESR 86 mm/hr(0 - 20 mm/1st hr)

Urea, electrolytes and creatinine Normal

CRP 43 mg/L(< 10 mg/L)

Rheumatoid factor negative

What is the diagnosis?

- 1- Frozen shoulder
- 2- Polymyalgia rheumatica
- 3- RA
- 4- Rotator cuff tear
- 5- Subacromial bursitis

Answer & Comments

Answer: 2- Polymyalgia rheumatica

This patient has polymyalgia rheumatica (PMR).

PMR is an inflammatory condition that occurs in those older than 50 years, and is characterised by a fairly abrupt onset of pain, early morning stiffness, and restriction in movement.

Although not an absolute essential for diagnosis, symptoms tend to be symmetric and typically involve both shoulder and pelvic girdle musculature. There is no muscle weakness, and constitutional symptoms like fatigue and malaise may be present.

PMR does not involve distal appendicular joints, and has a dramatic response to low dose prednisolone (10-20 mg/day), with marked resolution of symptoms in two to three days.

Corticosteroid dose is tapered and may be stopped in one to two years time.

Ten per cent of patients with PMR have a normal erythrocyte sedimentation rate (ESR).

The differential diagnosis of PMR includes

Rheumatoid arthritis (RA)

Rotator cuff syndrome

Osteoarthritis (OA)

Frozen shoulder

Fibromyalgia

Myositis

Parkinson's disease and

Hypothyroidism.

In frozen shoulder there is restriction of active and passive movements in all directions.



[Q: 3373] OnExamination 2012 - Rheumatology

A 23-year-old teacher presents with an eight month history of pain and stiffness in the lower back. This is worse in the morning and improves with activity, and with ibuprofen.

There is no significant past or family history. The Schober's test is positive. Sacroiliac joint MRI shows sacroiliitis and erosions. The FBC, UEC and liver function tests are normal.

What is the next step in his management?

- 1- Anti-TNFα agents
- 2- Methotrexate
- 3- NSAIDs - regular
- 4- Pamidronate

5- Tramadol

Answer & Comments

Answer: 3- NSAIDs - regular

This patient has ankylosing spondylitis (AS), based on the history of back pain and stiffness which improves with activity.

The aim of treatment of AS is symptom control and maintenance of function. Physiotherapy is critical, and should be undertaken daily. There is limited evidence regarding any medication's ability to alter the course of disease.

Non-steroidal anti-inflammatory drugs (NSAIDs) should be started in all cases, unless contraindicated. Where symptoms are not controlled additional analgesics (for example, amitriptyline), corticosteroid injections or oral corticosteroids can be used.

Current NICE guidelines state that etanercept and adalimumab can be used in patients with severe AS:

That satisfy the modified New York criteria

Have confirmed, sustained active spinal disease over at least 12 weeks

In whom maximal conventional treatment with two or more NSAIDs has failed

Where there are no contraindications present.

Infliximab is not recommended. The evidence for the use of other disease modifying antirheumatic drugs is weak.

Surgery is occasionally useful to correct spinal or joint deformities.

In the last few years evidence for additional agents has been growing. Golimumab, and anti-TNF alpha agent, has been approved in the USA, and another (certolizumab) is under investigation. Rituximab is also being studied as a treatment.



[Q: 3374] OnExamination 2012 -
Rheumatology

A 67-year-old woman with a long history of rheumatoid arthritis comes to the clinic for review.

Her rheumatoid is poorly controlled and she is receiving regular doses of methotrexate and low dose prednisolone. Most recently she has begun to suffer from increasing pitting oedema.

On examination her BP is 145/84 mmHg and her pulse is 85. She has pitting oedema to the mid shin.

Investigations show

Haemoglobin 11.0 g/dl(11.5-16.0)

White cell count $8.3 \times 10^9/L$ (4-11)

Platelets $159 \times 10^9/L$ (150-400)

Serum Sodium 140 mmol/l (135-146)

Serum Potassium 4.4 mmol/l (3.5-5)

Creatinine 130 $\mu\text{mol/l}$ (79-118)

Serum Albumin 24 g/l (36-50)

Urine protein ++

Which of the following is the most appropriate investigation likely to elucidate the underlying diagnosis?

- 1- Liver biopsy
- 2- Rectal biopsy
- 3- Renal biopsy
- 4- Renal ultrasound scan
- 5- Skin biopsy

Answer & Comments

Answer: 2- Rectal biopsy

This patient has poorly controlled rheumatoid arthritis and her proteinuria and hypoalbuminaemia raises the possibility of systemic amyloidosis.

Secondary amyloid A (AA) amyloidosis is an important complication of rheumatoid

arthritis (RA). It is caused by extracellular accumulation of AA fibrils, derived from the acute-phase-reactant serum amyloid A protein, within various tissues and organs. It is a significant cause of increased morbidity and early death in RA. Studies have shown that deposits of AA fibrils are not uncommon in RA (~20%). Any patient with longstanding RA who develops proteinuria, or intractable diarrhoea, should be investigated for AA amyloidosis.

No blood test is diagnostic for amyloidosis. Diagnosis therefore requires a biopsy and histological examination.

In order to start treatment as early as possible, a high-sensitivity site with a safe technique should be chosen. Subcutaneous fat, spleen, adrenal, liver, labia, salivary gland and gastrointestinal tract are frequent sites of AA amyloid deposition. Non-invasive techniques, such as renal ultrasound, can be useful in assessing organ involvement, but cannot establish whether the findings are definitely related to amyloid.

Gastrointestinal (GI), rectal and subcutaneous fat biopsies are the procedures of choice. The amount of amyloid in fat is low, and therefore it is not used routinely in the UK. GI and rectal are recommended because their sensitivities are high and they can be performed as an outpatient procedure. The incidence correlates strongly with renal biopsy, but the procedure is associated with much lower risk.

The progression of amyloidosis associated with systemic inflammatory disorders is slowed by better control of the underlying condition; as such in this case she should be sent for rheumatology review to determine the most appropriate way to step up her rheumatoid arthritis therapy.



[Q: 3375] OnExamination 2012 -
Rheumatology

A 29-year-old man presents with a painful

swollen right knee one month after an episode of gastroenteritis.

There is no personal or family history of chronic skin diseases and he drinks alcohol occasionally.

On examination there is a right knee effusion, and the knee aspirate shows plenty of leucocytes, no crystals, and no organisms on Gram stain or culture.

What is the next step in his management?

- 1- Commence disease modifying antirheumatic drug (DMARD)
- 2- Intra-articular corticosteroids
- 3- Oral antibiotics for five days
- 4- Oral antibiotics for six weeks
- 5- Oral NSAIDs

Answer & Comments

Answer: 5- Oral NSAIDs

Reactive arthritis (previously known as Reiter's syndrome) is the classic triad of conjunctivitis, urethritis and arthritis which occurs one to three months after an initiating infection.

It commonly occurs following:

Urethritis (C. trachomatis)

Diarrhoea (C. jejuni, Salmonella species)

Upper respiratory tract infections (β -haemolytic streptococcus).

Dermatological manifestations are common, including keratoderma blennorrhagicum, circinate balanitis, nail changes and oral lesions. It is more common in men, and the pathophysiology is not yet fully understood.

In the acute phase, affected joints should be rested and effusions aspirated. Non-steroidal anti-inflammatory agents are first line treatment. Corticosteroids can be given either intra-articular or systemic, particular in

patients who are unresponsive to NSAIDs or who develop adverse effects.

Antibiotics do not change the course of reactive arthritis, even when an infective cause is identified. However, some studies show that they may help to reduce the length of arthritis, particularly if Chlamydia is the triggering infection.

Evidence for the use of disease-modifying anti-rheumatic drugs in reactive arthritis is limited. Sulfasalazine can be beneficial in resistant disease, and TNF α -blockers can be used in aggressive disease.

Typically reactive arthritis is self-limiting with resolution of symptoms within three to 12 months. However, 15% of patients develop a long term arthritis, enthesitis or spondylitis. There is a high incidence of recurrence, especially in patients who are HLA-B27 positive (triggered by infection or stress).



[Q: 3376] OnExamination 2012 - Rheumatology

According to NICE guidelines, which of the following has a role in the treatment of OA?

- 1- Acupuncture
- 2- Chondroitin sulphate
- 3- Glucosamine hydrochloride
- 4- Intra-articular hyaluronic acid
- 5- Transcutaneous electrical nerve stimulation

Answer & Comments

Answer: 5- Transcutaneous electrical nerve stimulation

Transcutaneous electrical nerve stimulation is recommended by NICE as a supplement to analgesia in osteoarthritis (OA).

According to the NICE guidelines, there is not enough consistent evidence that acupuncture, glucosamine sulphate,

chondroitin hydrochloride, and intra-articular hyaluronic acid are either clinically- or cost-effective in treatment of OA.



[Q: 3377] OnExamination 2012 - Rheumatology

A 30-year-old woman who is 12 weeks pregnant presents with a history of systemic lupus erythematosus (SLE).

With regard to SLE in pregnancy, which of the following is correct?

- 1- Fertility rates are lower in SLE than in the general population.
- 2- If anti-Ro and anti-La antibodies are negative, there is a higher risk of congenital heart block associated with SLE.
- 3- Azathioprine can be continued in pregnancy.
- 4- It is necessary to stop hydroxychloroquine if breast-feeding.
- 5- Risk of pre-eclampsia is the same as in the general population.

Answer & Comments

Answer: 3- Azathioprine can be continued in pregnancy.

A. In general, SLE does not affect the fertility of patients.

However, fertility may be adversely affected in specific subgroups of patients such as those with renal failure, cyclophosphamide treatment, very active disease or high dose corticosteroids.

B. Anti-Ro and anti-La antibodies are associated with increased risk of congenital heart block. The risk is greater with anti-Ro positivity than anti-La positivity. The risk of congenital heart block in the presence of anti-Ro may be up to 5%.

C. Stopping any unnecessary drugs is advisable in pregnancy, however use of

azathioprine, hydroxychloroquine and prednisolone in pregnancy is considered safe if these are necessary for treatment of the mother's disease.

D. Prednisolone and hydroxychloroquine may be taken whilst breast-feeding. Azathioprine, cyclophosphamide, methotrexate and cyclosporin A are contraindicated in breast-feeding mothers.

E. Risk of pre-eclampsia is increased in SLE. It may be difficult to differentiate between pre-eclampsia and renal flare of SLE, and both may coexist. Differentiating features include raised anti-dsDNA antibody, decreased complement levels (C3 and C4) and response to steroids in the case of renal flare.



[Q: 3378] OnExamination 2012 - Rheumatology

A 45-year-old man presented to casualty with a 48 hour history of bilateral swollen ankles. He is known to have a history of an acute gout episode affecting his left first MTPJ.

He had recently been travelling in Europe and returned yesterday. During his trip he had had one episode of night sweats which he put down to the possibility of having caught flu, but he did mention that he had noticed feeling less fit than previously during activities.

Clinically he had a low grade pyrexia of 37.7°C but was otherwise well. Blood results showed an elevated ESR 40 and CRP 15, FBC, renal profile and LFTs were otherwise unremarkable.

Physical examination revealed normal abdominal, chest and cardiovascular findings. There were two patches of raised rash over his knees, which were painful. There were no features of synovitis elsewhere.

Which of the following would be the most appropriate next investigation?

- 1- Ankle aspirate

- 2- Blood cultures
- 3- CXR
- 4- Serum urate
- 5- Skin biopsy

Answer & Comments

Answer: 3- CXR

This man has bilateral swollen ankles with raised erythrocyte sedimentation rate (ESR) and mildly raised C reactive protein (CRP), some constitutional symptoms and a rash suggestive of erythema nodosum. Sarcoidosis is therefore high on the list of differentials.

The typical erythema nodosum (EN) rash consists of a sudden onset of symmetrical, tender, erythematous, warm nodules and raised plaques usually located on the shins, ankles and knees. The description above should therefore lead you to consider EN.

To consider other options of swollen ankle in a patient with a straightforward background history of gout:

- A. Joint aspirate is not the next best investigation as the patient is not clinically septic and has bilateral swelling which decreases the likelihood of septic arthritis.
- B. Blood cultures are not clinically appropriate currently, as the patient is afebrile and not clinically septic.
- C. A chest x ray may show bilateral hilar lymphadenopathy to guide towards a diagnosis of sarcoidosis and is the most appropriate investigation listed here..
- D. The history is not typical of gout and urate levels will not alter treatment nor is this a diagnostic test.
- E. The results of a skin biopsy will take up to a week, and it is therefore not the most appropriate first line investigation. In general, a biopsy will only be taken if the clinical diagnosis is in doubt. If done the

histopathology will show a mostly septal panniculitis, with no vasculitis. The septa of the subcutaneous fat are thickened, and variously infiltrated by inflammatory cells that extend to the periseptal areas of the fat lobules. The composition of the inflammatory infiltrate in the septa varies with the age of the lesion¹. Miescher's radial granulomas (relatively small histiocytes radially placed around a central cleft) may be present, which are a characteristic marker of erythema nodosum².



[Q: 3379] OnExamination 2012 - Rheumatology

A 45-year-old man is referred to the outpatient clinic with a three day history of a painful swollen left knee. He drinks 34 units of alcohol per week. His mother has psoriasis.

Physical examination demonstrates nail pitting. ESR is elevated at 90 mm/hr. White cell count is normal.

What is the next most appropriate step in his management?

- 1- Commence NSAID
- 2- Joint aspiration and analysis of synovial fluid for Gram stain, microscopy and culture
- 3- Commence allopurinol
- 4- Check rheumatoid factor, anticyclic citrullinated peptide antibody and knee radiograph
- 5- Commence oral steroids and a DMARD

Answer & Comments

Answer: 2- Joint aspiration and analysis of synovial fluid for Gram stain, microscopy and culture

This man has presented with an acute onset monoarthritis.

Despite confounders in the history (alcohol use suggesting gout, nail pitting highlighting

the possibility of psoriasis) a destructive septic arthritis is a potential diagnosis and it must be excluded as a matter of urgency.

A. Whilst analgesia is appropriate, alone it risks missing a serious diagnosis.

B. Joint aspirate is the most crucial step in excluding a septic arthritis, and allows the timely commencement of surgical management and appropriate antibiotics.

C. This may be gout, but septic arthritis requires urgent orthopaedic management and you need a joint aspirate to exclude it prior to starting treatment for another condition.

D. This not a typical history of rheumatoid arthritis and waiting for immunological investigation prior to initiating treatment is not appropriate. A radiograph may be appropriate, but in the acute stages of septic arthritis it may be normal.

E. A diagnosis needs to be made prior to commencing such medications. These are used in rheumatoid arthritis which is unlikely to be the diagnosis in this case.



[Q: 3380] OnExamination 2012 - Rheumatology

A 29-year-old male smoker presents with a two week history of cough, fever and haemoptysis.

A chest x ray demonstrates diffuse alveolar infiltrates. A urine dipstick demonstrates red cell casts.

The full blood count shows:

Hb 10.8 g/dl

WCC 5.1×10^9

Plt 376×10^9

ANCA positive at titre 1 in 3600.

Which of the following is the most likely diagnosis?

1- Alport's syndrome

2- Goodpasture's syndrome

3- Polymyositis

4- Relapsing polychondritis

5- Systemic lupus erythematosus

Answer & Comments

Answer: 2- Goodpasture's syndrome

The combination of haemoptysis (with radiological findings consistent with pulmonary haemorrhage) and red cell casts in the urine (indicating glomerular bleeding) should lead you to consider a diagnosis of Goodpasture's syndrome in this case.

Goodpasture's syndrome is an important, and potentially rapidly fatal, cause of alveolar haemorrhage and rapidly progressive renal failure. It is caused by circulating antiglomerular basement membrane antibodies, and typically causes an acute glomerulonephritis. It usually presents in young men in their twenties and men and women in their sixties. Despite treatment the mortality of Goodpasture's is 11% and it has a high morbidity with 60% of patients becoming dependent on dialysis. Renal impairment is caused by a crescentic glomerulonephritis.

It frequently has an eruptive presentation in the young, with

Cough

Fever

Haemoptysis

Haematuria

Proteinuria

Red cell casts.

The pulmonary haemorrhage and glomerular bleeding can result in a drop in haemoglobin.

The most common antibody associated with Goodpasture's is anti-glomerular basement

membrane antibodies (anti-GBM). Anti-GBM antibodies are directed against the Goodpasture antigen, which is part of the non-collagenous domain of the alpha-3(4) collagen chain. However, recently it has been shown that in a significant number of patients with Goodpasture's syndrome anti-neutrophil cytoplasmic antibodies (ANCA) can coexist with anti-GBM antibodies - in one study 30% of patients had positive ANCA serology. In this setting ANCA is usually specific for p-ANCA and is directed against myeloperoxidase. In general, both antibodies can be detected at presentation. This seropositivity has been shown to have important clinical and prognostic implications, and these patients may develop extra-renal and extra-pulmonary manifestations. In addition they are more likely to have recurrent renal or pulmonary disease. Prognosis is debated with some studies saying it is more favourable in patients with positive ANCA and others showing a worse outcome in these patients.

Plasmapheresis and immunosuppression (typically with cyclophosphamide and corticosteroid) is the treatment of choice in Goodpasture's syndrome. This has been shown to reduce anti-GBM antibodies most rapidly, which results in improved morbidity and mortality. Plasmapheresis is typically given daily or on alternate days for 2-3 weeks. Response is assessed by monitoring symptoms and anti-GBM antibody titres. Cyclophosphamide and prednisolone then continues, typically for 6-9 months following remission.

Alport's syndrome is a familial nephritis which presents with haematuria, progressive renal failure, ocular abnormalities and sensorineural deafness. It is caused by mutation within the type IV collagen genes. Inheritance is variable, but the majority are X-linked dominant (85%; 15% are autosomal recessive). There is a high spontaneous mutation rate, which means 20% of patients have no family history.

Polymyositis classically presents with relatively painless progressive proximal muscle weakness. Dysphagia is common but the ocular muscles are very rarely. Diagnosis of polymyositis is confirmed by elevated muscle enzymes (creatine kinase) and typical EMG and muscle biopsy findings.

Relapsing polychondritis is characterised by recurrent episodes of inflammation of cartilaginous structures (joints, respiratory tract, ear, nose) and connective tissue (heart, eye, blood vessels, inner ear). Antibodies to type II collagen may be present.

Systemic lupus erythematosus (SLE) is a heterogeneous, inflammatory, multisystem autoimmune inflammatory disease, in which antinuclear antibodies occur. Its presentation and course are highly variable, ranging from indolent to fulminant. The triad of fever, arthralgia and rash in a woman of childbearing age should suggest the diagnosis.



[Q: 3381] OnExamination 2012 - Rheumatology

An 18-year-old male presents with a six week history of a painful swollen right knee. He had been treated for a sexually transmitted disease three months ago.

On examination there was a large effusion in the right knee. Synovial fluid analysis revealed a white cell count of $16 \times 10^9/L$ (4-11) but culture was negative.

Which one of the following organisms is the most likely cause?

- 1- Human papilloma virus
- 2- Herpes simplex
- 3- Neisseria gonorrhoeae
- 4- Treponema pallidum
- 5- Trichomonas vaginalis

Answer & Comments

Answer: 3- Neisseria gonorrhoeae

Bacteria are the most common cause of monoarthritis.

Staphylococcus aureus and gonococci are the most common causes of septic arthritis.

Neisseria gonorrhoeae typically occurs in young adults. Presentation is either as a bacteraemic form (classic triad of migratory polyarthritis, tenosynovitis, and dermatitis) which is usually polyarticular; or as in this case, a septic arthritis. The septic arthritis form presents with joint symptoms which begin within days to weeks of gonococcal infection. Gram stain is positive in 25% and culture positive in 50%.

This patient has been treated previously for a sexually acquired infection and this may be why the culture is negative.

Reactive arthritis can also result following a sexually acquired infection (usually Chlamydia trachomatis) and can result in mono- or poly-arthritis



[Q: 3382] OnExamination 2012 - Rheumatology

A 52-year-old woman with a three year history of sero-positive erosive rheumatoid arthritis has recently commenced methotrexate therapy initiated at the rheumatology clinic.

Which one of the following agents should she also be receiving in conjunction with her methotrexate?

- 1- Folic acid
- 2- Omeprazole
- 3- Thiamine
- 4- Vitamin C
- 5- Zinc supplements

Answer & Comments

Answer: 1- Folic acid

Methotrexate is a chemotherapeutic agent as well as being an immunosuppressant used as a disease-modifying antirheumatic drug (DMARD). It acts through inhibition of dehydrofolate reductase thus depleting folate concentrations.

To reduce the impact of folate deficiency a dose of 5 mg of folic acid weekly* is recommended in conjunction with methotrexate taking the agent at least two days prior to commencing the methotrexate. Its action in arthritides is not entirely understood but may relate to both anti-inflammatory as well as immunomodulation.

*Some local variations may exist regarding dose and frequency of folate therapy. Please be aware of your local guidelines.



[Q: 3383] OnExamination 2012 - Rheumatology

A 42-year-old woman presents with a six month history of dyspepsia. She has a three year history of Raynaud's phenomenon.

On examination she has telangiectasia. Her investigations reveal an ESR of 40 mm/hr (0-10) and positive anticentromere antibodies.

Which of the following is a typical late complication of this disorder?

- 1- Alopecia
- 2- Butterfly skin rash
- 3- Erosive polyarthropathy
- 4- Myositis
- 5- Pulmonary hypertension

Answer & Comments

Answer: 5- Pulmonary hypertension

The history here is suggestive of a diagnosis of systemic sclerosis.

Systemic sclerosis is a chronic autoimmune disease characterised by increased fibroblast activity and fibrosis in a number of different organ systems. 90-95% of patients have positive antinuclear antibodies. There are two major subtypes: limited cutaneous and diffuse cutaneous. CREST syndrome is an older term for the limited cutaneous form (calcinosis, Raynauds' phenomenon, oesophageal dysmotility, sclerodactyly, telangiectasia). Patients with systemic sclerosis can present with skin abnormalities, musculoskeletal changes, gastrointestinal complications, pulmonary disease, renal crisis and dry eyes and mouth. Dyspepsia, restricted distension of the gastric antrum and diffuse gastrointestinal dysmotility are frequent features. This is due both to fibrosis and muscle atrophy, and autonomic neuropathy.

Pulmonary hypertension can present in isolation in systemic sclerosis, or in association with interstitial lung disease or cardiac dysfunction. It is a frequent cause of morbidity and mortality. Despite advances in echocardiography and biomarkers, right heart catheterisation remains the diagnostic test to differentiate pulmonary veno-occlusive disease from hypertension. This is essential because pulmonary vasodilator therapy can increase mortality in veno-occlusive disease. Recent studies have investigated the use of non-invasive screening, but their use remains controversial.

Treatment options are limited, and prognosis is worse than with idiopathic pulmonary hypertension. Median survival is one year from diagnosis. Extrapulmonary disease in systemic sclerosis limit candidacy for lung transplantation. New therapies that target abnormal cellular proliferation in the pulmonary vasculature are currently under investigation.

Erosive polyarthropathy is typically present in the earlier stages of systemic sclerosis, and would not be classified as a late complication.

A malar, or butterfly, rash is classically associated with systemic lupus erythematosus. It involves the bridge of the nose, but spares the naso-labial folds. It is usually well demarcated and macular. It is not pathognomonic of SLE, and can be seen in pellagra and dermatomyositis, but again none of these would account for the symptoms described above.

Alopecia and myositis are not commonly associated with systemic sclerosis.



[Q: 3384] OnExamination 2012 - Rheumatology

A 43-year-old patient with rheumatoid arthritis is sent to the clinic with increasing shortness of breath over a 6 week period.

Lung function tests demonstrate a fall in the FEV₁, which is markedly lower than tests last taken two months ago. The residual volume (RV) is increased by two litres but the measurements of diffusion are normal. The patient is a smoker.

Which of the following is the most likely diagnosis?

- 1- Bronchiolitis obliterans
- 2- Caplan's syndrome
- 3- Chronic obstructive pulmonary disease
- 4- Atypical pneumonia
- 5- Acute interstitial pneumonitis

Answer & Comments

Answer: 1- Bronchiolitis obliterans

All of the possible options can occur in rheumatoid arthritis but a progressive and relentless fall in the forced expiratory volume in one second (FEV₁) is the most characteristic of bronchiolitis obliterans.

Bronchiolitis obliterans, with or without organising pneumonia, can be a fatal complication of rheumatoid arthritis (especially in women taking penicillamine).

Histologically there is a mural concentric narrowing of the lumina of the bronchioles. It can present as severe respiratory insufficiency, and diagnosis is best made with lung biopsy. Inflammation in the small distal airways leads to obstructive spirometry and without treatment this is relentlessly progressive. Air trapping can occur, which leads to increased lung volumes. Corticosteroids can induce a quick response and improvement in symptoms. Rheumatoid serology often worsens with the onset of bronchiolitis obliterans.

Other associations are with solid organ or bone marrow transplantation, and other connective tissue disorders.

Caplan's syndrome is the combination of rheumatoid arthritis with pneumoconiosis related to coal dust. There is a rapid development of basal peripheral nodules, which can progress to severe pulmonary fibrosis.

COPD is a possibility but it is rare for it to progress at the rate described here. The history is too long for an atypical pneumonia.

Acute interstitial pneumonitis is associated with drug-treatment of rheumatoid arthritis, in particular methotrexate.



[Q: 3385] OnExamination 2012 - Rheumatology

A 24-year-old promising athlete is diagnosed with chronic fatigue syndrome.

Which of the following treatments is indicated?

- 1- Graded exercise therapy
- 2- Group therapy
- 3- Prednisolone
- 4- Seroxat
- 5- Thyroxine

Answer & Comments

Answer: 1- Graded exercise therapy

The diagnosis and management of chronic fatigue syndrome (CFS), or myalgic encephalitis, has been reviewed by NICE (2007).

The main features which need to be present to confirm a diagnosis of fatigue are that it:

Is new in onset, persistent or recurrent and unexplained by other conditions.

Is characterised by post-exertional malaise.

Results in a substantial reduction in activity level.

Associated symptoms include:

Hypersomnia or insomnia

Muscle or joint pain without inflammation

Painful lymph nodes without lymphadenopathy

Headaches

Cognitive dysfunction.

Red flag symptoms which suggest another diagnosis include:

Significant weight loss

Inflammatory arthropathy or connective tissue disease

Localising or focal neurological signs.

The diagnosis of CFS is one of exclusion, and features must have been present for at least four months in an adult.

Clinicians should check

Full blood count (FBC)

Urea and electrolytes (U&Es)

Urinalysis

Liver function tests (LFTs)

Thyroid function

Erythrocyte sedimentation rate (ESR)

C reactive protein (CRP)

Blood glucose

Creatinine

Gluten sensitivity calcium

Creatinine kinase and

Ferritin.

Initial treatment should focus on management of symptoms, and minimising their impact on daily activities. Patients must be encouraged to continue work and studies. Any therapy should be person-centred and should aim to improve the patient's capacity to manage their symptoms.

The majority of research evidence is for cognitive behavioural therapy (CBT) and/or graded exercise therapy and these should be offered to all people with mild or moderate CFS.

In addition, patients should be given tailored sleep management advice including how to introduce rest periods into their daily routine. Relaxation techniques should be offered for the management of pain, sleep problems, stress and anxiety.

There is no research evidence to support the experience of some patients with CFS that they are more intolerant of drug treatment. In addition, there is insufficient evidence to recommend the use of complementary therapies or vitamin supplementation.

The following drugs should not be used:

Monoamine oxidase inhibitors

Glucocorticoids

Mineralocorticoids

Dexamphetamine

Thyroxine

Antivirals.

Referral to specialist CFS care should be offered within six months of presentation to people with mild CFS, within three to four months for moderate CFS and immediately for severe CFS.

If chronic pain is a predominant feature, referral to a pain management clinic should be considered. Amitriptyline should be considered for patients with poor sleep or pain.

Patients should be advised that relapses and setbacks are to be expected.

Reference:

Chronic fatigue syndrome / Myalgic encephalomyelitis (or encephalopathy). NICE Guideline CG53. Issued August 2007



[Q: 3386] OnExamination 2012 - Rheumatology

A 53-year-old woman with rheumatoid arthritis was referred with iron deficiency anaemia.

Endoscopy revealed several superficial antral erosions, with small bowel biopsy showing mild villous blunting, apoptotic bodies, occasional eosinophils and mild increase in chronic inflammatory cells. Colonoscopy was reported as normal.

What is the most likely cause of these findings?

- 1- Coeliac disease
- 2- Crohn's disease
- 3- Non-steroidal anti-inflammatory drug therapy
- 4- Small bowel lymphoma
- 5- Whipple's disease

Answer & Comments

Answer: 3- Non-steroidal anti-inflammatory drug therapy

This salient features in this patient's case revolve around the fact that she has rheumatoid arthritis (hence the requirement for NSAIDs), the iron deficiency anaemia and the superficial ulceration on endoscopy with features indicative of inflammation due to the chronic NSAID use.

Coeliac disease is associated with villous atrophy and lymphocyte infiltration.

There is no suggestion on the biopsy of lymphocyte infiltration which argues against lymphoma or coeliac.



[Q: 3387] OnExamination 2012 - Rheumatology

A 70-year-old retired sea captain develops weakness of the shoulders and hips over a four month period. He has also noticed weak finger flexors with normal strength in straightening them. He has had some difficulty swallowing liquids.

There is no past medical history, apart from a sexually transmitted disease picked up in the South Pacific some forty years before. This was treated with antibiotics and he is not sure of the diagnosis.

He smokes a pipe and drinks one or two tots of rum at the weekend.

A creatinine kinase level comes back at 120.

Which investigation is most likely to give a definite diagnosis?

- 1- Anti Jo 1 antibody titres
- 2- CT scan of the chest
- 3- EMG
- 4- Muscle biopsy with electron microscopy
- 5- 24 hour urine collection for myoglobin

Answer & Comments

Answer: 4- Muscle biopsy with electron microscopy

The diagnosis is inclusion body myositis (IBM). This is an inflammatory condition that affects the over 50s.

Proximal muscles and finger flexors are predominantly involved, but distal muscle groups may also be involved. The onset of muscle weakness in IBM is generally gradual (over months or years).

IBM occurs more frequently in men than women. Creatine kinase (CK) may be normal.

Jo 1 titres are often raised in dermatomyositis associated with lung disease.

Electromyogram (EMG) shows a similar pattern in polymyositis and IBM - small short duration motor unit arrhythmias can complicate polymyositis and dermatomyositis, but not IBM.

There is no association of IBM with malignancy.

Polymyositis and dermatomyositis show a much better response to steroids than IBM.

Biopsy in IBM shows intranuclear or cytoplasmic tubofilaments on electron microscopy.



[Q: 3388] OnExamination 2012 - Rheumatology

A 79-year-old female suffers a fracture neck of femur following a fall at home.

Investigations are normal but her x ray shows the bones to be rather 'thin'. It is assumed that she is osteoporotic and she is started on alendronate therapy.

Which of the following is correct concerning this drug?

- 1- Enhances vitamin D action on bone
- 2- Increases absorption of calcium
- 3- Increases osteoblast activity
- 4- Increases the action of oestrogen on bone
- 5- Inhibits osteoclast activity

Answer & Comments

Answer: 5- Inhibits osteoclast activity

The bisphosphonates of which alendronate is one increase bone mineralisation by inhibiting osteoclastic activity.

They have been demonstrated in numerous studies to reduce subsequent risk of fracture.



[Q: 3389] OnExamination 2012 - Rheumatology

A 45-year-old man has noted pain in his right knee for several years. There is no joint swelling. As he moves about during the day, the pain decreases.

The underlying disease process is probably which of the following?

- 1- Osteoarthritis
- 2- Osteochondroma
- 3- Osteomalacia
- 4- Osteopetrosis
- 5- Osteoporosis

Answer & Comments

Answer: 1- Osteoarthritis

Osteoarthritis is one of the most common joint diseases, and its incidence is increasing with the age and weight of the population. It presents with pain, commonly affecting the knees, hips and small joints of the hand. Pathogenesis involves the localised loss of cartilage, with remodelling of adjacent bone. The associated pain is exacerbated by exercise and relieved by rest, although in advanced disease rest and night pain can develop. There may also be joint stiffness, typically in the morning or after rest. Diagnosis is often late, and treatment is usually aimed at reducing pain and improving function rather than targeting the disease process.

Osteoporosis is characterised by progressive deterioration of bone micro-architecture, with associated decrease in bone mineral density. It is typically asymptomatic until the complicated by fracture when pain is exacerbated by movement.

Osteochondroma is a benign tumour of cartilage, which can be located about the knee. However, they commonly present in adolescence as a painless lump which grows with the bone. Pain is not a predominant symptom.

Osteomalacia is caused by a deficiency of vitamin D and presents with widespread bone pain and tenderness (especially lower back and hips), muscle weakness and lethargy,

Osteopetrosis, an uncommon inherited metabolic disorder, leads to 'brittle bones' that predispose to fractures. Isolated joint pain is not typically an associated feature.

This question tests your understanding of disease prevalence, and the relative importance of certain symptoms and signs in differentiating disease. Patients rarely present with the classical textbook descriptions of symptoms. From the options given above osteoarthritis is the MOST LIKELY diagnosis.



[Q: 3390] OnExamination 2012 - Rheumatology

Which of the following is commonly associated with psoriasis?

- 1- Angular stomatitis
- 2- Koebner phenomenon
- 3- Optic neuritis
- 4- Response to chloroquine
- 5- Scarring alopecia

Answer & Comments

Answer: 2- Koebner phenomenon

Psoriasis is a chronic relapsing inflammatory skin disorder most commonly characterised by erythematous, sharply demarcated papules and rounded plaques covered by silvery scales. Diagnosis is usually clinical, and skin biopsy is rarely required to confirm psoriasis.

New lesions often appear at sites of injury or trauma (Koebner phenomenon), which typically occurs one to two weeks after the skin has been damaged.

Psoriasis can be associated with an anterior uveitis, but optic neuritis is not a recognised complication.

Angular stomatitis describes erythema and fissuring of the skin adjacent to the angle of the mouth. The most common cause is Candida infection, but it is also associated with allergy, seborrhoeic dermatitis, vitamin B deficiencies and iron deficiency. It is not commonly described in association with psoriasis.

The scalp is often involved in psoriasis, especially in children and adolescents. Most commonly it causes a telogen effluvium, that is, the hair follicles are forced into the telogen resting stage.

It is rare for psoriasis to cause a scarring alopecia.

Up to 30% of patients with chronic plaque psoriasis may be affected by an arthropathy. This can range from mild distal interphalangeal joint involvement with nail pitting to severe arthritis mutilans.

Whilst the exact cause is unknown, psoriasis has a strong genetic basis. European populations are commonly affected, and there are two peaks of incidence at 16-22 years and 57-60 years. Males and females are equally affected.

External factors such as infection, stress and medication may exacerbate psoriasis. Some of the common medications associated with

triggering or worsening psoriasis include lithium, gold salts, β -blockers and antimalarials (including chloroquine).



[Q: 3391] OnExamination 2012 - Rheumatology

Which of the following may be responsible for an acute relapse of systemic lupus erythematosus (SLE) in a 38-year-old female?

- 1- Hydralazine therapy
- 2- Pregnancy
- 3- Progesterone only contraceptive pill
- 4- Salmeterol therapy
- 5- Winter holiday in Lapland

Answer & Comments

Answer: 2- Pregnancy

Some physiological and environmental factors affect the periods of deterioration and of remission in systemic lupus erythematosus.

These factors include hormone replacement therapy (HRT) and particularly the oral contraceptive, pregnancy and infection. It would not be expected with the progesterone only oral contraceptive.

You would expect to find virtually no sun on a winter holiday in Lapland (Arctic circle).

A number of drugs (hydralazine, procainamide, isoniazid, chlorpromazine, D-penicillamine and methyl dopa) can result in drug-induced lupus in predisposed individuals.

This can be differentiated from the idiopathic SLE on genetic and immunologic grounds.

Furthermore,

It is mild and reversible on stopping the drug

Renal disease and double stranded anti-DNA are rare (although antibodies specific for histones may be present)

The sex ratio is equal.

These drugs do not cause deterioration in patients with SLE.



[Q: 3392] OnExamination 2012 - Rheumatology

Which of the following is a recognised feature of polymyalgia rheumatica?

- 1- A peak incidence in the fourth decade of life
- 2- An association with bronchial carcinoma
- 3- Elevated serum creatine phosphokinase activity
- 4- Weakness of distal muscle groups
- 5- Weight loss

Answer & Comments

Answer: 5- Weight loss

Polymyalgia rheumatica (PMR) is an inflammatory disease which typically presents with pain and stiffness of the the shoulder and pelvic girdle muscles.

It can have either an acute or subacute onset and is associated with a systemic inflammatory response and therefore constitutional symptoms such as fever, anorexia, weight loss and malaise. Muscle weakness is not a feature of PMR, but this can be difficult to assess in the presence of pain. Due to chronic inflammation, low-grade fever and weight loss are often present. Weight gain is unusual, and peripheral joints are only rarely affected.

The course of the disease is unpredictable, and 30% of patients also have giant cell arteritis.

The cause is unknown, although studies showing a cyclical incidence have led to theories regarding an infectious trigger. Diagnosis of PMR can prove difficult, and

other inflammatory conditions should be excluded.

Patients are usually over 60 years, and PMR is very rarely seen in the under 50s.

Bronchial carcinoma can cause hypertrophic pulmonary osteoarthropathy, which shares some of the features of PMR, but is not a classic association.

Investigations typically reveal:

Normochromic / normocytic anaemia

Raised erythrocyte sedimentation rate (ESR) often > 50 mm/hr (although this may be normal)

Raised C reactive protein (CRP)

Raised creatine phosphokinase would suggest polymyositis rather than polymyalgia rheumatica.

Features of giant cell arteritis should be sought:

Headache

Visual disturbance

Jaw claudication

Thickened and tender temporal arteries.

Response to a moderate dose of steroids can be useful in confirming the diagnosis of PMR. The maximum dose of prednisolone should not exceed 20 mg once daily. Patients should report 70% improvement in symptoms within three to four weeks, and inflammatory markers should have normalised by this point.

In general, non-steroidal anti-inflammatories have little use and are associated with significant morbidity. There is little evidence for the use of steroid-sparing agents.



[Q: 3393] OnExamination 2012 - Rheumatology

An 85-year-old woman presented with

bilateral osteoarthritis of the knees. She had no history of previous gastrointestinal disease.

Which of the following is the most appropriate initial treatment for her?

- 1- Celecoxib
- 2- Dihydrocodeine
- 3- Naproxen
- 4- Paracetamol
- 5- Topical diclofenac.

Answer & Comments

Answer: 4- Paracetamol

The recommendations of the American College of Rheumatology published in Arthritis and Rheumatism 2000, recommend acetaminophen (paracetamol) together with non-pharmacological interventions (exercise, diet) as first line therapy of mild/moderate OA of hips or knees.



[Q: 3394] OnExamination 2012 - Rheumatology

A 30-year-old woman presents with a deep vein thrombosis.

Of note in her past medical history is three early miscarriages.

Investigations revealed:

Haemoglobin 12.8 g/dl (11.5-16.5)

White cell count $3.6 \times 10^9/L$ (4-11)

Platelet count $35 \times 10^9/L$ (150-400)

Select the investigation which is most likely to be abnormal.

- 1- Antiphospholipid antibodies
- 2- Homocystine concentration
- 3- Indium-labelled white cell scan
- 4- Platelet function test
- 5- Protein C concentration

Answer & Comments

Answer: 1- Antiphospholipid antibodies

The combination of thrombophilia, recurrent miscarriage, thrombocytopenia and leucopenia in this patient indicates a diagnosis of antiphospholipid syndrome, probably associated with systemic lupus erythematosus.

Antiphospholipid syndrome is a common cause of acquired thrombophilia and characterised by arterial and/or venous thrombosis and pregnancy mortality in association with circulating antiphospholipid antibodies. These are a heterogeneous group of approximately twenty autoantibodies directed against phospholipid binding plasma proteins. Three of the most clinically important are the lupus anticoagulant, anti-beta-2 glycoprotein I antibodies and the anticardiolipin antibodies. They can be detected either by phospholipid-dependent coagulation test for lupus anticoagulant or ELISA test for anticoagulation and anti-β2GPI antibodies. Antibodies should be demonstrated on at least two occasions separated by 12 weeks. Antiphospholipid syndrome may be primary, or associated with other conditions (such as systemic lupus erythematosus).

Antiphospholipid syndrome is the most important treatable cause of recurrent miscarriage, defined as the loss of three or more consecutive pregnancies. 15% of women with recurrent miscarriage have persistently positive tests for either lupus anticoagulant or anticardiolipin antibodies, compared to 2% with an uncomplicated obstetric history. In future untreated pregnancies, women with recurrent miscarriage and persistently positive anticardiolipin antibodies have a miscarriage rate of 90%. The majority of miscarriages occur between 7 and 12 weeks gestation, and foetuses are typically chromosomally normal.

It is thought the antibodies affect trophoblast invasion and placentation.

Antiphospholipid syndrome is also an important cause of early onset pre-eclampsia and intra-uterine growth restriction.

Aspirin and low-dose heparin is the treatment of choice to reduce the risk of miscarriage in confirmed antiphospholipid syndrome. This combination has been showed to lead to a 70% live birth rate in future pregnancies. Intravenous immunoglobulin can also be used.

Elevated levels of circulating homocysteine increase the risk of developing coronary artery disease, peripheral vascular disease and cerebrovascular disease but they are not commonly associated with pregnancy loss.

An indium white blood cell scan is a nuclear medicine study in which leucocytes are removed from the patient, tagged with Indium-111 and reinjected into the patient. They can then be used to localise areas of infection and inflammation, such as thrombophlebitis and osteomyelitis.

Platelet function studies measure the platelet's ability to adhere and aggregate. They are not particularly reliable or accurate, and therefore do not have a central role in clinical practice.

Protein C is one of the major inhibitors of the coagulation system. Deficiency is associated with an increased risk of venous thrombosis, but not classically an increase rate of miscarriage.

Reference:

Antiphospholipid syndrome and recurrent miscarriage. Raj RS. J Postgrad Med 2002;48(1):3-4

Antiphospholipid syndrome diagnosis: an update. Visseaux B et al. Ann Biol Clin (Paris) 2001 Aug 1;69(4):411-418

Antiphospholipid antibody syndrome. Sangle NA and Smock KJ. Arch Pathol Lab Med. 2011 Sep;135(9):1092-1096



[Q: 3395] OnExamination 2012 - Rheumatology

Which one of the following drugs works by inhibiting tumour necrosis factor -alpha (TNF α)?

- 1- Cyclosporin
- 2- Infliximab
- 3- Methotrexate
- 4- Montelukast
- 5- Sulfasalazine

Answer & Comments

Answer: 2- Infliximab

Infliximab is a chimeric monoclonal antibody which binds to TNF α , and has been shown to be of benefit in a number of conditions including rheumatoid arthritis. Two other agents also target TNF α : etanercept (human fusion protein which acts as a TNF α receptor blocker) and adalimumab (humanised form of infliximab). There is a risk of reactivation of TB, and patients should be screened for latent disease prior to starting on therapy.

Methotrexate inhibits dihydrofolate reductase and thymidylate synthesis. It can cause myelosuppression and mucositis.

Montelukast works as a leukotriene receptor antagonist and is used as add-on therapy in moderate asthma. It has been associated with Churg-Strauss-like eosinophilic vasculitis and peripheral neuropathy.

Sulphasalazine consists of a sulphonamide molecule and 5-ASA. It is used in the treatment of ulcerative colitis and also as a disease-modifying antirheumatic in rheumatoid arthritis. It can cause gastrointestinal upset, oligospermia, orange discolouration of body fluids and blood dyscrasias.



[Q: 3396] OnExamination 2012 -
Rheumatology

Which of the following most accurately describes the mechanism of action of the bisphosphonates?

- 1- Calcium resorption in the distal tubule
- 2- Fibroblast proliferation in bone marrow
- 3- Improved vascular supply to bone marrow
- 4- Inhibition of osteoclast activity
- 5- Upregulation of osteoblast activity

Answer & Comments

Answer: 4- Inhibition of osteoclast activity

The mechanism of action of farnesyl diphosphate synthase within osteoclasts. In doing this they interfere with geranylgeranylation (attachment of the lipid to regulatory proteins), which causes osteoclast inactivation. This leads to reduced bone turnover, increased bone mass and improved mineralisation.



[Q: 3397] OnExamination 2012 -
Rheumatology

A 27-year-old man presents with fever, urethritis and arthralgia. He is found to have a swollen ankle with a pustular rash on the dorsal aspect of his foot.

What is the most likely diagnosis?

- 1- Disseminated gonorrhoea
- 2- Lyme disease
- 3- Reactive arthritis
- 4- Staphylococcal arthritis
- 5- Tuberculous arthritis

Answer & Comments

Answer: 1- Disseminated gonorrhoea

The most likely cause for this acute presentation is disseminated gonorrhoea -

with a pustular rash on the dorsum of his foot, fever, urethritis and oligoarthritis.

Gonorrhoea is the second most common bacterial STI in the UK after chlamydia. It is caused by *Neisseria gonorrhoeae*, a Gram negative diplococcus. Transmission occurs by inoculation of infected secretions, with a typical incubation period of two to five days.

Primary infection is symptomatic in 90-95% of men, but only 50% of women. It typically presents with urethral or vaginal discharge, dysuria and abdominal pain. Anal and pharyngeal disease is usually asymptomatic. Spread can occur to involve the epididymis, prostate, endometrium and pelvic organs although this is rare (<10%).

Even less common is haematological dissemination, which results in skin lesions, arthralgia, arthritis and meningitis. There is an increased risk of acquiring HIV infection if you are infected with gonococcus.

Culture is the traditional first line diagnosis test, but rapid diagnosis can be undertaken using light microscopy of genital specimens to detect the bacteria.

Increasingly, nucleic acid amplification tests are used but if positive it should be followed by culture to confirm diagnosis and check antibiotic sensitivities. Treatment is with antibiotics depending on local sensitivities.

Lyme disease is caused by a tick-borne spirochaete, *Borrelia burgdorferi*. It is a multisystem inflammatory disease initially characterised by a spreading erythema migrans rash, and can disseminate to the musculoskeletal, neurological or cardiovascular system. Stages of the disease have varying manifestations, but none would fit with the description above.

Reactive arthritis, formally known as Reiter's syndrome, is an autoimmune condition that develops in response to an infection. Classically this is described as a triad of

urethritis, conjunctivitis and arthritis. Precipitating infections include gastrointestinal organisms such as Salmonella and genitourinary infections, especially Chlamydia. Skin rash as described above is not typically present.

Staphylococcus and tuberculosis are both causes of septic arthritis. Patients are often systemically unwell and urethritis would not be expected.

Reference:

National Guideline on the Diagnosis and Treatment of Gonorrhoea in Adults 2005 (pdf)
British Association for Sexual Health and HIV



[Q: 3398] OnExamination 2012 - Rheumatology

A 28-year-old man presented with acute stiffness and swelling of his knees and ankles, and a painful rash on his legs.

The erythrocyte sedimentation rate (ESR) was 86 mm in the first hour (0-15). Chest x ray showed hilar lymphadenopathy.

What is the most likely outcome?

- 1- Chronic arthritis
- 2- Pulmonary fibrosis
- 3- Renal failure
- 4- Skin ulceration
- 5- Spontaneous improvement

Answer & Comments

Answer: 5- Spontaneous improvement

The description is typical of acute sarcoidosis with erythema nodosum, polyarthropathy and hilar lymphadenopathy.

This has a good prognosis and usually resolves spontaneously over six to eight weeks.



[Q: 3399] OnExamination 2012 - Rheumatology

A 23-year-old female presents with left knee pain and a two month history of weight loss.

She has a good appetite but has had occasional episodes of diarrhoea over this time and tends to pass a loose motion at least twice daily. She is not taking any medication and there is a family history of hypothyroidism. She is a non-smoker and drinks modest quantities of alcohol.

Examination reveals a swollen, tender left knee joint with a small effusion.

Which is the most likely diagnosis?

- 1- Behcet's disease
- 2- Inflammatory bowel disease
- 3- Reactive arthritis
- 4- Thyrotoxicosis
- 5- Tuberculosis

Answer & Comments

Answer: 2- Inflammatory bowel disease

The description of weight loss, diarrhoea and a mono/oligo-arthropathy suggests a diagnosis of inflammatory bowel disease. (IBD).

IBD-associated arthropathy is considered a subtype of seronegative spondyloarthropathy. A variety of joint involvement has been described, from large joint pauciarticular arthropathy to a rheumatoid pattern polyarthropathy.

Peripheral arthritis is generally non-erosive and the oligoarticular variant particularly may correlate with intestinal disease activity.

Axial arthritis may include inflammatory back pain, sacroilitis, or ankylosing spondylitis and is less likely to correlate with gastrointestinal symptoms. Whilst there have been genetic factors identified, the mechanisms surrounding the development of arthritis in

IBD remain unclear. Treatment of the gastrointestinal disease is not always sufficient for control of arthritis, and biologic agents may be indicated.

Behcet's disease is a chronic inflammatory multisystem disorder characterised by recurrent oral and genital aphthosis and ocular involvement. Whilst arthropathy is fairly common, disturbance in bowel habit would not be expected. It is mainly present along the ancient Silk Road, from the Mediterranean to East Asia.

Reactive arthritis, formally known as Reiter's syndrome, is an autoimmune condition that develops in response to an infection. Classically this is described as a triad of urethritis, conjunctivitis and arthritis. Precipitating infections include gastrointestinal organisms such as Salmonella and genitourinary infections, especially Chlamydia.

Diarrhoea, if present, is typically more acute than is described in this scenario.

Whilst thyrotoxicosis can cause diarrhoea and arthralgia, a monoarthritis is unusual.

Tuberculous arthritis is now very rare in Europe, but can present in the spine, hip or knee. Infection is either from haematogenous spread (from lungs or intestine) or local spread (from a tuberculous focus in a neighbouring bone).



[Q: 3400] OnExamination 2012 - Rheumatology

A 64-year-old woman with a history of rheumatoid arthritis comes to the clinic for review.

She is taking weekly methotrexate to control her rheumatoid and is concerned as she has had two episodes of pneumonia over the past nine months.

On examination her BP is 122/72 mmHg, pulse is 75 and regular. There are occasional

crackles on auscultation of the chest, and evidence of active rheumatoid on examination of the small joints of the hands.

Investigations show:

Haemoglobin 11.4 g/dl(11.5-16.0)

White cell count $8.8 \times 10^9/L$ (4-11)

Platelets $182 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (135-146)

Potassium 3.9 mmol/l (3.5-5)

Creatinine 118 micromol/l (79-118)

CXR - Nodular changes, unchanged over the past two years.

Which of the following is the most appropriate management with respect to her chest disease?

- 1- Add infliximab
- 2- Add low dose prednisolone
- 3- Decrease methotrexate dose
- 4- Increase methotrexate dose
- 5- Observation

Answer & Comments

Answer: 5- Observation

Rheumatoid nodules are commonly associated with the disease. They may occasionally be associated with increased risk of respiratory tract infection. Given the appearance on chest x ray has not changed over the past two years, no intervention is required.

An increase or a decrease in antirheumatoid medication is not necessarily indicated by the presence or absence of rheumatoid nodules. They are typically benign but can lead to pleural effusion, pneumothorax, haemoptysis, secondary infection, and bronchopulmonary fistula.



[Q: 3401] OnExamination 2012 -
Rheumatology

A 66-year-old man has a painful, swollen right knee and difficulty in walking which he has had for three days.

He had two self-limiting episodes of severe pain and swelling in the right big toe in the last year.

A knee aspirate shows no organisms on Gram stain, plenty of leucocytes, and negatively birefringent crystals on polarised light microscopy. Recent blood tests show a normal renal function, and a raised serum urate 452 $\mu\text{mol/l}$ (210-415).

Once the acute attack of gout has subsided, which of the following is the most appropriate drug in his long term management?

- 1- Allopurinol
- 2- Corticosteroids
- 3- Dietary advice
- 4- Febuxostat
- 5- Ibuprofen

Answer & Comments

Answer: 1- Allopurinol

Gout is the most prevalent form of inflammatory arthropathy. It is caused by the deposition of monosodium urate crystals with resultant inflammation in the involved joint.

Allopurinol is indicated in those with

More than two episodes of acute gout in a year

Tophaceous gout

Uric acid stones or

Renal insufficiency.

Starting treatment with allopurinol leads to changes in serum uric acid levels, which can mobilise intra-articular urate crystals, thereby triggering episodes of acute gout. In order to

prevent these attacks of gout, patients starting allopurinol (or other urate lowering therapy) should be co-prescribed colchicine 500 microgram bd for six months.

If there are contraindications to colchicine, or if it is not well tolerated, they should be commenced on NSAIDs/COX 2 inhibitors for a period of six weeks. The duration of treatment with NSAIDs/COX 2 inhibitors is shorter due to a higher risk of side effects than with colchicine. However, individual patients may require a longer course of treatment.

Febuxostat is a non-purine selective inhibitor of xanthine oxidase. It is recommended in cases of allopurinol hypersensitivity or intolerance.

Oral, intramuscular or intra-articular corticosteroids are effective in the control of acute gout. Prolonged corticosteroid use has significant side effects and is not indicated in the long term management of gout.

Similarly, ibuprofen may be used to treat acute gout, but has no role in the long term management of gout.



[Q: 3402] OnExamination 2012 -
Rheumatology

A 29-year-old woman with a history of SLE gives birth to her first child. She has suffered two previous miscarriages and has been managed with low molecular weight heparin injections during her pregnancy.

The labour is uneventful, but the midwives notice that the child has an erythematous rash. He is also bradycardic with a pulse of 75.

Which of the following antibodies is most likely to be linked to the illness in the baby?

- 1- Anti-LKM
- 2- Anti-Ro/SSA
- 3- Anti-smooth muscle
- 4- c-ANCA

5- Rheumatoid factor

Answer & Comments

Answer: 2- Anti-Ro/SSA

Neonatal lupus is an uncommon condition associated with the transplacental passage of maternal anti-Ro and/or anti-La autoantibodies.

Findings may include

Cutaneous lupus lesions

Third-degree heart block

Cardiomyopathy

Hepatobiliary disease and

Cytopenias.

Typically only one organ is affected in each infant.

The most severe manifestation is the heart block, which usually begins during the second trimester of pregnancy. It is rare, occurring in only 2% of mothers with anti-Ro or anti-La antibodies. Once established this is permanent, unlike the other manifestations which are generally transient.

The rash is most frequently seen around the eyes, but also occurs in other parts of the body.

Asymptomatic elevation of liver function tests is seen in 10-25% of cases.

Overall, non-cardiac involvement is more common than cardiac.

A significant number of babies with neonatal lupus are born to mothers who are not known to have systemic lupus erythematosus.

Anti-LKM and anti-smooth muscle antibodies are associated with autoimmune hepatitis.

c-ANCA is highly specific for Wegener's granulomatosis.

Rheumatoid factor is non-specific, but is seen at increased frequency in patients with rheumatoid arthritis.

Reference:

The clinical spectrum of neonatal lupus. Lee LA. Arch Dermatol Res. 2009 Jan;301(1):107-110

Cutaneous lupus in infancy and childhood. Lee LA. Lupus. 2010 Aug;19(9):1112-1117

Non-cardiac manifestations of neonatal lupus erythematosus. Silvermann E and Jaeggi E. Scand J Immunol. 2010 Sep;72(3):223-225

Arrhythmias presenting in neonatal lupus. Brucato A et al. Scand J Immunol. 2010 Sep;72(3):198-204



[Q: 3403] OnExamination 2012 - Rheumatology

A 32-year-old woman is referred from her general practice following a presentation with shortness of breath, myalgia, arthralgia and a skin rash.

Which of the following antibodies when found in this patient is most specific for systemic lupus erythematosus (SLE)?

1- ANA

2- Anti-Ro

3- Anti-Sm

4- cANCA

5- Rheumatoid factor

Answer & Comments

Answer: 3- Anti-Sm

The presence of anti-Sm antibodies is more specific for SLE than the other options.

ANA is positive in around 95% of patients with SLE but also occur in juvenile inflammatory arthritis, chronic active hepatitis and Sjogren's syndrome.

cANCA is present in Wegener's granulomatosis and pANCA is elevated in microscopic polyangiitis - another type of vasculitis.

Rheumatoid factor is found in several autoimmune conditions including rheumatoid arthritis, Felty's syndrome, systemic sclerosis and Sjogren's syndrome.

Anti-Ro is seen in SLE and in overlap syndromes with Sjogren's disease.



[Q: 3404] OnExamination 2012 - Rheumatology

A 48-year-old female with rheumatoid arthritis has the following full blood count results:

Haemoglobin 11.4 g/dL (11.5-16.5)

Platelets $470 \times 10^9/L$ (150-400)

White cell count $9.0 \times 10^9/L$ (4-11)

MCV 102 fL(80-96)

Which drug is she likely to be taking?

- 1- Ciclosporin
- 2- Hydroxychloroquine
- 3- Leflunomide
- 4- Methotrexate
- 5- Myocrisin

Answer & Comments

Answer: 4- Methotrexate

Leflunomide is associated rarely with anaemia, thrombocytopenia and eosinophilia.

Ciclosporin may be associated with a mild anaemia.

Methotrexate may be associated with haematopoietic suppression, leading to profound and sometimes sudden leucopenia and thrombocytopenia.

Methotrexate may lead to macrocytosis as a result of B12 or folate deficiency.

Myocrisin may also rarely lead to blood disorders, pancytopenia and leucopenia.

The elevated platelet count here probably relates to the rheumatoid arthritis itself.



[Q: 3405] OnExamination 2012 - Rheumatology

A 70-year-old female who has a history of chronic anxiety presents with a three day history of severe left temporal headache radiating from the eye to the scalp. She had also experienced discomfort during eating.

Which one of the following drugs should be given to this patient while awaiting the results of diagnostic tests?

- 1- Aciclovir
- 2- Carbamazepine
- 3- Diclofenac
- 4- Prednisolone
- 5- Sumatriptan

Answer & Comments

Answer: 4- Prednisolone

The features described here are classical for giant cell arteritis (GCA).

GCA affects large and medium sized arteries, with a predilection for the external carotid, ciliary and retinal arteries. Endovascular damage and cytokine-mediated inflammation causes local ischaemia. There is considerable overlap with polymyalgia rheumatica, and symptoms of both should be sought. Twenty per cent of patients develop loss of vision, which can be prevented with timely recognition and treatment.

The classically described jaw claudication occurs in a minority of cases, but does indicate a high risk of ischaemic complications.

The typical presentation of GCA is a temporal headache, with myalgia, malaise and fever. Erythrocyte sedimentation rate (ESR) and C reactive protein (CRP) are usually raised.

Once the diagnosis is suspected, high dose corticosteroids should be given. If visual symptoms are present, intravenous methylprednisolone should be given. Once symptoms and laboratory abnormalities resolve, the dose of corticosteroid can be reduced and usually stopped within two years.

A differential diagnosis is trigeminal neuralgia, although this tends to present with paroxysms of pain which last for thirty seconds to two minutes.

Carbamazepine is the first-line treatment. However, due to the threat to a patient's sight it is most appropriate to treat first for GCA in the above scenario.

Aciclovir could be used to treat ophthalmic shingles, however in this scenario you would expect characteristic lesions in addition to pain.

Diclofenac is a non-steroidal anti-inflammatory drug which is indicated in the management of simple headache.

Serotonin is a 5-HT₁ agonist which is used for the treatment of migraines and cluster headaches. It would be unusual for these to present for the first time in a 70-year-old patient, and it would be unusual for the attacks to last as long as described above.



[Q: 3406] OnExamination 2012 - Rheumatology

A female presents with headache, lethargy and weight loss.

Which of the following would make the diagnosis of giant cell arteritis (GCA) unlikely?

- 1- A normal ESR
- 2- Bilateral headache
- 3- Non-tender temporal arteries
- 4- Papilloedema without visual loss
- 5- The patient is 50-years-old

Answer & Comments

Answer: 4- Papilloedema without visual loss

Patients are usually elderly with a typical age of 70 but not exclusively so.

The temporal arteries are usually tender but they may be non-tender.

Similarly there is usually a unilateral headache but often presents as bilateral headache.

Erythrocyte sedimentation rate (ESR) is typically elevated but a normal ESR is well recognised.

However, papilloedema without visual loss would suggest raised intracranial pressure.

One would expect visual loss with anterior ischaemic optic neuropathy in GCA.



[Q: 3407] OnExamination 2012 - Rheumatology

An 81-year-old female presents with bilaterally painful knees. There was no history of gastrointestinal diseases. On examination she had crepitus but had a full range of movement of both knees.

Which one of the following is the most appropriate initial treatment for her painful knees?

- 1- Celecoxib
- 2- Dihydrocodeine
- 3- Naproxen
- 4- Paracetamol
- 5- Topical diclofenac

Answer & Comments

Answer: 4- Paracetamol

This woman has osteoarthritis (OA) of the knees.

The principal goal of systemic therapy is to provide the most effective pain relief with the

least associated toxicity. Paracetamol is the initial therapy recommended for the treatment of OA of the hip and knee. Studies have shown that the short term and long term efficacy of paracetamol is comparable with that of ibuprofen and naproxen in people with knee osteoarthritis.

Specific COX-2 inhibitors such as celecoxib have clinical benefit similar to that of traditional non-steroidal anti-inflammatory drugs (NSAIDs), but less gastrointestinal (GI) toxicity although issues remain regarding their cardiovascular risk. They may be used in patients with GI intolerance of traditional NSAIDs.



[Q: 3408] OnExamination 2012 - Rheumatology

A 45-year-old woman notices that she develops tingling and numbness over the palmar surface of her thumb, index, and middle fingers after several hours at her computer workstation doing word processing. Pain in the same area often occurs at night as well.

Which of the following pathologic findings most likely accounts for her symptoms?

- 1- Gout
- 2- Hypertrophic osteoarthropathy
- 3- Entrapment neuropathy
- 4- Rheumatoid arthritis
- 5- Toxic peripheral neuropathy

Answer & Comments

Answer: 3- Entrapment neuropathy

Carpal tunnel syndrome is one of the most common entrapment neuropathies, and is a recognised occupational disease. The carpal tunnel is an anatomical compartment bounded on three sides by the carpal bones, and the transverse carpal ligament on the palmar side. Intermittent or sustained high pressure within this compartment produces

ischaemia of the median nerve, resulting in the classical symptoms of paraesthesia and pain. If allowed to progress, weakness and wasting develop which eventually become irreversible.

Nerve conduction studies are an important diagnostic test, and are the best predictor of symptom severity and functional status. Treatment depends on severity, and includes splinting, corticosteroid interventions or surgical decompression. In the future pulsed radio frequency may be used.

Gout is caused by the deposition of monosodium urate crystals within a joint, leading to excruciating pain and swelling. It is not a common cause of the symptoms described above.

Hypertrophic osteoarthropathy may occur secondary to primary lung carcinoma. It presents with clubbing, arthralgia, arthritis and periostosis of the tubular bones. Pain is severe and is present throughout the day.

Rheumatoid arthritis is a possibility in women of this age group, but more commonly presents with swelling and pain of the small joints of the hand.

Toxic neuropathy presents with weakness, sensory loss and reduced reflexes secondary to diffuse nerve damage. This can be caused by a variety of agents but is much less common than carpal tunnel syndrome, making it a less likely answer in this case.



[Q: 3409] OnExamination 2012 - Rheumatology

A 62-year-old man has back pain.

An FBC reveals the following:

WBC $3.7 \times 10^9/L$ (4-11)

Haemoglobin 10.3 g/dl (14-18)

MCV 85 fl (80-100)

Platelets $110 \times 10^9/L$ (150-400)

His total serum protein is 85 g/l with an albumin of 41 g/l. A chest x ray shows no abnormalities of heart or lung fields, but there are several lucencies in the vertebral bodies. You perform a sternal bone marrow aspirate and get a dark red jelly-like material in the syringe.

The smear of the aspirate is most likely to show which of the following cell types as a prominent feature?

- 1- Fibroblasts
- 2- Giant cells
- 3- Metastatic renal cell carcinoma cells
- 4- Osteoblasts
- 5- Plasma cells

Answer & Comments

Answer: 5- Plasma cells

The patient has multiple myeloma. The bone marrow needle was in a lytic lesion filled with plasma cells. His serum globulin is high from a monoclonal gammopathy.

Osteoblasts are most numerous in repair of bone, and callus is very firm.

Fibroblasts produce collagen and are more numerous with the gross appearance of firm, white scar tissue.

Giant cells may be seen in a variety of benign and malignant lesions of bone, but this does not explain the hypergammaglobulinaemia.

Osteolytic metastases of renal cell carcinoma could have the gross appearance described here, but would not account for hypergammaglobulinaemia.



[Q: 3410] OnExamination 2012 - Rheumatology

A 35-year-old woman who was two months postpartum presented with a four week history of joint pain, facial rash and fever.

Blood tests reveal an ESR of 40 mm/hour (0-20).

What is the most likely diagnosis?

- 1- Reactive arthritis
- 2- Rheumatoid arthritis
- 3- Sarcoidosis
- 4- Systemic lupus erythematosus (SLE)
- 5- Viral arthritis

Answer & Comments

Answer: 4- Systemic lupus erythematosus (SLE)

The triad of fever, arthralgia and rash in a woman of childbearing age should suggest the diagnosis of systemic lupus erythematosus (SLE).

SLE is a heterogenous multisystem autoimmune inflammatory disease, in which antinuclear antibodies occur. Its presentation and course are highly variable, ranging from indolent to fulminant. The diagnosis is based on the American College of Rheumatology (ACR) criteria. Management depends on disease severity.

Reactive arthritis is a post-infective autoimmune condition that is associated with gastrointestinal (Shigella, Salmonella, Campylobacter) and genitourinary infections (Chlamydia). Classically it presents with arthritis and conjunctivitis. There will be a recent history of gastroenteritis or urethritis.

Rheumatoid arthritis typically presents with a persistent symmetrical polyarthritis affecting the hands and feet. Extra-articular features such as fever and rash occur much less commonly than in SLE. Anti-CCP antibodies are highly specific and should be tested if the diagnosis is suspected.

Sarcoidosis is a multisystem inflammatory disease of unknown aetiology, characterised by the presence of non-caseating granulomas in affected tissue. Approximately 5% of cases

are asymptomatic and are detected on chest x ray.

Sarcoid commonly presents with a dry cough, with or without dyspnoea and systemic complaints.

Viral arthritis is a condition which is difficult to diagnose. It occurs during the viral prodrome, and is often accompanied by a rash. Most commonly patients present with symmetrical small joint involvement, although the exact pattern depends on the causative virus. Viruses commonly associated include parvovirus B19, hepatitis A, B and C, rubella and HIV.

Whilst the fever, rash and joint pain in the above scenario would be consistent with viral arthritis, symptoms would have typically resolved over a four week period.



[Q: 3411] OnExamination 2012 - Rheumatology

A 38-year-old woman from Pakistan presents with a six week history of non-productive cough, subjective fever, chills and progressively worsening shortness of breath.

She reports that recently she has been able to walk for only five to 10 minutes before having to stop and rest for breath. She has lost 2 kg over this period.

There is no recent travel history or guests visiting from endemic regions.

She has a 10 year diagnosis of rheumatoid arthritis for which she was commenced on etanercept six months ago.

Clinical examination demonstrated: temperature 38.0°C, pulse 100 regular, normal heart sounds, respiratory rate 18, mild mid zone inspiratory crepitations, SaO₂ 98% (pre-exertion), 89% (post exertion).

Basic bloods show;

Hb 10.7g/dL(11.5-16.5)

MCV 88fL(80 - 96)

WCC $4.9 \times 10^9/L$ (4 - 11)

Westergren ESR 44/hr(0 - 20)

CRP 34mg/L(<10)

Chest radiography demonstrates diffuse bilateral infiltrates.

Which test is most likely to be diagnostic?

- 1- Aspergillus precipitin
- 2- Bronchoalveolar lavage
- 3- High resolution CT
- 4- Mycoplasma serology
- 5- QuantiFERON

Answer & Comments

Answer: 2- Bronchoalveolar lavage

Learning points:

Potential complications of anti-TNF use in rheumatoid arthritis

Clinical presentation of Pneumocystis jiroveci (PCP).

This patient has developed Pneumocystis jiroveci (formerly Pneumocystis carinii) pneumonia after commencing anti-TNF therapy, a known risk factor.

The temporal relationship, dry cough, fever, weight loss and inducible post exertional hypoxia should point you towards this diagnosis.

Anti-TNF therapy also predisposes mycobacterial infection and this must be excluded before commencing treatment.

Her radiograph and a clinical history of 2 kg weight loss in two months (insignificant value) are not consistent with this diagnosis.



[Q: 3412] OnExamination 2012 - Rheumatology

A 72-year-old man presents with a three day history of acute onset, progressively worsening knee pain which began 24 hours

after returning from a walking holiday in the New Forest. There is associated knee joint stiffness in the morning lasting approximately 20 minutes. He has an intermittent subjective fever.

He is currently partially weight bearing and reports particular difficulty ascending the stairs at home. His temperature is 37.2°C, pulse 88, blood pressure 128/90 mmHg. The left knee is swollen, tender and normothermic with crepitus present during a markedly reduced active range of motion.

Initial investigations demonstrated the following;

FBC normal

Westergren ESR 38mm/hr(0 - 30)

CRP <5mg/L(< 10)

Rheumatoid factor titre 1:80(>1:40)

Synovial fluid aspirate WCC 1800/mm³ (<2000)

Which one of the following is the most likely diagnosis?

- 1- *Borrelia burgdorferi* monoarticular synovitis
- 2- Calcium pyrophosphate arthropathy
- 3- Patellofemoral osteoarthritis
- 4- Prepatellar bursitis
- 5- Rheumatoid arthritis

Answer & Comments

Answer: 3- Patellofemoral osteoarthritis

Learning points:

Clinical criteria for diagnosing knee osteoarthritis (OA)

Clinical presentation of OA

Common differentials for OA

Basic investigations and work up of monoarticular pain.

This 72-year-old man presents with a classical history for patellofemoral osteoarthritis (OA).

His age (greater than 45 years)

Morning stiffness lasting less than 30 minutes

Functional limitation and

Joint crepitus on active motion

fulfill the clinical criteria for diagnosis.

Joint crepitus does not occur with prepatellar bursitis.

His inflammatory markers are normal, militating against rheumatoid arthritis.

The upper limit for synovial fluid WCC in OA is 2000/mm³. White cells higher than this may suggest an inflammatory or septic arthritis, depending on the clinical context.

His weakly positive rheumatoid factor (titre should be greater than 1:40) is likely a product of his age.

The minimum incubation period for Lyme disease is three days, and the diagnosis is much less likely in a patient of this age where osteoarthritis is highly prevalent

There is no mention of crystals on synovial fluid examination to suggest pseudogout, although this can complicate osteoarthritis.



[Q: 3413] OnExamination 2012 - Rheumatology

A 25-year-old lady presents with rapidly worsening Raynaud's phenomenon, and skin tightness.

On examination, there is sclerodactyly, skin thickening to the shoulders, and bi-basal crepitations. Muscle strength is normal.

Recent blood tests are:

Hb 12.1g/dl(11.5 - 16.5 g/dL)

WBC 7.8 x 10⁹/L (4 - 11 x 10⁹/L)

Neutrophils 70%(40-75%)

Platelet $270 \times 10^9/\mu\text{l}$ ($150 - 400 \times 10^9/\text{L}$)
 ESR 36 mm/hr ($0 - 20 \text{ mm}/1\text{st hr}$)
 Anti-nuclear anti-body positive (1:6400)
 (Negative at 1:20 Dil)
 Anti-centromere antibody negative (Negative
 at 1:40 Dil)
 Anti-Scl70 antibody positive (1:640)
 (Negative)
 Anti-U1RNP negative (Negative)
 Anti-Ro/La antibody negative (Negative)
 Urea, electrolytes and creatinine Normal

What is the diagnosis?

- 1- Dermatomyositis
- 2- Diffuse cutaneous systemic sclerosis
- 3- Limited cutaneous systemic sclerosis
- 4- Mixed connective tissue disease
- 5- Sjogren's syndrome

Answer & Comments

Answer: 2- Diffuse cutaneous systemic sclerosis

This patient has diffuse cutaneous systemic sclerosis with pulmonary fibrosis.

Diffuse cutaneous systemic sclerosis is characterised by

Skin thickening proximal to the knees and elbows

Anti-Scl70 antibodies

Pulmonary fibrosis, and rarely by

Scleroderma renal crisis.

Limited cutaneous systemic sclerosis is characterised by

Skin thickening distal to knees, and elbows (although face may be involved in either type)

Anti-centromere antibodies, and

A tendency to develop pulmonary hypertension.

She does not have any muscle weakness, or rash making dermatomyositis unlikely. Dermatomyositis associates with Gottron's papules on extensor surface of hands, and a periorbital heliotrope rash.

The co-existence of myositis, arthritis, and scleroderma in those with anti-U1 RNP antibodies suggests mixed connective tissue disease. This is clearly not the case here.



[Q: 3414] OnExamination 2012 - Rheumatology

A 76-year-old man presents with a painful, swollen right knee and difficulty in walking for three days.

On examination, his temperature is 36.8 C. The right knee is red, swollen, warm and tender and has restricted movement.

The knee aspirate shows no organisms on Gram stain, 200 leucocytes/mm³, and weakly positively birefringent crystals on polarised light microscopy.

The results of recent blood tests are:

Hb 12.3 g/dl ($13.0 - 18.0 \text{ g/dL}$)

WBC $14.3 \times 10^9/\text{L}$ ($4 - 11 \times 10^9/\text{L}$)

Neutrophils 88% ($40-75\%$)

Platelet $340 \times 10^9/\text{L}$ ($150 - 400 \times 10^9/\text{L}$)

Urea, electrolytes and creatinine: Normal

ESR 79 mm/hr ($0 - 20 \text{ mm}/1\text{st hr}$)

Urate 321 $\mu\text{mol/l}$ ($210-415 \mu\text{mol/l}$)

What is the most likely diagnosis?

- 1- Gout
- 2- Osteoarthritis
- 3- Pseudogout
- 4- Reactive arthritis
- 5- Septic arthritis

Answer & Comments

Answer: 3- Pseudogout

This presentation could be consistent with a number of diagnoses. However, the presence of positively birefringent crystals make pseudogout (calcium pyrophosphate arthropathy) the most likely diagnosis. It is critical to exclude septic arthritis, as it is potentially rapidly destructive, but the negative gram stain and low synovial fluid white cell count make this less likely.

Classically pseudogout presents with a rapid onset of inflammatory symptoms and signs. Risk factors include age, osteoarthritis and metabolic disturbance (e.g. primary hyperparathyroidism, haemochromatosis). Management of acute episodes include cool packs, rest, joint aspiration and steroid injection. Prophylaxis is typically with oral NSAIDs and/or low-dose colchicine. Oral corticosteroids, methotrexate or hydroxychloroquine can be used in resistant disease. Asymptomatic crystal deposition does not need treatment. The differential does include gout but isolated monoarthritis of the knee is less common than with pseudogout. Distinguishing between the two depends on analysis of the crystals with calcium pyrophosphate crystals demonstrating no or positive birefringence and urate crystals demonstrating a negative birefringence under polarising light.

The white cell count in septic arthritis is typically more than 2000/mm³, with more than 75% polymorphonuclear leucocytes. Gram stain may be positive.

Osteoarthritis of the knee usually presents as a more chronic mechanical joint pain.

Reactive arthritis is more common in younger patients, and there is a typically a history of infection (usually gastroenterological or sexually-transmitted) which predates the onset of joint symptoms.



[Q: 3415] OnExamination 2012 - Rheumatology

A 37-year-old lady with well controlled asthma since teenage presents with a six week history of gradually worsening asthma, sinusitis, weight loss, and fatigue.

On examination, there is scattered wheeze bilaterally, and there is a non-blanching petechial rash on the shin. Muscle strength is normal.

Recent blood tests show:

Hb 11.1gm/dl(11.5 - 16.5 g/dL)

WBC 14.8 x 10⁹/L (4 - 11 x 10⁹/L)

Neutrophils 60%(40-75%)

Lymphocytes 10%(20-45%)

Eosinophils 30%(1-6%)

Platelet 270 x 10⁹/L (150 - 400 x 10⁹/L)

ESR 86 mm/hr(0 - 20 mm/1st hr)

CRP 143 mg/L(< 10 mg/L)

Anti-myeloperoxidase antibody Positive

pANCA Positive

cANCA negative

Urea, electrolytes & creatinine normal

What is the diagnosis?

- 1- Allergic bronchopulmonary aspergillosis
- 2- Churg-Strauss syndrome
- 3- Eosinophilic pneumonia
- 4- Hypersensitivity pneumonitis
- 5- Wegener's granulomatosis

Answer & Comments

Answer: 2- Churg-Strauss syndrome

Churg-Strauss syndrome (CSS) is a rare form of small-vessel vasculitis, characterised by asthma, allergic rhinitis and prominent peripheral blood eosinophilia. All of these are present in the history and should lead you to the diagnosis of Churg Strauss.

The most commonly involved organ is the lung, followed by the skin. CSS, however, can affect any organ system, including the cardiovascular, gastrointestinal, renal, and central nervous systems. The unifying feature of patients presenting with CSS is asthma. Vasculitis involving the peripheral nervous system is also a characteristic feature, and mononeuritis multiplex occurs in 75% of patients.

Vasculitis of extrapulmonary organs is largely responsible for the morbidity and mortality associated with CSS. 40-60% are associated with positive ANCA, usually pANCA/MPO.

ANCA are antineutrophil cytoplasmic antibodies. Several different staining patterns and antigen specificities are recognised. The cytoplasmic staining pattern, cANCA, and specificity for the PR3 antigen is most specific for Wegener's granulomatosis. Perinuclear staining, pANCA, and/or antibody to MPO are far less specific than cANCA and can be present in a range of inflammatory conditions such as microscopic polyangitis, Churg-Strauss syndrome and Goodpasture's syndrome. MPO and pANCA may also be present in SLE, rheumatoid arthritis, Sjogren syndrome and occasionally in chronic infections.

Intravenous glucocorticoid is used for initial therapy of acute multi-organ involvement in Churg-Strauss syndrome, followed by oral glucocorticoid therapy, often with azathioprine as a steroid-sparing agent. Loss of vision is rare but can occur and must be treated aggressively.

Allergic bronchopulmonary aspergillosis is a hypersensitivity reaction to *Aspergillus*. Its clinical presentation varies from corticosteroid-dependent asthma to diffuse bronchiectasis with fibrosis. Visual loss is not an associated feature.

Wegener's granulomatosis is a multi-organ autoimmune disease, which can be fatal. The

classical triad consists of necrotising granulomatous inflammation of the respiratory tract, glomerulonephritis and a small-vessel vasculitis. A prolonged history of epistaxis or sinusitis is commonly found in Wegener's granulomatosis, which in some patients is also associated with an eosinophilia.

Hypereosinophilic syndrome is characterised by a peripheral blood eosinophil count of >1.5 for more than 6 months. Generalised symptoms are fatigue, myalgia, fever, night sweats, diarrhoea and pruritis. Other symptoms depend on the organ involved: cardiac disease causes chest pain and dyspnoea, respiratory disease presents with a dry cough.



[Q: 3416] OnExamination 2012 - Rheumatology

A 67-year-old woman with polymyalgia rheumatica was commenced on prednisolone 15 mg/day, and had excellent therapeutic response.

The steroid dose has now been reduced to 10 mg/day, and the plan is to continue tapering the prednisolone dose by 1 mg/month, aiming to discontinue prednisolone in a year's time.

Which of the following is the best approach to osteoporosis prophylaxis for her?

- 1- Alendronic acid
- 2- Alendronic acid, and calcium carbonate + vitamin D
- 3- Calcium carbonate
- 4- Calcium carbonate + vitamin D
- 5- Check bone mineral density

Answer & Comments

Answer: 2- Alendronic acid, and calcium carbonate + vitamin D

Oral glucocorticoids are associated with significant increase in fracture risk from doses as low as 5 mg daily. Loss of bone mineral density is greatest in the first few months of glucocorticoid therapy, but fracture risk declines rapidly after stopping. There is an increased risk of fracture over and above the effect of low bone mineral density.

Patients older than 65 years are considered at high risk of osteoporotic fractures, as are those with a prior fragility fracture, and they should commence on bone protective therapy at the time of starting glucocorticoid therapy.

Measurement of bone density is not required before starting therapy. In patients younger than 65 years without risk factors, DEXA scan is recommended for assessment of fracture risk.

General measures to reduce bone loss include use of the lowest dose of glucocorticoids possible, and steroid-sparing agents. Dietary calcium should be increased and physical activity, with smoking and alcohol minimised. Daily intake 1,500 mg of calcium and 800U of vitamin D3 is recommended.

Bone protective therapy which can be used includes alendronate, alfacalcidol, calcitonin, calcitriol, cyclic etidronate and risedronate.



[Q: 3417] OnExamination 2012 - Rheumatology

An 84-year-old man presents with right upper arm pain which he has had for the last few months. The pain is worsening progressively, and wakes him up at night.

He is known to have Paget's disease involving lumbar spine and pelvis, and is on oral bisphosphonates for this. There is no history of injury.

On examination the shoulder movements are free, and normal.

What is the most likely cause of his arm pain?

- 1- Fracture
- 2- Osteoarthritis
- 3- Osteonecrosis
- 4- Osteosarcoma
- 5- Paget's disease

Answer & Comments

Answer: 4- Osteosarcoma

Osteosarcoma is the most likely cause of his arm pain.

Osteosarcoma occurs in 1% of patients with Paget's disease, and accounts for 30% of cases of late onset osteosarcoma.

Although Paget's disease is associated with pathological fracture at the affected site, this man is not known to have Paget's disease at the humerus - which is an uncommon site for Paget's disease anyway; and there is no history of injury.

Similarly, the speed of progression of symptoms, presence of night pain and normal joint movements precludes the diagnosis of osteoarthritis.

Osteonecrosis has been associated with intravenous bisphosphonates (for example, zoledronic acid), and although rare, occurs in cancer patients who may be treated with large doses of corticosteroids, or who are known to have bone metastases.



[Q: 3418] OnExamination 2012 - Rheumatology

A 80-year-old man presents with deteriorating lumbar and bilateral hip pains. He has recently been seen by his GP with symptoms of prostatism.

Investigations revealed:

Full blood count Normal

Corrected Calcium 2.3 mmol/l (2.2-2.6)

ESR 22 mm/1st hr(1-10)

Alkaline phosphatase 985 U/l (60-110)

Gamma-GT 33 U/l (<50)

Prostate specific antigen 6.6 pg/l (0-6)

What is the most likely cause of this man's pain?

- 1- Multiple myeloma
- 2- Osteomalacia
- 3- Paget's disease of the pelvis
- 4- Polymyalgia rheumatica (PMR)
- 5- Prostatic carcinoma with metastases

Answer & Comments

Answer: 3- Paget's disease of the pelvis

This elderly patient presenting with bone pains has elevated alkaline phosphatase with normal calcium concentrations suggesting a diagnosis of Paget's disease.

The slightly elevated PSA is in keeping with benign prostatic hypertrophy rather than prostatic malignancy where a PSA of above 10 would be expected in widespread disease.

The normal calcium and only slightly elevated erythrocyte sedimentation rate (ESR) argues against osteomalacia, myeloma and PMR.

Regarding Paget's disease:

Increased bone turnover gives disordered bone formation, abnormal remodelling and deformity

Typically affects elderly patients

Can be asymptomatic

Symptoms include deafness, bone pain, breathlessness due to high-output cardiac failure (rare) and nerve compression

Complications include pathological fractures and there is a small risk of developing osteosarcoma.

Treatment is with bisphosphonates and analgesia.



[Q: 3419] OnExamination 2012 - Rheumatology

A 55-year-old lady presents with swelling, increased sweating, persistent erythema, and increased pain sensitivity in her right hand, and forearm for the last few months.

She had a right Colles fracture four months ago, and has been discharged from orthopaedics with good fracture healing.

On examination, the affected limb is swollen, erythematous, sweaty and there is increased pain sensitivity on the affected side. Fine touch is perceived as painful. Recent blood tests have been normal.

What is the diagnosis?

- 1- Cellulitis
- 2- Complex regional pain syndrome type I
- 3- Complex regional pain syndrome type II
- 4- Deep vein thrombosis
- 5- Osteomyelitis

Answer & Comments

Answer: 2- Complex regional pain syndrome type I

This patient has complex regional pain syndrome (CRPS) which is a chronic pain condition that can affect any area of the body, but often affects an arm or a leg, and occurs after an injury or rarely after a sudden illness such as a heart attack or stroke.

The condition can sometimes appear without obvious injury to the affected limb.

CRPS has two forms:

CRPS I occurs in the absence of a preceding nerve injury

CRPS II is caused by an injury to the nerve.

The key symptom is pain that

Is intense and burning

Is disproportionate to the original injury

Is worse over time

Spreads beyond the site of injury and

Is associated with hyperalgesia, hyperpathia or allodynia on examination. These features do not occur in DVT, osteomyelitis, or cellulitis.

CRPS may have three stages (acute, dystrophic, and atrophic), with variable progression from one stage to another.

CRPS is a clinical diagnosis, and various imaging modalities show non-specific changes which support its diagnosis:

Plain radiographs may show soft tissue swelling, peri-articular osteoporosis, and rarely erosions

MRI may also show bone marrow oedema apart from these changes

99mTc bone scan shows hypervascularity in the acute phase, and hypovascularity in the atrophic phase.

In the atrophic phase, imaging may show contractures.



[Q: 3420] OnExamination 2012 - Rheumatology

A 52-year-old businessman presents to the emergency department complaining of worsening pain in his right big toe and knee.

He has recently been diagnosed by his GP with gout, and you can see from the computer that his urate at the time was 0.55 mmol/l (0.18-0.42). Current medication is 300 mg of allopurinol per day.

On examination he has severe pain and swelling over his right first MTP joint, consistent with gout.

What is the most appropriate management?

- 1- Add colchicine to his regime
- 2- Add naproxen to his regime
- 3- Decrease allopurinol to 100 mg

4- Decrease allopurinol to 200 mg

5- Stop allopurinol for a few days

Answer & Comments

Answer: 2- Add naproxen to his regime

Guidelines on the management of acute gout and advice on what to do with an acute attack of gout whilst on allopurinol exist in the summary of product characteristics (SPC) for the drug. These state that an acute flare whilst on allopurinol should not lead to cessation of the agent, but that it should be continued at the same dose, and a suitable non-steroidal anti-inflammatory agent added.

Colchicine is a reasonable alternative but is known to precipitate diarrhoea when an efficacious dose is reached, so is not normally the first line recommendation.



[Q: 3421] OnExamination 2012 - Rheumatology

A 72-year-old lady presents with pain and swelling of the left wrist.

Three weeks ago she received an intra-articular steroid injection into the wrist as treatment of chronic pain which was thought to be due to osteoarthritis.

On examination the joint is erythematous, swollen and tender.

Results reveal:

White cell count $12.5 \times 10^9/L$ ($4-11 \times 10^9$)

Rheumatoid factor 34 U/L (<20)

x Ray of wrist revealed a bony destruction of the joint and wrist aspiration revealed only a dry tap.

What is the most likely diagnosis?

- 1- Acute gout
- 2- Acute inflammatory reaction related to osteoarthritis
- 3- Acute rheumatoid arthritis

4- Pyrophosphate arthropathy

5- Septic arthritis

Answer & Comments

Answer: 5- Septic arthritis

Septic arthritis is a potential catastrophic complication of intra-articular steroid injection, although it is rare. In general there is wide variation in the precautions taken to avoid such a complication. Fluid should be aspirated for urgent Gram-stain and antibiotics started immediately (choice depends on local policy).

Gout presents with acute onset of pain, classically in the first metatarsophalangeal joint of the foot, due to monosodium urate crystal deposition. It is more common in men than women.

Pseudogout more commonly complicates osteoarthritis, and results from calcium pyrophosphate crystal deposition. The knee is affected more often than the wrist, and in the context of recent instrumentation it is critical septic arthritis is excluded.

A flare of osteoarthritis is a possibility but septic arthritis needs to be excluded before making this diagnosis.

In a lady of this age, with no other features and a known diagnosis of osteoarthritis, rheumatoid arthritis is unlikely. The positive rheumatoid factor is a red herring, it is mildly positive here and is found in 2.5% of the population and may be raised in association with malignancy, systemic lupus erythematosus and infection.



[Q: 3422] OnExamination 2012 - Rheumatology

A 52-year-old woman with type 2 diabetes presents with a two month history of painful hands and feet.

Investigations confirm a diagnosis of sero-positive erosive rheumatoid arthritis. She has some pain relief from non-steroidal anti-inflammatory agents. She currently takes metformin 500 mg tds and has good glycaemic control as reflected by a HbA1c of 6.7% (3.8-6.4).

Which of the following DMARDS would be most appropriate initial treatment of her early rheumatoid arthritis?

1- Ciclosporin

2- Etanercept

3- Hydroxychloroquine

4- IM gold

5- Methotrexate

Answer & Comments

Answer: 5- Methotrexate

Guidance recommends the use of disease modifying anti-rheumatic drugs (DMARDs) early in the treatment of rheumatoid arthritis, maintaining function and reducing progression of the disease (SIGN 2001). First line agents include methotrexate and sulfasalazine (SIGN 2000) and most subjects receive methotrexate.

Generally gold is considered more toxic than the former two and hydroxychloroquine is probably less effective.

Ciclosporin is again rather more toxic than either methotrexate or sulfasalazine, with nephrotoxicity and immunosuppression and is generally reserved for RHA with systemic features such as vasculitis.

The tumour necrosis factor (TNF) alpha antagonists, etanercept and infliximab, are generally reserved for individuals unresponsive to traditional DMARDs*.

Reference:

British Society for Rheumatology guidelines



[Q: 3423] OnExamination 2012 -
Rheumatology

A 55-year-old woman receiving 10 mg of methotrexate and 5 mg of folate* weekly presents with a sore right finger after cutting herself in the garden.

On examination she has a swollen erythematous right ring finger up to the proximal interphalangeal joint and you diagnose a cellulitis. You give her a prescription for erythromycin as she is allergic to penicillins. She has been receiving the methotrexate for just over one year with no problems and all routine blood monitoring has been normal.

Whilst monitoring the response of the infection to treatment, what is the most appropriate strategy regarding her methotrexate therapy?

- 1- Continue methotrexate and folate unchanged.
- 2- Continue methotrexate unchanged and increase folate supplements to 10 mg daily.
- 3- Reduce dose of methotrexate to 5 mg weekly
- 4- Stop methotrexate only if full blood count reveals a neutropenia.
- 5- Stop methotrexate until the infection has resolved.

Answer & Comments

Answer: 5- Stop methotrexate until the infection has resolved.

In the circumstances of infection one should consider temporarily stopping methotrexate as it is an immunosuppressant.

Any infection should be treated as usual and the response to treatment monitored. Once the infection has been successfully treated methotrexate can be reinstated. However, if the patient has recurrent serious infections

while taking methotrexate its continued long term use should be discussed with the patient's rheumatologist.

*Some local variations may exist regarding dose and frequency of folate therapy. Please be aware of your local guidelines.



[Q: 3424] OnExamination 2012 -
Rheumatology

A 36-year-old man attends clinic for advice.

He is currently taking methotrexate 7.5 mg weekly. His wife is fit and well, with no past medical history of note and not taking any medication apart from the oral contraceptive pill.

They are keen to start a family and want to know about continued contraception and whether there is a need to stop methotrexate.

Which of the following would you advise?

- 1- They can discontinue with contraception now and the husband can continue with the methotrexate
- 2- They can discontinue with contraception now but the husband needs to stop taking methotrexate
- 3- They should continue with adequate contraception for at least four weeks after the husband stops the methotrexate
- 4- They should continue with adequate contraception for at least three months after the husband stops the methotrexate
- 5- They should continue with adequate contraception for at least one year after the husband stops the methotrexate

Answer & Comments

Answer: 4- They should continue with adequate contraception for at least three months after the husband stops the methotrexate

Methotrexate is teratogenic and, according to the British National Formulary (BNF), the manufacturers advise effective contraception during and for at least three months after stopping methotrexate.

Fertility may be reduced during treatment, but this usually reverses upon stopping. This advice applies to both females and males who are taking methotrexate.

The National Patient Safety Agency (NPSA) state on their patient held record that "It is recommended that men wait six months after finishing their treatment, before trying to father a child as sperm can be affected".



[Q: 3425] OnExamination 2012 - Rheumatology

A 35-year-old woman presents with malaise, thirst and increasing nocturia over the last month.

Six months ago she attended the Emergency department with an episode of renal colic. One month previously her GP had noted an eruptive, painful, erythematous rash on the anterior shins, which was self-limiting.

What is the likely cause of her symptoms?

- 1- Hypercalcaemia
- 2- Hyperglycaemia
- 3- Hypocalcaemia
- 4- Hypokalaemia
- 5- Hyperoxaluria

Answer & Comments

Answer: 1- Hypercalcaemia

The most likely diagnosis in this case is sarcoidosis.

Sarcoidosis is a multisystem granulomatous disorder. It is relatively uncommon in the United Kingdom as a whole, but is more prevalent and more severe in Afro-Caribbean

populations. Onset of symptoms is typically in adults around 20-40-years-old.

Features of sarcoidosis include:

Bilateral hilar lymphadenopathy

Hypercalcaemia, which may be sensitive to steroids

Erythema nodosum

Neurological sequelae including neuropathy and Bell's palsy

Cardiomyopathy

Eye inflammation: uveitis and conjunctivitis

Hepatosplenomegaly.

Hypercalcaemia has a varied presentation.

At levels less than 2.8mmol/L polyuria, polydipsia, dyspepsia, depression and mild cognitive impairment predominate. At levels up to 3.5mmol/L patients present with muscle weakness, constipation, anorexia, nausea and fatigue. Above this level, patients develop vomiting, dehydration, cardiac arrhythmias, coma and pancreatitis.

Hyperglycaemia can cause thirst, nocturia and malaise but is not commonly associated with renal colic or erythema nodosum.

Hypocalcaemia leads to paraesthesia, tetany, carpopedal spasm and muscle cramps.

Hypokalaemia is generally asymptomatic, but severe deficiency can cause muscle weakness, paraesthesia and tetany.

Hyperoxaluria can be either primary or secondary, and is normally asymptomatic until nephrolithiasis develops.



[Q: 3426] OnExamination 2012 - Rheumatology

Which of the following best describes the mode of action of alendronate?

- 1- Inhibits osteoclast activity

- 2- Promotes bone matrix calcification
- 3- Promotes collagen synthesis
- 4- Promotes renal absorption of calcium
- 5- Stimulates osteoblast activity

Answer & Comments

Answer: 1- Inhibits osteoclast activity

Simple bisphosphonates such as clodronate and etidronate inhibit bone resorption through induction of osteoclast apoptosis.

Clodronate, and perhaps etidronate, triggers apoptosis by generating a toxic analogue of adenosine triphosphate which then targets the mitochondria.

For nitrogen-containing bisphosphonates the direct intracellular target is the enzyme farnesyl diphosphate synthase in the cholesterol biosynthetic pathway. Its inhibition suppresses a process called protein geranylgeranylation which is essential for the basic cellular processes required for osteoclastic bone resorption.

Although nitrogen-containing bisphosphonates can induce osteoclast apoptosis this is not necessary for their inhibition of bone resorption.



[Q: 3427] OnExamination 2012 - Rheumatology

A 39-year-old female presents with weakness, diplopia and fatigue.

She had recently been diagnosed with rheumatoid arthritis.

On examination there is bilateral ptosis and weakness of abduction of both eyes and mild proximal weakness of the arms and legs but normal reflexes and sensation.

What is the most likely diagnosis?

- 1- Guillain-Barré syndrome
- 2- Mononeuritis multiplex

- 3- Multiple sclerosis
- 4- Myasthenia gravis
- 5- Polymyositis

Answer & Comments

Answer: 4- Myasthenia gravis

The most likely diagnosis is myasthenia gravis.

There is an association between myasthenia gravis and thyroid disease, pernicious anaemia, systemic lupus erythematosus and rheumatoid arthritis. The condition is more common in women with a peak incidence around the age of 30. It is characterised by weakness and fatigability of the proximal limb muscles, ocular and bulbar muscles.

Seventy five per cent of patients initially complain of ocular disturbance, mainly ptosis and diplopia. Reflexes are initially preserved but may be fatigable. In Guillain-Barre syndrome there is a post-infective weakness and numbness in the distal limbs which ascends over days and weeks.

Multiple sclerosis can produce a variety of neurological symptoms. Common ophthalmic presentations include optic neuritis and internuclear ophthalmoplegia.

Mononeuritis multiplex describes an asymmetric asynchronous sensory and motor peripheral neuropathy, involving at least two separate nerve areas. It can be caused by a number of different disorders, including diabetes, vasculitis, Lyme disease and sarcoidosis.

Polymyositis classically presents with relatively painless progressive proximal muscle weakness. Dysphagia is common but the ocular muscles are very rarely involved unlike myasthenia gravis where this is a predominant feature.



[Q: 3428] OnExamination 2012 - Rheumatology

A 72-year-old man presents with an acutely painful right knee.

On examination, he has a temperature of 37°C with a hot, swollen right knee.

Of relevance amongst his investigations, is a white cell count of $12.6 \times 10^9/L$ ($4-11 \times 10^9$) and a knee radiograph which shows reduced joint space and calcification of the articular cartilage.

Culture of aspirated fluid reveals no growth.

What is the most likely diagnosis?

- 1- Gout
- 2- Pseudogout
- 3- Psoriatic monoarthropathy
- 4- Rheumatoid arthritis
- 5- Septic arthritis

Answer & Comments

Answer: 2- Pseudogout

This is a typical presentation of pseudogout / (calcium pyrophosphate arthropathy) with evidence of osteoarthritis, calcification of the articular cartilage and no growth on synovial culture. Classically there is rapid onset inflammatory symptoms and signs. Risk factors include age, osteoarthritis and metabolic disturbance (e.g. primary hyperparathyroidism, haemochromatosis). Management of acute episodes include cool packs, rest, joint aspiration and steroid injection. Prophylaxis is typically with oral NSAIDs and/or low-dose colchicine. Oral corticosteroids, methotrexate or hydroxychloroquine can be used in resistant disease. Asymptomatic crystal deposition does not need treatment.

The differential does include gout but isolated monoarthritis of the knee is less common than with pseudogout. Distinguishing between the two depends on analysis of the

crystals with calcium pyrophosphate crystals demonstrating no or a positive birefringence and urate crystals demonstrating a negative birefringence under polarising light.

Distinguishing between the two depends on analysis of the crystals with CPP crystals demonstrating a positive birefringence and urate crystals demonstrating a negative birefringence.

It is rare for rheumatoid arthritis to present as a large joint monoarthritis is a gentleman of this age.

Negative synovial fluid culture makes septic arthritis a less likely diagnosis.

There are five classic presentations of psoriasis (none of which fit with this scenario):

1. Symmetrical polyarthritis: 'rheumatoid pattern'
2. Asymmetric oligoarticular/pauciarticular arthritis: initial involvement of the hands and feet with dactylitis
3. Distal interphalangeal joint predominant involvement
4. Arthritis mutilans
5. Spondylitic pattern

The typical rash of psoriasis usually predates the onset of arthritis.



[Q: 3429] OnExamination 2012 - Basic Science

You are investigating the properties of a novel oral TNF-alpha antagonist in late stage clinical trials.

Which of the following would be an expected property of this agent?

- 1- Decreased endothelial reactivity
- 2- Decreased HDL cholesterol
- 3- Decreased insulin sensitivity
- 4- Decreased protein catabolism
- 5- Increased acute phase protein production

Answer & Comments

Answer: 4- Decreased protein catabolism

Chronic inflammatory disorders including those associated with elevated tumour necrosis factor (TNF) are noted to be associated with increased arteriolar stiffness and decreased endothelial reactivity.

TNF-alpha elevation is also known to be associated with increased insulin resistance and associated lipid abnormalities such as decreased high-density lipoprotein (HDL) cholesterol.

Increased acute phase protein production is a feature of chronic inflammation, as such a TNF-alpha antagonist is recognised to reduce this.



[Q: 3430] OnExamination 2012 - Basic Science

Which of the following arteries are branches of the axillary artery?

- 1- Inferior ulnar collateral artery
- 2- Internal thoracic artery
- 3- Profunda brachii artery
- 4- Subscapular artery
- 5- Superior ulnar collateral artery

Answer & Comments

Answer: 4- Subscapular artery

The internal thoracic artery arises from the subclavian artery.

The inferior and superior ulnar collateral arteries and the profunda brachii are branches of the brachial artery.

The subscapular artery arises from the axillary and is its largest branch, eventually anastomosing with the lateral thoracic and intercostal arteries.



[Q: 3431] OnExamination 2012 - Basic Science

A 24-year-old man presents with proteinuria, haematuria and sensorineural deafness.

Which of the following protein structures is likely to be abnormal?

- 1- Fibrillin
- 2- Laminin
- 3- Type 1 collagen
- 4- Type 3 collagen
- 5- Type 4 collagen

Answer & Comments

Answer: 5- Type 4 collagen

The diagnosis is Alport's syndrome, which is a disorder of type 4 collagen assembly and is inherited as an X linked disorder in 85% of cases.

Fibrillin gene abnormalities are associated with Marfan's syndrome.

Type 1 collagen disorders are associated with osteogenesis imperfecta; it is the main type of collagen in tendon and bone.

Type 3 collagen is the main component of reticular fibres.



[Q: 3432] OnExamination 2012 - Basic Science

Which of the following does N-acetylcysteine replenish?

- 1- Cystathionine
- 2- Cytochrome P450
- 3- Glucuronyl transferase
- 4- Glutathione
- 5- Sulfatase

Answer & Comments

Answer: 4- Glutathione

Acetylcysteine, the N-acetyl derivative of the naturally occurring amino acid L-cysteine, is a mucolytic agent and sulfhydryl donor acting as an antidote for paracetamol overdose.



[Q: 3433] OnExamination 2012 - Basic Science

Which of the following genetic mutations is responsible for Marfan syndrome?

- 1- Collagen
- 2- Elastin
- 3- Fibrillin
- 4- Microfilament
- 5- Microtubule

Answer & Comments

Answer: 3- Fibrillin

Marfan syndrome occurs due to a mutation in the fibrillin gene.

Most patients, who are prone to develop an aortic aneurysm as a component of Marfan syndrome, can be identified by detection of mutations in the fibrillin-1 gene.

Patients with the rarer form of Marfan syndrome, which is characterised by contractural arachnodactyly instead of loose joints, can usually be identified by detection

of a mutation in the fibrillin-2 gene that is similar in structure to the gene for fibrillin-1.

Preliminary data suggest that patients with mutations in the fibrillin-2 gene are not prone to develop aneurysms.



[Q: 3434] OnExamination 2012 - Basic Science

Suppose you are attempting to find a disease-causing gene, and you have identified a number of families in which the disease is transmitted.

If you have no knowledge of the gene product and no reasonable candidate locus, which of the following would be the first technique you would be most likely to use?

- 1- Denaturing gradient gel electrophoresis (DGGE)
- 2- DNA sequencing
- 3- Fluorescence in situ hybridisation (FISH)
- 4- Linkage analysis
- 5- Single strand conformation polymorphism (SSCP) analysis

Answer & Comments

Answer: 4- Linkage analysis

Linkage analysis is correct.

Southern blotting is a laboratory procedure in which DNA fragments that have been electrophoresed through a gel are transferred to a solid membrane such as nitrocellulose. The DNA can then be hybridised with a labelled probe and exposed to x ray film.

Somatic cell hybridisation is a physical gene-mapping technique in which somatic cells from two different species are fused and allowed to undergo cell division. Chromosomes from one species are selectively lost resulting in clones with only one or a few chromosomes from one of the species.

FISH is a molecular cytogenetic technique in which labelled probes are hybridised with chromosomes and then visualised under a fluorescence microscope.

SSCP is a technique for detecting variation in DNA sequence by running single-stranded DNA fragments through a non-denaturing gel. Fragments with differing secondary structure (conformation) caused by sequence variation will migrate at different rates.



[Q: 3435] OnExamination 2012 - Basic Science

In one gene mapping technique, denatured deoxyribonucleic acid (DNA) from metaphase chromosomes is hybridised with a radioactively labelled probe. This DNA is then exposed to film to reveal the approximate chromosomal location of the DNA in the probe.

Which technique does this best describe?

- 1- Fluorescence in situ hybridisation (FISH)
- 2- In situ hybridisation
- 3- Single strand conformation polymorphism (SSCP) analysis
- 4- Southern blotting
- 5- Somatic cell hybridisation

Answer & Comments

Answer: 2- In situ hybridisation

The technique described is 'in situ hybridisation'.

Southern blotting is a laboratory procedure in which DNA fragments that have been electrophoresed through a gel are transferred to a solid membrane, such as nitrocellulose. The DNA can then be hybridised with a labelled probe and exposed to x ray film.

Somatic cell hybridisation is a physical gene mapping technique in which somatic cells from two different species are fused and

allowed to undergo cell division. Chromosomes from one species are selectively lost, resulting in clones with only one or a few chromosomes from one of the species.

FISH is a molecular cytogenetic technique in which labelled probes are hybridised with chromosomes and then visualised under a fluorescence microscope.

SSCP is a technique for detecting variation in DNA sequence by running single-stranded DNA fragments through a non-denaturing gel. Fragments with differing secondary structure (conformation) caused by sequence variation will migrate at different rates.



[Q: 3436] OnExamination 2012 - Basic Science

A 35-year-old male is struck on the lateral aspect of his right knee by the bumper of a car travelling at low velocity.

On examination he is unable to dorsiflex the ankle, evert the foot and extend the toes. There is loss of sensation of the dorsum of the foot.

He is most likely to have damaged which structure?

- 1- Common peroneal nerve
- 2- Deep peroneal nerve
- 3- Saphenous nerve
- 4- Sural nerve
- 5- Tibial nerve

Answer & Comments

Answer: 1- Common peroneal nerve

The common peroneal nerve supplies the muscles of the peroneal and anterior compartment of the leg and sensation to the dorsum of the foot.

The deep peroneal nerve is a division of the common peroneal nerve and supplies only

the muscles of the anterior compartment of the leg.



[Q: 3437] OnExamination 2012 - Basic Science

Which of the following statements regarding the hindbrain is/are accurate?

- 1- The locus caeruleus receives fibres from the facial nerve
- 2- The medulla oblongata opens into the third ventricle
- 3- The nucleus ambiguus gives rise to the hypoglossal nerve
- 4- The pyramidal tracts decussate prior to the hindbrain
- 5- The vermis lies medial to the cerebellar hemispheres

Answer & Comments

Answer: 5- The vermis lies medial to the cerebellar hemispheres

The hindbrain comprises:

The myelencephalon (medulla oblongata and lower part of the fourth ventricle)

The metencephalon (pons, cerebellum and intermediate part of fourth ventricle) and

Isthmus rhombencephalon.

The medulla oblongata opens into the fourth ventricle.

The nucleus ambiguus gives rise to fibres of the accessory, vagus and glossopharyngeal nerves.

The locus caeruleus receives sensory fibres from the trigeminal nerve.

The three parts of the cerebellum include the vermis and the two hemispheres which are confluent. The median portion of the cerebellum is the vermis and the cerebellar hemispheres lie lateral to it.

The pyramidal tracts decussate in the inferior part of the medulla.



[Q: 3438] OnExamination 2012 - Basic Science

During a neurological examination of the upper limb you attempt to elicit the triceps reflex.

You place the patient's arm across the chest, with the elbow flexed at 90°. The triceps tendon is struck with the tendon hammer.

Which nerve (and its nerve root) are you testing?

- 1- Median nerve C6
- 2- Median nerve C7
- 3- Radial nerve C5
- 4- Radial nerve C6
- 5- Radial nerve C7

Answer & Comments

Answer: 5- Radial nerve C7

The radial nerve innervates the triceps muscle; it is primarily derived from the C7 nerve root.

The radial nerve is the motor supply to the extensor compartments of the upper limb.

The triceps muscle is the chief extensor of the forearm. Its name derives from its three heads of origin (long, lateral and medial).

It attaches into the olecranon of the ulna.

Deep tendon reflexes...



[Q: 3439] OnExamination 2012 - Basic Science

A 70-year-old woman presented with bone pains in her back, shoulders and pelvis.

Investigations reveal:

Serum corrected Calcium 2.2 mmol/L(2.2-2.6)

Serum Phosphate 0.6 mmol/L(0.8-1.4)

Serum alkaline phosphatase 160 U/L(45-105)

What further investigation would be most helpful in making the diagnosis?

- 1- DEXA bone scan.
- 2- Parathyroid hormone concentration.
- 3- Serum vitamin D concentration.
- 4- Thyroid function test.
- 5- Urine Bence Jones protein estimation

Answer & Comments

Answer: 3- Serum vitamin D concentration.

The symptoms of proximal bone pain with hypocalcaemia and low phosphate suggest a diagnosis of osteomalacia in this elderly woman. Vitamin D concentrations should therefore be measured. Serum alkaline phosphatase is typically high as it is released from bone reflecting osteoblastic activity. Serum PTH is also usually elevated and normalises gradually on response to treatment.

Hypercalcaemia would be expected in multiple myeloma, hyperparathyroidism and hyperthyroidism.

A DEXA scan would assess the bone mineral density which allows osteoporosis to be diagnosed. Due to her age, this patient may have osteoporosis, but it is unlikely to be the cause of her pain. Classically, osteoporosis in the absence of fracture, does not cause pain. Many patients with osteoporosis have concomitant disorders such as osteomalacia and osteoarthritis which cause bone pain.



[Q: 3440] OnExamination 2012 - Basic Science

Which of the following medications can cause hypomagnesaemia?

- 1- Aminophylline
- 2- Amitriptyline
- 3- Cisplatin

4- Co-trimoxazole

5- Lithium

Answer & Comments

Answer: 3- Cisplatin

Most of the body's magnesium is intracellular with only 1% being extracellular, in blood and interstitial fluid. This means that blood magnesium levels do not necessarily correspond with whole body magnesium status.

Causes of hypomagnesaemia include:

Drugs including cisplatin, diuretics, cyclosporine and cardiac glycosides

Malabsorption syndromes

Diarrhoea

Hypercalcaemia

Alcohol

Metabolic acidosis

Renal diseases - pyelonephritis, glomerulonephritis, acute tubular necrosis and interstitial nephritis.

Profound hypomagnesaemia can cause tetany, seizures and cardiac arrhythmias and needs to be treated intravenously.

Lithium can cause hypermagnesaemia.



[Q: 3441] OnExamination 2012 - Basic Science

Which of the following are antibodies to which enzymes involved in glucose metabolism may be found in primary biliary cirrhosis?

- 1- All of the following
- 2- Glucokinase (generates glucose-6-phosphate from glucose)
- 3- Lactate dehydrogenase (generates lactate from pyruvate)

- 4- Pyruvate dehydrogenase (generates acetyl-CoA from pyruvate)
- 5- Pyruvate kinase (generates pyruvate from phosphoenolpyruvate)

Answer & Comments

Answer: 4- Pyruvate dehydrogenase (generates acetyl-CoA from pyruvate)

Pyruvate dehydrogenase (PD), required for the generation of acetyl-CoA from pyruvate for entry into the tricarboxylic acid (TCA) cycle, is found in the mitochondria.

Anti-mitochondrial antibodies (AMAs) - the serological hallmark of primary biliary cirrhosis (PBC) - are often targeted against pyruvate dehydrogenase.

The other enzymes listed are involved in glycolysis, which takes place in the cytosol.

Pyruvate dehydrogenase is crucial for aerobic respiration. Inherited deficiencies / defects of PD are rare but often present with severe lactic acidosis in neonates. When this occurs, there can be no generation of acetyl-CoA for the Krebs cycle. Anaerobic glycolysis occurs, as the cell attempts to make adenosine triphosphate (ATP), but lactate is formed creating an acidosis.

In health, PD competes with pyruvate carboxylase (PC) for their common substrate, pyruvate. PD produces acetyl-CoA for the Krebs cycle, whereas PC produces oxaloacetate, a substrate for gluconeogenesis.

Acetyl-CoA regulates the balance between these two reactions (and thus the balance between anabolic and catabolic pathways) by activating PC - so that in 'energy-rich' states, where acetyl-CoA is in abundance, gluconeogenesis will be favoured.

Reference:

Ah Mew et al. MRI Features of 4 Female Patients With Pyruvate Dehydrogenase E1 alpha

Deficiency. *Pediatr Neurol* (2011) vol. 45 (1) pp. 57-9

<http://themedicalbiochemistrypage.org/tca-cycle.html> (an excellent source for biochemical pathways with diagrams).



[Q: 3442] OnExamination 2012 - Basic Science

A 43-year-old woman presents with weight gain and menstrual irregularities.

Her BMI is 29 kg/m², blood pressure is 150/90 mmHg and urinalysis shows + glucose.

Which of the following investigations should be performed initially?

- 1- 24 hour urine cortisol
- 2- Aldosterone
- 3- HbA1c
- 4- Plasma testosterone
- 5- Prolactin

Answer & Comments

Answer: 1- 24 hour urine cortisol

This history is suggestive of Cushing's syndrome: hypertension, adiposity, menstrual irregularities and impaired glucose homeostasis or diabetes. It is caused by overproduction of cortisol. Other features are recurrent infections, osteoporosis, hypokalaemia and psychiatric disturbance.

Cushing's syndrome can be challenging to diagnose as it often requires several different diagnostic tests.

The 24 hour urine free cortisol (UFC) is a good initial screening test. Borderline results can occur with stress. If the UFC is elevated, consider repeating it and consider the overnight or low-dose dexamethasone suppression tests. Investigations are then often needed to localise the cause of Cushing's syndrome.

If Cushing's syndrome is excluded, serum prolactin, testosterone and HbA1c are all

reasonable tests to do. The patient may have polycystic ovarian syndrome (PCOS) with impaired glucose tolerance or diabetes. The presence of clinical or biochemical evidence of hyperandrogenism is useful in the diagnosis of PCOS - serum testosterone would be useful here. A prolactinoma can cause menstrual disturbance but is not particularly associated with weight gain or diabetes.

The correct answer remains UFC however, as you do not want to miss Cushing's syndrome.



[Q: 3443] OnExamination 2012 - Basic Science

Which of the following statements regarding myosin is correct?

- 1- Contains an cAMP-binding sites
- 2- Forms filaments in a pentameric array with two heavy chains and three light chains
- 3- Has no function when not part of a filament
- 4- It drives smooth muscle contraction
- 5- Myosin heavy chain mutations are associated with development of familial hypertrophic cardiomyopathy

Answer & Comments

Answer: 5- Myosin heavy chain mutations are associated with development of familial hypertrophic cardiomyopathy

Myosin drives striated muscle contraction, and can be divided into two groups :

Conventional (class II myosins) which form filaments in a hexameric array of two heavy chains and two pairs of light chains.

Unconventional myosins do not form filaments and perform varied functions in a broad range of cells (for example, organelle transport, endocytosis).

Myosin contains adenosine triphosphate (ATP) and actin-binding sites.

Other myosin related genetic disorders besides the heavy chain mutations in cardiomyopathy include Carney's complex (trismus-pseudocamptodactyly), type 1b Usher syndrome and non-syndromic deafness.



[Q: 3444] OnExamination 2012 - Basic Science

A 65-year-old man with a history of myocardial infarction four years earlier was admitted with progressive shortness of breath and decreasing exercise tolerance. He has smoked 40 cigarettes per day for the last 45 years.

He takes lansoprazole, aspirin and lisinopril.

Which of the following laboratory tests would help identify the reason for his symptoms?

- 1- Brain natriuretic peptide (BNP)
- 2- Clotting screen
- 3- C reactive protein
- 4- Full blood count
- 5- Urea and electrolytes

Answer & Comments

Answer: 1- Brain natriuretic peptide (BNP)

This patient has features of heart failure which appear to be related to underlying ischaemic heart disease. The differential diagnosis is COPD, given his extensive smoking history.

Heart failure is a clinical syndrome characterised by dyspnoea, fatigue and ankle oedema. Signs which can point towards the diagnosis are pulmonary rales, pleural effusion, raised jugular venous pressure and peripheral oedema. Objective evidence is gained from echocardiogram, and raised natriuretic peptide concentration. Cardiomegaly, third heart sound and murmurs can be suggestive of cardiac failure. The European Society of Cardiology

guidelines state there must be symptoms, signs AND objective evidence before a diagnosis of heart failure can be made. It is important to always attempt to identify the underlying cause.

BNP is a biologically active peptide, which has vasodilator and natriuretic properties. It is synthesised in the cardiac ventricles and correlates with left ventricle (LV) pressure, degree of dyspnoea, and state of neurohormonal modulation. Levels increase markedly in left ventricular dysfunction, and the level correlates with symptom severity (and decrease after effective treatment). It is raised in right or left systolic or diastolic heart failure. As such, it is an important clinical marker for the diagnosis of heart failure in patients with dyspnoea that could be attributed to a number of causes. Its use as a prognostic marker, therapy guide or screening marker is under investigation. One note of caution, however, as levels can be raised in comorbid illness, age, renal failure and obesity and therefore correlation should be made with the clinical scenario.

In practice as this patient has had a previous MI, according to the current NICE guidelines he needs specialist assessment and Doppler echocardiography within 2 weeks. However, as this is not an option, BNP is the best available answer. BNP is used first line in patients who have not had a previous MI. Levels >400pg/ml warrant urgent specialist assessment and echocardiography; intermediate levels (100-400pg/ml) should be investigated within six weeks.

FBC, U&E and creatinine, CRP and clotting screen are non-specific investigations which are unlikely to directly lead to a diagnosis in this case.



[Q: 3445] OnExamination 2012 - Basic Science

Which of the following is most likely be associated with hyperkalaemia?

- 1- Bartter's syndrome
- 2- Beta adrenergic stimulation
- 3- Cushing's syndrome
- 4- Cyclosporin
- 5- Mannitol

Answer & Comments

Answer: 4- Cyclosporin

Common causes of hyperkalaemia include:

Impaired renal excretion: renal failure, hyporeninaemic hypoaldosteronism (type IV renal tubular acidosis), Addison's, C-21 hydroxylase deficiency.

Cellular changes: acidosis, rhabdomyolysis, tumour lysis, malignant hyperthermia, burns.

Drugs: potassium retaining diuretics, angiotensin-converting enzyme (ACE) inhibitors, non-steroidal anti-inflammatory drugs (NSAIDs), cyclosporin, succinyl choline, β -blockers.



[Q: 3446] OnExamination 2012 - Basic Science

Which of the following statements is true concerning gamma glutamyl transferase (GGT)?

- 1- Increased GGT is found in fatty liver
- 2- Isolated elevation of gamma GT in a patient with prostatic carcinoma Indicates the presence of hepatic metastases.
- 3- It is a better indicator of infectious hepatitis than of cholestasis
- 4- It is only present in the liver
- 5- Serum activity is typically elevated in pregnancy

Answer & Comments

Answer: 1- Increased GGT is found in fatty liver

GGT is found in muscle, prostate as well as liver.

Increased levels of GGT are found in cholestatic liver disease and in hepatocellular disease when there is an element of cholestasis.

Levels are increased with chronic intake of excess alcohol and with certain drugs (especially phenytoin), as a result of enzyme induction. Pancreatitis and prostatitis may also be associated with increased levels.

Levels may be normal early in the course of acute hepatocellular damage, for example, acute viral hepatitis, paracetamol hepatotoxicity.

Elevations in pregnancy would suggest liver disease.



[Q: 3447] OnExamination 2012 - Basic Science

A 46-year-old man was seen for an insurance medical examination.

He was entirely asymptomatic, but his serum urate concentration was noted to be 0.5 mmol/L (0.23 - 0.46).

What is the most appropriate management for this patient?

- 1- Allopurinol
- 2- Colchicine
- 3- Ibuprofen
- 4- Lifestyle intervention
- 5- Sulphinpyrazone

Answer & Comments

Answer: 4- Lifestyle intervention

Uric acid is the major product produced from the catabolism of purines, adenosine monophosphate (AMP) and guanosine monophosphate (GMP) from nucleic acids.

GMP and AMP are catabolised by a series of enzymes which remove a single phosphate group and the ribose sugar, eventually forming xanthine. Xanthine is then converted to uric acid by the enzyme xanthine oxidase. Uric acid can then be excreted by the kidneys.

When uric acid levels are high, there is a risk of developing gout, which causes monoarticular inflammation, gouty arthropathy and tophaceous deformity. Xanthine oxidase inhibitors are used in the treatment of gout, to reduce the amount of uric acid formed.

The patient above requires lifestyle advice about reducing intake of substances containing high purines (including some alcohol and red meat). Should he become symptomatic, treatment would be advisable. In acute gout, treatment is with NSAIDs or other anti-inflammatories such as colchicine.

A xanthine oxidase inhibitor such as allopurinol should be started after the acute attack to reduce the risk of recurrence.

Causes of hyperuricaemia include:

Increased formation of uric acid:

Primary:

Idiopathic and inherited metabolic disease

Secondary:

Alcohol

Psoriasis

Increased nucleic acid turnover: leukaemia and myeloma

Tissue hypoxia

Excess dietary purine intake.

Decreased excretion of uric acid:

Primary:

Idiopathic

Secondary:

Acute or chronic renal disease
Organic acidosis: lactate, ketones
Lead poisoning
Drugs: aspirin and thiazides
Down's syndrome.



[Q: 3448] OnExamination 2012 - Basic Science

Metabolic alkalosis is characteristically found in which of the following?

- 1- An infusion of sodium chloride
- 2- Ileostomy
- 3- Mineralocorticoid deficiency
- 4- Pyloric stenosis
- 5- Salicylate poisoning

Answer & Comments

Answer: 4- Pyloric stenosis

Pyloric stenosis is associated with vomiting and the loss of stomach content - hence a metabolic alkalosis.

Normal saline has a pH of 5 and may produce a mild metabolic acidosis with significant infusions.

Ileostomy may be associated with a loss of bicarbonate ions and hence acidosis.

Mineralocorticoid excess (Conn's syndrome) is also associated with a metabolic alkalosis.

Salicylates are themselves acidic and produce a metabolic acidosis.



[Q: 3449] OnExamination 2012 - Basic Science

A 75-year-old man presents with a long history of shortness of breath and ankle oedema.

His serum biochemistry shows sodium 122 mmol/L (137-144) and potassium of 2.9

mmol/L (3.5-4.9). He now complains of weakness.

Which of the following is likely to explain the above biochemical picture?

- 1- Addison's disease
- 2- Diuretic therapy
- 3- Nephrotic syndrome
- 4- Primary hyperaldosteronism
- 5- SIADH

Answer & Comments

Answer: 2- Diuretic therapy

The long history of his symptoms and serum biochemistry suggests that his condition is due to treatment with furosemide for congestive cardiac failure (CCF).

Primary hyperaldosteronism is associated with high aldosterone, suppressed renin, low potassium and normal/high sodium. Clinically it causes hypertension and is often asymptomatic.

Addison's disease - glucocorticoid and mineralocorticoid deficiency - is classically associated with low sodium and high potassium.

Nephrotic syndrome is not associated with hyponatraemia and hypokalaemia in early stages although if there is reduced glomerular filtration rate (GFR) hyperkalaemia can result. Glomerular disease allows the release of proteins into the urine but electrolytes are reabsorbed.

SIADH would not explain the hypokalaemia.



[Q: 3450] OnExamination 2012 - Basic Science

A 72-year-old man is found to have the following biochemistry:

Calcium 1.98 mmol/L (2.2-2.6)

Phosphate 0.55 mmol/L (0.8-1.4)

Alkaline phosphatase 450 U/L (60-110)

Which of the following is the most likely explanation for his biochemistry?

- 1- Osteomalacia
- 2- Osteoporosis
- 3- Paget's disease
- 4- Renal failure
- 5- Tertiary hyperparathyroidism

Answer & Comments

Answer: 1- Osteomalacia

Osteomalacia is associated with low calcium and phosphate with raised alkaline phosphatase. Parathyroid hormone (PTH) would be high.

Serum biochemistry is normal in osteoporosis, although alkaline phosphatase can be elevated following a fracture.

Paget's disease is associated with normal calcium and phosphate with raised alkaline phosphatase.

In chronic renal failure there is inadequate 1-alpha hydroxylation of vitamin D, preventing the formation of active 1,25 dihydroxy vitamin D. This results in a low serum calcium and a compensatory high PTH (secondary and tertiary hyperparathyroidism). Phosphate is elevated due to altered excretion.



[Q: 3451] OnExamination 2012 - Basic Science

An Afro-Caribbean male aged 48 years presents with gradual onset of exertional dyspnoea, non-productive cough, malaise, weight loss and polyarthralgia.

Schirmer's test indicates a dry eye. x Ray of the hand shows punched out osteopenic lesions.

Which of the following investigations is unlikely to be helpful in establishing the diagnosis of this condition?

- 1- Quantitative immunoglobulins.
- 2- Serum calcium
- 3- Serum phosphorus
- 4- Thallium scan
- 5- Urea and electrolytes

Answer & Comments

Answer: 4- Thallium scan

This condition is sarcoidosis.

Serum calcium, serum phosphorus, chem7 and chem 20 and quantitative immunoglobulins are all used in establishing the diagnosis. Gallium scan is helpful in sarcoidosis. (Radiology of extrathoracic sarcoid ...)

Gallium scan vs. Thallium scan.

Gallium scan (radioactive ⁶⁷Ga) is used to detect inflammation - such as in inflammatory disorders or malignancy.

Thallium (radioactive ²⁰¹Tl) is a potassium analogue and is used to demonstrate areas of poor perfusion. It is particularly used in cardiology to detect areas of ischaemia.



[Q: 3452] OnExamination 2012 - Basic Science

With which of the following is lipoprotein lipase deficiency associated?

- 1- Abetalipoproteinaemia
- 2- Combined hyperlipidaemia
- 3- Familial combined hyperlipidaemia
- 4- Familial hypercholesterolaemia
- 5- Marked hypertriglyceridaemia

Answer & Comments

Answer: 5- Marked hypertriglyceridaemia

Lipoprotein lipase deficiency is autosomal recessive and associated with increased

chylomicrons and marked hypertriglyceridaemia.



[Q: 3453] OnExamination 2012 - Basic Science

A 37-year-old man presents with an anterior myocardial infarction.

He admits to smoking 20 cigarettes per day. His lipid screening on admission reveals total cholesterol of 9.5 mmol/l, triglycerides are at the upper end of the normal range.

Which of the following is the most likely abnormality?

- 1- Apolipoprotein A mutation
- 2- Apolipoprotein B mutation
- 3- HDL receptor mutation
- 4- LDL receptor mutation
- 5- Triglyceride receptor mutation

Answer & Comments

Answer: 4- LDL receptor mutation

Abetalipoproteinaemia leads to the absence of low-density lipoprotein (LDL).

Apolipoprotein A mutations result in defective high-density lipoprotein (HDL).

HDL receptor mutations result in increased levels of HDL, triglyceride receptor mutations in increased levels of triglycerides.



[Q: 3454] OnExamination 2012 - Basic Science

You are doing a stint in chemical pathology and are asked to review the evening's significantly abnormal results.

One set from a 72-year-old man particularly concerns the laboratory staff:

Investigations show:

Haemoglobin 12.9 g/dl (13.5-17.7)

White cell count $8.0 \times 10^9/L$ (4-11)

Platelets $158 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (135-146)

Potassium 2.5 mmol/l (3.5-5)

Bicarbonate 14 mmol/l (22-30)

Creatinine 133 $\mu\text{mol/l}$ (79-118)

Which of the following is the most likely diagnosis?

- 1- Addison's disease
- 2- Bartter's syndrome
- 3- Conn's syndrome
- 4- Gitelman's syndrome
- 5- Ureteric diversion

Answer & Comments

Answer: 5- Ureteric diversion

Ureteric diversion results in metabolic acidosis because implantation of the ureters into the sigmoid colon or a vesicocolic leads to absorption of Cl^- in exchange for HCO_3^- across the bowel mucosa. Absorption of urinary NH_4^+ in the sigmoid colon may also contribute to the development of acidosis as metabolism of the ammonium in the liver results in production of H^+ .

Addison's can result in hyperkalaemia, hyponatraemia and metabolic acidosis.

Conn's leads to hypokalaemic metabolic alkalosis.

Bartter's and Gitelman's also lead to hypokalaemic metabolic alkalosis in the absence of hypertension in contrast to Conn's.



[Q: 3455] OnExamination 2012 - Basic Science

A pregnant woman is referred with an elevated alkaline phosphatase (ALP) level. Her other liver function tests are normal. She is otherwise well.

What is the most likely cause?

- 1- Autoimmune hepatitis
- 2- Bone metastases
- 3- Paget's disease
- 4- Placental production of ALP
- 5- Transient hyperphosphatasia of infancy

Answer & Comments

Answer: 4- Placental production of ALP

Alkaline phosphatase is a common part of the liver function tests and is an enzyme occurring in many different tissues throughout the body. The causes of an elevated ALP are therefore quite diverse.

In practice, most abnormalities of ALP concentration relate to isoenzymes from the liver or bone but the placenta also can make ALP. Thus in pregnant women ALP levels are usually two to three times higher than non-pregnant values: this is quite normal.

In childhood elevated ALP levels signify bone growth and are usually physiological, not pathological. Transient hyperphosphatasia of infancy involves more dramatic elevations of ALP (up to ten times normal) which is thought to be benign in nature and resolves after three to four months. It affects children aged around 2-4-years-old.

Liver disease: ALP is closely associated with the biliary canaliculi in the liver and will rise with any form of hepatobiliary obstruction, particularly with extrahepatic causes such as pancreatic carcinoma or a gallstone in the common bile duct.

When drainage of bile is obstructed ALP synthesis increases dramatically. Liver diseases which predominantly cause hepatocellular damage (such as viral or autoimmune hepatitis) rather than biliary obstruction will cause a lesser degree of ALP elevation.

Bone disease: ALP aids in the calcification process in bone and is found in osteoblasts.

ALP can therefore be abnormal in any disease affecting bone turnover and calcification, including Paget's disease, vitamin D deficiency, primary and secondary hyperparathyroidism, bone malignancies and fracture healing.

Paget's disease involves increased bone turnover and is a relatively common finding in older patients (more than 50-years-old). It can be asymptomatic or can be associated with tender bone/skull over-growth, sensorineural deafness, pathological fractures and rarely, high output cardiac failure.



[Q: 3456] OnExamination 2012 - Basic Science

The enterohepatic circulation primarily involves which part of the gastrointestinal tract?

- 1- Anus
- 2- Jejunum
- 3- Pancreas
- 4- Rectosigmoid junction
- 5- Terminal ileum

Answer & Comments

Answer: 5- Terminal ileum

The enterohepatic circulation is a means of recycling some of the waste materials excreted in the bile.

At the level of the terminal ileum, bile salts and some of the bilirubin derivatives are reabsorbed and return to the liver in the portal circulation. This process is regulated by a number of transporter proteins both in the liver canaliculi and in the ileum.

Bacterial flora in the colon also facilitate the enterohepatic circulation of bilirubin derivatives. Some bacteria contain the enzyme beta-glucuronidase which converts conjugated bilirubin to unconjugated

bilirubin, which is more lipid-soluble and more easily reabsorbed.



[Q: 3457] OnExamination 2012 - Basic Science

Oxygen-requiring metabolic reactions occur predominantly in which type of liver cells?

- 1- Ito (stellate) cells
- 2- Zone 1 hepatocytes
- 3- Kupffer cells
- 4- Zone 2 hepatocytes
- 5- Zone 3 hepatocytes

Answer & Comments

Answer: 2- Zone 1 hepatocytes

The liver is made up of many small subunits called acini. Each acinus has a dual blood supply from firstly, a branch of the hepatic artery (oxygen rich) and secondly, a branch of the portal vein (solute rich). The blood from these flows through the hepatic sinusoids which allow quite free movement of solutes and oxygen from the blood cells into the hepatocytes. Eventually the blood joins a venule and drains into the hepatic vein and back to the systemic circulation.

Hepatocytes near the hepatic arterial supply and portal vein supply (periportal region) are called zone 1 hepatocytes. Zone 3 hepatocytes are furthest from the arterial supply and closest to the branch of the hepatic vein (perivenular region). Zone 2 hepatocytes are in the middle.

Zone 1 hepatocytes receive an oxygen-rich, solute-rich supply which makes them highly metabolically active, but more at risk of damage through the effects of toxins coming from the gut. Most of the highly-oxygen-requiring reactions occur here, including the electron transport chains, Krebs' cycle, fatty acid oxidation and urea synthesis.

Zones 2 and 3 receive less oxygen and tend to be involved in reactions requiring little or no oxygen, such as glycolysis.

Ito cells store fats and vitamin A and are involved in production of connective tissue. In liver disease, they are thought to be fundamental in the development of fibrosis and cirrhosis.

Kupffer cells are part of the reticuloendothelial system and are specialised macrophages. They are involved in the breakdown of haemoglobin and the removal of haem for further metabolism in the hepatocytes. Kupffer cells also have a role in immunity.



[Q: 3458] OnExamination 2012 - Basic Science

Which of the following statements regarding glucagon-like peptide 1 (GLP-1) effects in humans is correct?

- 1- GLP-1 increases the rate of gastric emptying
- 2- GLP-1 inhibits glucose-induced insulin secretion
- 3- GLP-1 is secreted predominantly by pancreatic islet cells
- 4- GLP-1 reduces satiety in the brain
- 5- GLP-1 suppresses postprandial glucose secretion

Answer & Comments

Answer: 5- GLP-1 suppresses postprandial glucose secretion

GLP-1 is an incretin hormone which promotes glucose induced insulin release from the pancreatic beta cell.

GLP-1 delays the rate of gastric emptying, and promotes satiety and reduces the appetite in the brain.

GLP-1 enhances glucose dependent beta cell secretion of insulin and is predominantly secreted by the L cells of ileum and colon.

GLP-1 suppresses glucagon secretion from pancreatic a-cells in a glucose-dependent manner, suppressing hepatic glucose output, thus lowering plasma glucose levels.

Currently the synthetic GLP-1 analogue, exenatide is licensed for combination therapy in the management of type 2 diabetes.



[Q: 3459] OnExamination 2012 - Basic Science

Apoptosis is induced by which of the following?

- 1- Activation of caspases
- 2- Antibodies
- 3- DNA synthesis
- 4- Necrosis
- 5- The MAP kinase pathway

Answer & Comments

Answer: 1- Activation of caspases

A key event in the initiation of apoptosis is the activation of a cascade of cysteine-aspartate specific proteases known as caspases.



[Q: 3460] OnExamination 2012 - Basic Science

A 17-year-old female is affected by an inherited disorder. She has two brothers who are unaffected. She has two sisters both are affected. Her father is affected but not her mother.

Which of the following modes of inheritance is the best explanation?

- 1- Autosomal dominant
- 2- Autosomal recessive
- 3- Mitochondrial

4- X linked dominant

5- X linked recessive

Answer & Comments

Answer: 4- X linked dominant

This is a tricky question and the crucial part is recognising that X linked dominant conditions are transmitted by a father to all his daughters and that, on balance, this is a better explanation of the genetics than the tenuous assertion that an autosomal dominant condition has by chance affected three daughters but neither of two sons.

X linked dominant disorders are rare (for example, vitamin D-resistant rickets). They affect both sexes but females more than males.

All children of a homozygous mother are affected.

Half the sons and half the daughters inherit the disorder from an affected mother with the trait.

An affected father passes the disease to all his daughters but none of his sons - as in this example.



[Q: 3461] OnExamination 2012 - Basic Science

Which of the following disorders is characterised by an autosomal recessive mode of inheritance?

- 1- Achondroplasia
- 2- Congenital adrenal hyperplasia
- 3- Familial hypercholesterolaemia
- 4- Hereditary haemorrhagic telangiectasia
- 5- Huntington's disease

Answer & Comments

Answer: 2- Congenital adrenal hyperplasia

All the others are autosomal dominant.



[Q: 3462] OnExamination 2012 - Basic Science

A 34-year-old man with polycystic kidney disease attends the transplant clinic with his 19-year-old brother.

His most recent creatinine has been measured at 342 $\mu\text{mol/l}$, and he is on several anti-hypertensive drugs and erythropoietin injections to maintain his haemoglobin, which was recently measured as 10.4 g/l.

On examination his BP is 149/87 mmHg. Other findings are consistent with chronic renal failure. His father had end stage renal failure for some years before his death.

Which of the following most accurately reflects the chances of his brother being able to donate a kidney to him?

- 1- 0%
- 2- 25%
- 3- 33%
- 4- 50%
- 5- 100%

Answer & Comments

Answer: 4- 50%

Polycystic kidney disease (PCKD) carries an autosomal dominant inheritance pattern. As such, with one affected parent, each child has a 50% chance of inheriting the PCKD gene.

Whilst ultrasound is very sensitive in detection of PCKD in patients over 20, in those under 20 it is not 100% accurate.

It may not seem immediately obvious to consider a family member as a potential donor, but they may be a valuable source for a kidney in this situation.



[Q: 3463] OnExamination 2012 - Basic Science

A 25-year-old male presents with symptoms of gait ataxia and pes cavus. His father

developed similar symptoms at the age of 36.

Which of the following genetic phenomena explains the age of his presentation?

- 1- Anticipation
- 2- Complex traits
- 3- Epistasis
- 4- Expansion
- 5- Microdeletion

Answer & Comments

Answer: 1- Anticipation

A phenomenon whereby the symptoms of a condition appear at an earlier age when inherited in the next generation is termed anticipation.

These conditions are almost exclusively associated with trinucleotide repeat sequences and examples are Huntington's disease, myotonic dystrophy, and Friedreich's ataxia, as is probably the case in this patient.



[Q: 3464] OnExamination 2012 - Basic Science

Which of the following is a polygenic disorder?

- 1- Ankylosing spondylitis
- 2- Erythropoietic porphyria
- 3- Fragile X syndrome
- 4- Huntington's disease
- 5- Pendred's syndrome

Answer & Comments

Answer: 1- Ankylosing spondylitis

Unlike the other conditions, no one specific genetic defect has been identified to account for ankylosing spondylitis.

Huntington's chorea is an autosomal dominant condition.

Fragile X syndrome is due to a trinucleotide repeat at the FMR 1 gene on the X chromosome.

Erythropoietic porphyria is an autosomal recessive condition, as is Pendred's syndrome.



[Q: 3465] OnExamination 2012 - Basic Science

Which one of the following conditions is a polygenic disorder?

- 1- Amyotrophic lateral sclerosis (ALS)
- 2- Congenital adrenal hyperplasia (CAH)
- 3- Friedreich's ataxia
- 4- Huntington's disease
- 5- Klinefelter's syndrome

Answer & Comments

Answer: 1- Amyotrophic lateral sclerosis (ALS)

All the other conditions are associated with a specific gene defect - CAH and Friedreich's being autosomal recessive with Huntington's being dominant.

Klinefelter's is due to a chromosomal abnormality, XXY.

No specific defect has been detected thus far with ALS.



[Q: 3466] OnExamination 2012 - Basic Science

With respect to lipoprotein transport and metabolism in the body, the following statements are correct, except which?

- 1- Arterial walls contain cells with LDL receptors
- 2- Cholesterol is required for the formation of red blood cell membranes
- 3- Chylomicrons are synthesised in the liver
- 4- HDL is assembled in the extracellular space

- 5- VLDL transformation to LDL occurs in the liver

Answer & Comments

Answer: 3- Chylomicrons are synthesised in the liver

Chylomicrons are formed in the gut from exogenous triacylglycerols and cholesterol.

They are released into the lymph and thereby enter the blood.

They are not formed in the liver.



[Q: 3467] OnExamination 2012 - Basic Science

A 59-year-old woman has had insulin dependent diabetes mellitus for over two decades. The degree of control of her disease is characterised by the laboratory finding of a HbA1c of 10.1%.

She complains of repeated episodes of abdominal pain following meals. These episodes have become more frequent and last for longer periods over the last couple of months.

On physical examination, there are no abdominal masses and she has no enlarged liver, spleen or kidneys and no tenderness to palpation.

Which of the following findings is most likely to be present?

- 1- Acute pancreatitis
- 2- Chronic renal failure
- 3- Hepatic infarction
- 4- Mesenteric artery occlusion
- 5- Ruptured aortic aneurysm

Answer & Comments

Answer: 4- Mesenteric artery occlusion

Diabetes - especially type 2 diabetes - is associated with macrovascular disease.

Smoking is a further risk factor for macrovascular atherosclerosis.

After a meal splanchnic blood flow is increased. If the mesenteric artery is occluded the lack of blood flow to the bowel will produce ischaemic type pain.

Chronic renal failure may be present but would not cause post prandial pain.

Ruptured aortic aneurysm would normally present acutely with hypotension, cold lower limbs with reduced pulses and a pulsatile, tender abdominal mass.

Pancreatitis is unlikely given the history and the lack of epigastric tenderness.

Hepatic infarction should lead to right upper quadrant pain.



[Q: 3468] OnExamination 2012 - Basic Science

In meiosis which of the following is true?

- 1- Anaphase lag results in one of the two daughter cells receiving an extra part of one chromosome.
- 2- At the beginning of meiosis 2, each cell contains 23 single chromosomes.
- 3- DNA replication occurs during meiosis 1.
- 4- Non-disjunction at mitosis (meiosis 2) results in mosaicism.
- 5- The incidence of Down's syndrome due to translocation increases with increasing maternal age.

Answer & Comments

Answer: 4- Non-disjunction at mitosis (meiosis 2) results in mosaicism.

Meiosis is the form of cell division that produces gametes. It is divided into two parts, meiosis 1 and meiosis 2.

Deoxyribonucleic acid (DNA) replication occurs before meiosis 1, and the cell begins

division with twice the normal cellular amount of DNA.

In meiosis 1, each daughter cell gets one of the duplicated chromosomes of each pair. At the beginning of meiosis 2, each cell contains 23 chromosomes each with a duplicated pair of chromatids.

In meiosis 2, the duplicated pair separate and each daughter cell ends up with one of each of the 23 chromosomes (4 haploid daughter cells).

Two common errors of cell division occurring during meiosis are non-disjunction (2 chromosomes fail to separate, so both copies of the chromosome go to one of the daughter cells); and anaphase lag in which a chromatid is lost because it fails to move quickly enough during anaphase to become incorporated into one of the new daughter cells.

In Down's syndrome, non-disjunction accounts for 94% of cases. The incidence of this increases with increasing maternal age. Five per cent of cases are due to translocation, and 1% to mosaicism.



[Q: 3469] OnExamination 2012 - Basic Science

Regarding benign essential tremor which of the following is true?

- 1- Alcohol improves the tremor
- 2- Is autosomal recessive in inheritance
- 3- Is present characteristically at rest
- 4- Occurs in liver disease
- 5- Occurs with lesion in sub thalamus

Answer & Comments

Answer: 1- Alcohol improves the tremor

There is no tremor at rest, but a rhythmic oscillation develops when the patient holds the arms outstretched.

A positive family history is obtained in over half of such patients and the pattern of inheritance in such families indicates an autosomal dominant trait.

Alcohol suppresses essential tremor, but the mechanism responsible is unknown.



[Q: 3470] OnExamination 2012 - Basic Science

A 15-year-old boy comes to the dermatology clinic as his parents are concerned about some changes they have noticed in his skin. He is from a travelling community, and as such his parents have previously shunned medical services.

On examination you notice that he has a number of facial and periungual fibromata. He also has a number of hypomelanotic areas (at least four) on examination of his skin. You also notice gingival fibromata and pitting of his tooth enamel on examination of his mouth.

On which chromosome is the abnormality associated with this disease likely to be found?

- 1- Chromosome 2
- 2- Chromosome 6
- 3- Chromosome 9
- 4- Chromosome 11
- 5- Chromosome 12

Answer & Comments

Answer: 3- Chromosome 9

This boy has tuberous sclerosis, which is inherited in autosomal dominant fashion, with responsible defects having been identified on both chromosome 9 and chromosome 16. These chromosomes carry codes for hamartin and tuberin, protein gene products which are responsible for regulation of cell growth.

Most of the tumours which are produced in tuberous sclerosis are hamartomas, and various phenotypes of the disease occur, with some parents of patients having much more subtle features than those seen in their children.



[Q: 3471] OnExamination 2012 - Basic Science

Autosomal recessive conditions include which of the following?

- 1- Huntington's chorea
- 2- Manic depression
- 3- Turner's syndrome
- 4- Vitamin D resistant rickets
- 5- Wilson's disease

Answer & Comments

Answer: 5- Wilson's disease

Vitamin D resistant rickets are X linked dominant.

No linkage has been established for a particular gene in manic depressive disorder.



[Q: 3472] OnExamination 2012 - Basic Science

Which of the following is not true regarding the polymerase chain reaction?

- 1- It can be used to detect the presence of viral DNA in human disease
- 2- It is used to amplify DNA but not RNA
- 3- It utilises the thermostable properties of Taq DNA polymerase
- 4- Synthetic short DNA primers which flank the sequence of interest are required to initiate the amplification
- 5- The amount of DNA required makes it unsuitable for early prenatal diagnosis

Answer & Comments

Answer: 5- The amount of DNA required makes it unsuitable for early prenatal diagnosis

Reverse transcription polymerase chain reaction (rt-PCR) is used to amplify RNA rather than PCR specifically.

Preimplantation diagnosis uses IVF and genetic analysis of 3-day-old embryos before selective transfer of unaffected embryos to uterus.



[Q: 3473] OnExamination 2012 - Basic Science

Mutation in which of the following is associated with Alport syndrome?

- 1- Collagen type I gene
- 2- Collagen, type IV, alpha 5 gene
- 3- Fibrillin- gene
- 4- FMR-1 gene
- 5- Type II procollagen gene

Answer & Comments

Answer: 2- Collagen, type IV, alpha 5 gene

Mutations in the COL4A5 gene cause approximately 80% of Alport syndrome cases.

Several hundred different mutations have been identified, the majority of which cause a change in the sequence of amino acids (the building blocks of proteins) in a region of the alpha5(IV) collagen chain that is critical for combining with other type IV collagen chains.

Other mutations severely decrease or prevent the production of the alpha5(IV) chains.

As a result, there is a serious deficiency of the type IV collagen network in the basement membranes of the kidney, inner ear, and eye.



[Q: 3474] OnExamination 2012 - Basic Science

A 29-year-old male presents to you seeking advice regarding starting a family.

He has common variable immunodeficiency and wants to know what is the risk of passing this on to his children?

- 1- Less than 5%
- 2- 25%
- 3- 33%
- 4- 50%
- 5- Over 70%

Answer & Comments

Answer: 1- Less than 5%

Common variable immunodeficiency involves low levels of most or all of the immunoglobulin classes, a lack of B lymphocytes or plasma cells that are capable of producing antibodies, and is associated with frequent bacterial infections.

The cause of CVID is unknown - a family member may be affected in approximately 20% but there is no clear pattern of inheritance.



[Q: 3475] OnExamination 2012 - Basic Science

Which of the following abnormalities is associated with short stature?

- 1- 45, XO karyotype
- 2- 47, XXY karyotype
- 3- 47 XYY karyotype
- 4- Fragile X syndrome
- 5- Homocystinuria

Answer & Comments

Answer: 1- 45, XO karyotype

Turner's syndrome, 45 XO, is characteristically associated with short stature.

Klinefelter's is associated with tall stature.

In Fragile X, height is usually unaffected and homocystinuria may have a Marfan's habitus.



[Q: 3476] OnExamination 2012 - Basic Science

Which of the following is characteristically inherited in an autosomal recessive manner?

- 1- Achondroplasia
- 2- Adult polycystic kidney disease (APKD)
- 3- C1 esterase deficiency
- 4- Familial hypercholesterolaemia
- 5- Friedreich's ataxia

Answer & Comments

Answer: 5- Friedreich's ataxia

Achondroplasia, APKD, C1 esterase deficiency (hereditary angio-oedema) and familial hypercholesterolaemia are usually inherited as autosomal dominant traits.

Friedreich's ataxia is characteristically an autosomal recessive inheritance.



[Q: 3477] OnExamination 2012 - Basic Science

In X linked recessive inheritance, which of the following is true?

- 1- Daughters of affected males will all be carriers
- 2- Each daughter of a female carrier has a 1:4 risk of being a carrier
- 3- Each son of a female carrier has a 1:4 risk of being affected
- 4- The family history is often positive since new mutations are rare
- 5- The male to female ratio is 2:1

Answer & Comments

Answer: 1- Daughters of affected males will all be carriers

Over 250 X linked recessive disorders have been described.

The commonest include:

Red/green colour blindness

Duchenne and Becker muscular dystrophies

Fragile X syndrome

G6PD deficiency

Haemophilias A and B

Hunter's syndrome.

The abnormal gene is carried on the X chromosome, and in the carrier female, the normal allele on her other X chromosome protects her from the disease. Since the male does not have this protection, he manifests the disease.

In X linked inheritance therefore:

Males are all affected

Females only occasionally show mild sign of disease

Each son of a female carrier has a 1:2 chance of being affected

Each daughter of a female carrier has a 1:2 risk of being a carrier

Daughters of affected males will all be carriers, but sons of affected males will not be affected since the Y chromosome is derived from father.

The family history may be negative, however, since new mutations are fairly common.

Carrier females can be identified from time to time from mild clinical manifestations and from specific tests such as biochemical markers, for example, creatine kinase in Duchenne muscular dystrophy.



[Q: 3478] OnExamination 2012 - Basic Science

Which of the following disorders is characterised by an autosomal dominant mode of inheritance?

- 1- Beta-thalassaemia
- 2- Cystic fibrosis
- 3- Marfan syndrome
- 4- Wilson's disease
- 5- Xeroderma pigmentosa

Answer & Comments

Answer: 3- Marfan syndrome

Apart from Marfan syndrome, all the other listed options are autosomal recessive.



[Q: 3479] OnExamination 2012 - Basic Science

You are reviewing the results of a clinical trial of a new agent for treating type 2 diabetes mellitus. There are a number of analyses presented as part of the study.

Which of the following would be considered the most robust?

- 1- All patients who took one dose of medication
- 2- Intention to treat
- 3- One month completer
- 4- Per protocol
- 5- Trial completer

Answer & Comments

Answer: 2- Intention to treat

The intention to treat (ITT) analysis contains all the patients randomised to a particular therapy regardless of whether they received it or not. ITT is considered to be the analysis which is least subject to bias.

Completer analyses, whether they took one dose of medication, one month of medication or completed the study, are subject to degrees of bias.

A per protocol analysis may exclude patients who suffered an event but then did not follow the protocol accurately, for example, a patient treated with the diabetes agent who was admitted to hospital, but missed one to two doses of medication.



[Q: 3480] OnExamination 2012 - Basic Science

One of the scientists at your university claims to have discovered a new mutation screen which is useful for the diagnosis of a particular subtype of chronic myeloid leukaemia (CML).

The prevalence of this subtype is 10% of all cases of CML, and the test has a sensitivity of 100% with a specificity of 97%.

Which of the following approximates most closely to the positive predictive value?

- 1- 100%
- 2- 97%
- 3- 77%
- 4- 27%
- 5- 10%

Answer & Comments

Answer: 3- 77%

Out of every 100 patients screened with CML, you would expect 10 of them to have the particular subtype (true positives). False positives will be 3/100.

The positive predictive value is the percentage of true positives out of total positives, which is

$$10 / 13 = 77\%.$$

The negative predictive value is the percentage of true negatives out of total negatives.



[Q: 3481] OnExamination 2012 - Basic Science

A 23-year-old male is diagnosed with diabetes. He has frontal balding, and tells you that he has previously been diagnosed with a cardiomyopathy.

Which of the following genetic phenomena is associated with this genetic condition?

- 1- Chromosome instability
- 2- Deletion
- 3- Epistasis
- 4- Microdeletion
- 5- Trinucleotide repeats

Answer & Comments

Answer: 5- Trinucleotide repeats

The suggestion here is that the patient has myotonic dystrophy.

Myotonic dystrophy is autosomal dominant and exhibits anticipation as the number of trinucleotide repeats undergo triplet expansion, resulting in the disease presenting at a younger age, or with greater disease severity along the generations.

Examples of chromosome instability syndromes are:

Fanconi anaemia

Ataxia telangiectasia

Bloom syndrome.



[Q: 3482] OnExamination 2012 - Basic Science

Mutation in which of the following is associated with Ehlers-Danlos syndrome?

- 1- Collagen type 1 gene

- 2- FGFR3 gene
- 3- Fibrillin- gene
- 4- FMR-1 gene
- 5- Type II procollagen gene

Answer & Comments

Answer: 1- Collagen type 1 gene

Mutations in the following genes cause Ehlers-Danlos syndrome:

ADAMTS2

COL1A1

COL1A2

COL3A1

COL5A1

COL5A2

PLOD1

TNXB.

Ehlers-Danlos occurs in 1:5000 people worldwide.

In view of the wide number of mutations that can cause Ehlers-Danlos syndrome, this is a very heterogeneous condition.

FGFR3 is implicated in achondroplasia

Fibrillin gene in Marfan's syndrome and

FMR-1 gene fragile X mental retardation 1.



[Q: 3483] OnExamination 2012 - Basic Science

Mutation in which of the following is associated with Marfan's syndrome?

- 1- Collagen type 1 gene
- 2- Collagen type 5 gene
- 3- Fibrillin-1 gene
- 4- FMR-1 gene
- 5- Type II procollagen gene

Answer & Comments

Answer: 3- Fibrillin-1 gene

Mutation in the fibrillin-1 gene is thought to be responsible for Marfan's syndrome.

In Marfan's syndrome the lack of normal fibrillin-1 leads to overactivity of transforming growth factor type beta

(TGF- β) in the wall of the aorta and the heart valves, leading to damage and destruction to the connective tissue which weakens that aortic wall and heart valves causing them to stretch.

Type 1 collagen gene defects are found in osteogenesis imperfecta and type 3 in Ehlers-Danlos syndrome.

Type II procollagen defect is found in hereditary spodyloarthropathy.



[Q: 3484] OnExamination 2012 - Basic Science

A 22-year-old female is diagnosed with cystinuria following recurrent episodes of renal colic.

Which of the following is characteristic of cystinuria?

- 1- Autosomal dominant inheritance
- 2- Cataracts
- 3- Cystine deposition within the liver
- 4- Premature coronary artery disease
- 5- Radio-opaque renal calculi

Answer & Comments

Answer: 5- Radio-opaque renal calculi

Cystinuria is an autosomal recessive condition associated with the inadequate reabsorption of cystine (as well as ornithine, arginine, and lysine; useful mnemonic COAL) in the nephron causing nephrolithiasis. The stones are at least partially radio-opaque.

It accounts for less than 3% of renal calculi and has an incidence of 1 in 2,500.

The foundation of cystine stone prevention is adequate hydration and urinary alkalinisation.



[Q: 3485] OnExamination 2012 - Basic Science

A 28-year-old lady presents with multiple cafe au lait spots.

A diagnosis of neurofibromatosis (NF) type 1 is made.

Which of the following is true of the NF1 gene?

- 1- Inherited in a recessive fashion
- 2- Inherited in an X linked fashion
- 3- On chromosome 17
- 4- On mitochondrial genome
- 5- Related to NF2 gene

Answer & Comments

Answer: 3- On chromosome 17

Neurofibromatosis due to NF1 is found on chromosome 17 and is inherited in an autosomal dominant fashion.

NF2 is associated with acoustic neuromas and is found on chromosome 22.



[Q: 3486] OnExamination 2012 - Basic Science

Which of the following organelles contains enzymes responsible for the digestion of constituents of cells and tissues?

- 1- Endoplasmic reticulum
- 2- Golgi apparatus
- 3- Lysosomes
- 4- Microtubules
- 5- Mitochondria

Answer & Comments

Answer: 3- Lysosomes

The lysosomes contain the enzymes and molecules such as oxidases, free radical, etc, responsible for the breakdown of intracellular components.

Microtubules are involved in mitotic processes and intracellular transportation.

The mitochondria produce energy for cellular functions.



[Q: 3487] OnExamination 2012 - Basic Science

Are the following true concerning anti-neutrophilic cytoplasmic autoantibodies?

- 1- ANCA positive glomerulonephritis characteristically causes nephrotic syndrome
- 2- Cause neutropenia in SLE
- 3- Increased in systemic lupus erythematosus (SLE)
- 4- Positive only in Wegener's syndrome associated with renal disease
- 5- Present in inflammatory bowel disease

Answer & Comments

Answer: 5- Present in inflammatory bowel disease

Eighty five percent of untreated subjects with Wegener's will have circulating anti-neutrophil cytoplasmic antibody (cANCA) and those with limited disease are less likely to have positive serology.

Perinuclear anti-neutrophil cytoplasmic antibody (pANCA) is present in approximately 70% with ulcerative colitis and less than 20% of Crohn's patients.

Neither p nor c-ANCA is typical of SLE.

Initial renal damage causes proteinuria (focal proliferative glomerulonephritis) but renal function can deteriorate rapidly with development of acute focal necrotising glomerulonephritis.



[Q: 3488] OnExamination 2012 - Basic Science

A 20-year-old South Asian man presents to the emergency department with a six week history of fever, night sweats and weight loss.

Chest x ray reveals bilateral upper zone cavitory lesions.

What is the next most important investigation?

- 1- CT scan of chest
- 2- HIV test
- 3- Interferon-gamma releasing assay (IGRA)
- 4- Sputum for acid fast bacilli (AFB) examination
- 5- Sputum for M/C&S

Answer & Comments

Answer: 4- Sputum for acid fast bacilli (AFB) examination

Laboratory confirmation enables speciation and susceptibility data to be obtained.

HIV testing should be offered to all patients with TB but is not the next most important investigation.



[Q: 3489] OnExamination 2012 - Basic Science

A 24-year-old female presents with a two day history of a painful swollen erythematous left leg.

On examination, she is confused and hypotensive.

What is the likeliest cause of her infection?

- 1- Group G Streptococcus

- 2- Mixed coliforms and anaerobes
- 3- MRSA
- 4- Clostridium perfringens
- 5- S. pyogenes

Answer & Comments

Answer: 5- S. pyogenes

S. pyogenes (group A Streptococcus) is the likeliest cause.

Mixed coliforms and anaerobes and group G Streptococci occur more commonly in older patients with underlying co-morbidities.



[Q: 3490] OnExamination 2012 - Basic Science

A nurse presents with severe swelling around the mouth following her lunch.

She was treated for suspected anaphylaxis and on further questioning she says that previously she has had an itchy rash on her hands after wearing latex gloves.

Which of the following fruit is the most likely to have been in her lunch to explain this reaction?

- 1- Apple
- 2- Banana
- 3- Gooseberry
- 4- Pineapple
- 5- Star fruit

Answer & Comments

Answer: 2- Banana

"Latex allergy represents an increasing occupational problem, mainly among healthcare workers. An association between latex allergy and hypersensitivity to some plant foods, particularly fruits (the latex-fruit syndrome), has been established. Class I chitinases with an N-terminal hevein-like domain from avocado, chestnut, banana and

other foods, and latex hevein seem to be the allergens responsible for the cross-reactions involved in the latex-fruit syndrome." Salcedo G, Diaz-Perales A, Sanchez-Monge R. The role of plant panallergens in sensitization to natural rubber latex. Curr Opin Allergy Clin Immunol. 2001 Apr;1(2):177-83.



[Q: 3491] OnExamination 2012 - Basic Science

A 45-year-old lady presented with a four month history of malaise, weight loss and, more recently, dyspnoea.

Clinical examination and CXR reveals a pleural effusion and malignancy is suspected as an underlying cause. Tumour markers are requested as part of the workup.

Investigation shows:

CA 15-3 9 U/ml (< 40)

CA 19-9 60 U/ml (< 33)

CA125 620 U/ml (< 35)

Which of the following diagnoses is the most likely?

- 1- Breast cancer
- 2- Hepatoma
- 3- Ovarian fibroma
- 4- Pancreatic cancer
- 5- Small cell lung cancer

Answer & Comments

Answer: 3- Ovarian fibroma

The combination of raised CA 125, pleural effusion and history suggestive of malignancy makes the diagnosis of ovarian fibroma and Meig's disease the most likely of those listed.

CA 15-3 is a tumour marker for breast cancer.

CA- 19-9 is a pancreatic cancer marker.



[Q: 3492] OnExamination 2012 - Basic Science

A 52-year-old man enquired about the advisability of vaccination prior to a holiday abroad.

He had been treated for asthma with long term steroids and regularly required doses of prednisolone in excess of 30 mg daily to control acute exacerbations.

Which one of the following vaccinations would be contraindicated in this man?

- 1- Bacillus Calmette-Guérin - BCG
- 2- Diphtheria toxoid
- 3- H. influenzae B
- 4- Meningococcus
- 5- Tetanus toxoid

Answer & Comments

Answer: 1- Bacillus Calmette-Guérin - BCG

Some individuals, particularly those that are immunosuppressed, are at risk if they are given live vaccines.

Inactivated vaccines are generally not dangerous but may be ineffective.

They are also at risk of severe manifestations to vaccines such as disseminated infection with bacillus Calmette-Guérin (BCG).

Those patients who receive prednisolone 40 mg/day for more than a week or who are on lower doses for more prolonged periods should be considered to be immunosuppressed.

Asthma alone is not a contraindication to vaccination even if patients are taking inhaled corticosteroids.



[Q: 3493] OnExamination 2012 - Basic Science

A 47-year-old woman presents with high fever, rigors and myalgia.

Nasal aspirate is positive for influenza virions.

Which of the following is true of her B cell response?

- 1- Affinity maturation takes place in the blood stream
- 2- Deficiency of either CD40 or CD40L still allows an IgG response
- 3- Her B cells express immunoglobulin on their surface
- 4- Memory cells are not formed as repeated infections with influenza often occur
- 5- The antibody response to the virus does not require T cell help

Answer & Comments

Answer: 3- Her B cells express immunoglobulin on their surface

B cells usually require T cell help for full activation.

B cells activated in the primary immune response initially produce IgM. With continuing T cell help B cells then undergo heavy chain class switching and enter germinal centres in secondary lymphoid organs. The germinal centres are the sites of immunoglobulin affinity maturation and memory B cell formation.

Various factors including the nature of T cell help, antigen exposure site and cytokine profile, determine the isotype of heavy chain produced.

CD40 and CD40L are required for co-stimulation by T cells. Deficiency of either CD40 or CD40L impairs class switching.

Certain antigens can activate B cells in the absence of T cell help - thymus independent antigen. T cell independent B cell responses are mainly to carbohydrate antigen, for example, pneumococcal polysaccharide. These antigens are not processed and presented in association with MHC molecules, and therefore cannot activate T helper cells.

Most TI antigens have highly repetitive epitopes (for example, LPS/endotoxin), which are able to cross link B cell surface immunoglobulin and activate these cells.

Some T cell independent antigens can cause proliferation of B cells regardless of their specificity - polyclonal B cell activation. B cell responses to T independent antigens consist mainly of IgM antibodies of low affinity without the production of memory cells.

The influenza virus will activate T and B cells, and result in memory cell production.

Genetic mutation in the virus is responsible for immune evasion and repeated infections.



[Q: 3494] OnExamination 2012 - Basic Science

A 53-year-old woman presents with a six month history of recurrent facial and tongue swelling.

She associated the attacks with consuming certain food additives and with contact with some cosmetics and cleaning fluids. Her only regular medication was hormone replacement therapy.

Investigations reveal:

Total serum IgE 145 kU/L (0-120)

Serum C₃ 105 mg/dL (65-190)

Serum C₄ 35 mg/dL (15-50)

What is the most likely diagnosis?

- 1- C1 esterase inhibitor deficiency
- 2- Chemical intolerance
- 3- Food allergy
- 4- Idiopathic angio-oedema
- 5- Mastocytosis

Answer & Comments

Answer: 3- Food allergy

The history suggests atopy which is confirmed by the mildly elevated IgE concentration and normal C₄ and C₃ concentrations.

Hereditary or acquired angio-oedema is unlikely given the normal C₄ and the history occurs late. Also the patient herself has noticed a link with food - food allergy is usually easier to diagnose in adults.

The cosmetics (chemical intolerance) are unlikely and the clinical history does not fit mastocytosis.



[Q: 3495] OnExamination 2012 - Basic Science

Which of the following is a typical feature of farmer's lung?

- 1- Basal crackles
- 2- Eosinophilia
- 3- Haemoptysis
- 4- Increased pCO₂
- 5- Positive serum paraproteins

Answer & Comments

Answer: 1- Basal crackles

Farmer's lung is the commonest occupational extrinsic allergic alveolitis, due to thermophilic actinomycetes.

Crackles are typically heard at the bases. Other signs depend on the stage of disease.

In the acute form, the symptoms usually start 4- hours after exposure to the sensitising antigen. There is malaise, fever, chest tightness, dry cough, and dyspnoea. Signs include tachypnoea and bibasal fine inspiratory crackles; wheeze is rare. Life-threatening respiratory failure can develop.

In the subacute form, symptoms are less severe and include a productive cough, dyspnoea, fatigue, anorexia and weight loss. There are often recurrent attacks, which may present as pneumonia. After the exposure is

removed it can take weeks or months for the symptoms to resolve.

In the chronic form there are minimal systemic symptoms, but marked limitation of exercise tolerance due to dyspnoea. If the source of the antigen is removed there is usually only partial improvement of symptoms. Cyanosis, cludding and inspiratory crackles over the lower lung fields may be present. Eventually chronic hypoxia and pulmonary hypertension with right heart failure develop. There may be acute exacerbations.

Eosinophilia can be seen but is not typical.

Immunoglobulin levels are frequently elevated but not a paraprotein.

P02 may be decreased particularly with exercise.

A restrictive pattern on LF studies is seen.



[Q: 3496] OnExamination 2012 - Basic Science

Which one of the following statements concerning T lymphocytes is correct?

- 1- Are infected by Epstein-Barr virus in infectious mononucleosis
- 2- Are the primary host response in bacterial infection
- 3- Compose the majority of lymphocytes in plasma
- 4- Produce IgG
- 5- T cell lymphoma has a better prognosis than B cell lymphoma

Answer & Comments

Answer: 3- Compose the majority of lymphocytes in plasma

The primary host response to bacterial infections is dependent on mononuclear phagocytes and neutrophils.

T lymphocytes are involved in cell-mediated acquired immune responses, whereas B lymphocytes are involved in humoral immunity and produce immunoglobulins.

T lymphocytes compose the majority of circulating lymphocytes in plasma.

Epstein-Barr virus infects B lymphocytes and squamous epithelial cells of the oropharynx. The virus can transform B cells and epithelial cells to produce Burkitt's lymphoma, a subset of Hodgkin's lymphoma, nasopharyngeal carcinoma and oral hairy leukoplakia.

T cell lymphoma makes up about 10-20% of non-Hodgkin's lymphomas and has a worse prognosis than B cell lymphoma.



[Q: 3497] OnExamination 2012 - Basic Science

A 24-year-old pregnant female delivers at term by normal vaginal delivery.

Antenatal screening for hepatitis B had revealed the following results:

Hepatitis B core Ab positive

Hepatitis B surface Ag positive

Hepatitis BeAg negative

What are the most appropriate measures to reduce the risk of mother to child transmission?

- 1- Accelerated hepatitis B immunisation at 0,1,2 and 12 months
- 2- Accelerated hepatitis B immunisation and hepatitis B immunoglobulin
- 3- Advise against breast feeding
- 4- Hepatitis B immunisation at 0,1 and 6 months
- 5- Offer reassurance

Answer & Comments

Answer: 1- Accelerated hepatitis B immunisation at 0,1,2 and 12 months

Accelerated hepatitis B immunisation is preferable to routine immunisation to prevent neonatal infection.

Hepatitis B immunoglobulin should also be administered only if the neonate has a low birth weight or the mother is a chronic carrier of high infectivity (hepatitis B eAg positive).

Advising against breast feeding does not reduce the risk of neonatal infection.



[Q: 3498] OnExamination 2012 - Basic Science

A 75-year-old man has a history of chronic lymphocytic leukaemia. He has had treatment with several courses of chemotherapy and has now been admitted to hospital with pneumonia.

His medical history revealed that he had suffered several previous upper respiratory tract infections over the previous six months.

Which of the following components of his immune system is likely to be deficient?

- 1- Complement
- 2- Immunoglobulin G
- 3- Macrophages
- 4- Mast cells
- 5- T lymphocytes

Answer & Comments

Answer: 2- Immunoglobulin G

Chronic lymphocytic leukaemia (CLL) is commonly complicated by panhypogammaglobulinaemia.

Although intravenous immunoglobulin prevents recurrent infections it does not prolong survival.



[Q: 3499] OnExamination 2012 - Basic Science

A 25-year-old sexually active Afro-Caribbean

female presents with a non-traumatic swollen left knee.

A knee aspirate reveals numerous polymorphs and gram negative diplococci.

What is the likeliest cause of infection?

- 1- H. influenzae
- 2- N. gonorrhoeae
- 3- N. meningitidis
- 4- S. aureus
- 5- S. pyogenes

Answer & Comments

Answer: 2- N. gonorrhoeae

Although all the above organisms may cause septic arthritis, only Neisseria species are gram-negative diplococci.

Given the above clinical scenario, the likeliest cause is gonorrhoea rather than meningococcal disease.



[Q: 3500] OnExamination 2012 - Basic Science

A 34-year-old female is admitted to hospital with neutropenic sepsis following recent chemotherapy for acute myeloid leukaemia. Cultures are taken and she is commenced on intravenous tazobactam/piperacillin and gentamicin.

Five days later her fever is still persisting and a chest x ray reveals patchy infiltrates throughout both lung fields.

What is the likeliest diagnosis?

- 1- Hospital-acquired bacterial pneumonia
- 2- Influenza
- 3- Invasive aspergillosis
- 4- PCP
- 5- Pulmonary TB

Answer & Comments

Answer: 3- Invasive aspergillosis

Most neutropenic sepsis protocols recommend the addition of an antifungal agent, generally liposomal amphotericin B, to empirical antibacterial treatment after three days to cover this possibility.



[Q: 3501] OnExamination 2012 - Basic Science

A healthcare worker sustained a needle stick injury from a known HIV seropositive patient not taking antiretroviral therapy.

Assuming the healthcare worker is HIV seronegative, what is the risk of transmission?

- 1- 1/3
- 2- 1/30
- 3- 1/300
- 4- 1/3000
- 5- 1/30000

Answer & Comments

Answer: 3- 1/300

This is an estimated risk based on retrospective case-control studies.

Evaluating risk is important when counselling a patient and deciding when to offer post-exposure prophylaxis.



[Q: 3502] OnExamination 2012 - Basic Science

A 62-year-old man who has recently had his medication for hypertension altered presents with flushing, stridor, shortness of breath and hypotension.

He comes to the emergency department and receives intravenous hydrocortisone, intramuscular adrenaline, and intravenous antihistamine. After a slow recovery he is

discharged home for planned review at the allergy clinic.

Which of the following medications is most likely to be responsible for his presentation?

- 1- Amlodipine
- 2- Atenolol
- 3- Bendroflumethiazide
- 4- Doxazosin
- 5- Ramipril

Answer & Comments

Answer: 5- Ramipril

This man has presented with anaphylaxis.

Whilst angio-oedema may be hereditary or idiopathic, it is also associated with use of both ACE inhibitors and angiotensin receptor blockers (ARB). Given that he has recently increased his anti-hypertensive medication, presentation with angio-oedema associated with ACE inhibitor therapy seems the most likely explanation.

He should cease ramipril therapy and not commence either ACE inhibitors or ARBs in the future.



[Q: 3503] OnExamination 2012 - Basic Science

A 24-year-old nurse is admitted to the Emergency department with symptoms of anaphylaxis. She is known to be allergic to latex and collapsed whilst having a fruit salad for her lunch with colleagues. You suspect that she has the latex fruit syndrome.

On examination her BP is 95/60 mmHg and her pulse is 105. She has audible stridor and a very flushed facial appearance. She responds to treatment with IV hydrocortisone, nebulised salbutamol and s/c adrenaline.

Which of the following inflammatory mediators is thought to be important in anaphylaxis?

- 1- IL1
- 2- IL2
- 3- IL4
- 4- IL6
- 5- IL10

Answer & Comments

Answer: 3- IL4

Mediators involved in the development of anaphylaxis include histamine, leukotrienes, prostaglandins and platelet aggregating factor, which are generated by mast cell degranulation.

Additional factors include

Tryptase

Chimase

Heparin

Chondroitin sulphate

IL4

IL13.

IL4 and IL13 are thought to be important in driving the onward cascade of inflammation to other immune system cells and contribute to the severity of anaphylaxis.



[Q: 3504] OnExamination 2012 - Basic Science

Class I major histocompatibility complexes (MHCs) react with which of the following on T cells to result in immune system activation?

- 1- CD 1
- 2- CD 2
- 3- CD 5
- 4- CD 8
- 5- CD 10

Answer & Comments

Answer: 4- CD 8

Proteins are displayed on the cell surface by MHC I human leukocyte antigen (HLA) antigens.

If the MHC I is presenting material recognised as foreign, then it is detected and destroyed by CD 8 plus T cells.



[Q: 3505] OnExamination 2012 - Basic Science

Class II major histocompatibility complexes (MHCs) are present on which of the following cells?

- 1- B cells
- 2- Erythrocytes
- 3- Natural killer cells
- 4- Platelets
- 5- Resting T cells

Answer & Comments

Answer: 1- B cells

Class II MHCs are present on all antigen presenting cells, for example,

B cells

Dendritic cells

Macrophages

Langerhans cells.

They are also present on activated T cells.



[Q: 3506] OnExamination 2012 - Basic Science

The Mantoux reaction is an example of which type of hypersensitivity reaction?

- 1- Humoral immune response
- 2- Type I hypersensitivity
- 3- Type II hypersensitivity

- 4- Type III hypersensitivity
- 5- Type IV hypersensitivity

Answer & Comments

Answer: 5- Type IV hypersensitivity

The tuberculin skin test is an example of a type IV hypersensitivity or a delayed type hypersensitivity (DTH) reaction. This reaction develops when primed Th1 cells encounter their specific antigen. An inflammatory response evolves over 24-72 hours.

In the tuberculin skin test the injected antigen is protein derived from *M. tuberculosis*. Th1 cells recognise peptide bound to major histocompatibility complex on APCs and are activated to secrete pro-inflammatory cytokines including interleukin-2 (IL2), interferon (IFN)-gamma, tumour necrosis factor (TNF), chemokines and granulocyte-macrophage colony-stimulating factor (GM-CSF).

There is recruitment of inflammatory cells, predominantly macrophages, to the site of antigen deposition with activation of phagocytes.

Some cytokines (TNF) as well as macrophage derived lytic enzymes cause local tissue destruction. CD8+ T-cells have also been implicated in DTH responses. The result is an indurated erythematous lesion at the site of injection which indicates previous exposure to TB.



[Q: 3507] OnExamination 2012 - Basic Science

Are the following true regarding leukotrienes?

- 1- Are formed from the cyclo-oxygenase pathway
- 2- Are synthesised by fibroblasts
- 3- Decrease vascular permeability

- 4- Leukotriene D4 has been identified as SRS-A which causes bronchial wall smooth muscle relaxation
- 5- Stimulate mucus secretion

Answer & Comments

Answer: 5- Stimulate mucus secretion

Leukotrienes are synthesised by leucocytes.

They are mediators of allergic reaction.

They increase vascular permeability and attract neutrophils and eosinophils to inflammatory sites.

Leukotrienes are synthesised via the lipoxygenase pathway.

Leukotriene D4 has been identified as SRS-A which causes bronchial wall and intestinal smooth muscle contraction (not dilatation).

Leukotrienes also stimulate mucus production, an important consideration in the pathophysiology of bronchial asthma.



[Q: 3508] OnExamination 2012 - Basic Science

A healthcare worker sustained a needle stick injury from a known hepatitis B chronic carrier of high infectivity.

Assuming the healthcare worker is susceptible to hepatitis B, what is the risk of transmission?

- 1- 1/3
- 2- 1/30
- 3- 1/300
- 4- 1/3000
- 5- 1/30000

Answer & Comments

Answer: 1- 1/3

This is an estimated risk based on retrospective case-control studies.

Evaluating risk is important when counselling a patient.

The patient should be offered hepatitis B immunoglobulin and an accelerated course of hepatitis B vaccine.



[Q: 3509] OnExamination 2012 - Basic Science

Which of the following is true regarding the genetics of bronchial asthma?

- 1- Genetic linkage is to a single chromosome 13
- 2- Leukotriene concentrations are influenced by genetic factors
- 3- Mendelian recessive inheritance
- 4- Similar concordance in monozygotic and dizygotic twins
- 5- There is a contribution from HLA alleles

Answer & Comments

Answer: 5- There is a contribution from HLA alleles

There may be genetic linkage of atopic trait to chromosome 11, with association between response to antigen and HLA haplotype.

IgE concentrations are influenced by genetic factors.



[Q: 3510] OnExamination 2012 - Basic Science

A 43-year-old United Kingdom born HIV seropositive patient is admitted to hospital with a three week history of fever, weight loss and night sweats. He had been non-compliant with his antiretroviral therapy.

On admission CD4 count was $35 \times 10^6/l$ and CXR normal.

What is the likeliest cause of his fevers?

- 1- Cryptococcus neoformans
- 2- Mycobacterium avium

- 3- Mycobacterium tuberculosis
- 4- Salmonella enteritidis
- 5- Streptococcus pneumoniae

Answer & Comments

Answer: 2- Mycobacterium avium

As the CD4 count is less than $100 \times 10^6/l$, this is a typical presentation for disseminated Mycobacterium avium infection.

Mycobacterium tuberculosis is possible but less likely as the patient is UK born and CXR normal.

Streptococcus pneumoniae is likely to present as an acute respiratory illness and Cryptococcus neoformans as meningitis.

Salmonella enteritidis is possible but less likely than disseminated Mycobacterium avium infection.



[Q: 3511] OnExamination 2012 - Basic Science

A 45-year-old female presents with symptoms and signs suggestive of a pyelonephritis.

A MSU reveals +++ WBCs and a heavy growth of an extended spectrum beta-lactamase (ESBL) producing Escherichia coli is isolated.

What is the most appropriate treatment?

- 1- Amoxicillin
- 2- Ciprofloxacin
- 3- Co-amoxiclav
- 4- Imipenem
- 5- Trimethoprim

Answer & Comments

Answer: 4- Imipenem

An ESBL is an enzyme that inactivates most beta-lactamase antibiotics.

These organisms are often resistant to other antibiotics such as trimethoprim and ciprofloxacin.

Beta-lactam/beta-lactam inhibitor combinations such as co-amoxiclav may have some activity but are unreliable when used to treat severe infections.



[Q: 3512] OnExamination 2012 - Basic Science

Which one of the following is correct concerning mast cells?

- 1- Are lipophilic cells involved in inflammatory and immune responses
- 2- Cross-linkage of surface IgA molecules by antigen may cause an anaphylactic reaction
- 3- Degranulation releases lytic enzymes and inflammatory mediators from storage granules
- 4- Depletion of circulating mast cells can cause mastocytosis
- 5- Do not contain heparin

Answer & Comments

Answer: 3- Degranulation releases lytic enzymes and inflammatory mediators from storage granules

Mast cells are basophilic cells in the connective and subcutaneous tissues, which are involved in inflammatory and immune responses.

They contain storage granules that contain lytic enzymes (for example, tryptase) and inflammatory mediators, for example:

Histamine

Heparin

5-Tryptase hydroxytryptamine (5-HT)

Leukotrienes

Platelet aggregating factor

Leukocyte chemotactic factor

Hyaluronidase.

Release of these mediators occurs during mast cell degranulation, which can be triggered by:

Tissue injury

Drugs

Complement activation

Foreign antigenic material.

An anaphylactic reaction occurs when a previously sensitised individual is re-exposed to the antigen. It is an IgE mediated immune response.

Mastocytosis occurs when excess mast cells are present in the circulation or as tissue infiltrates.



[Q: 3513] OnExamination 2012 - Basic Science

A 22-year-old female develops a wheeze and extensive rash whilst eating a Chinese take-away.

On examination, she has extensive wheeze and stridor, with urticaria covering her upper and lower limbs and trunk. Her BP is 80/45 mmHg.

What is the likely diagnosis?

- 1- C1 esterase deficiency
- 2- Food poisoning
- 3- Idiopathic urticaria
- 4- Monosodium glutamate syndrome
- 5- Peanut allergy

Answer & Comments

Answer: 5- Peanut allergy

Chinese cooking uses cashew nuts in many dishes, and patients with peanut allergy may also experience an anaphylactic reaction with cashew nuts. Chinese chefs also use peanut oil

in the stir fry, and this may also precipitate an allergic reaction.

An acute hypersensitivity reaction to monosodium glutamate (MSG) a flavour enhancer common in Chinese food, may give rise to the 'MSG syndrome'. This is characterised by

A sudden onset of headache

Heartburn

Palpitations

Sweating

Swelling

Flushing of the face.

Patients may report a sense of increased facial pressure or tingling in the face. Symptoms generally start within two hours of eating foods rich in MSG. This condition is generally self-limited and will resolve. Antihistamines can be helpful in some cases.

It is extremely unlikely that this syndrome will cause shock, which is what this patient presents with given the hypotension.



[Q: 3514] OnExamination 2012 - Basic Science

Which of the following statements regarding B-type natriuretic peptide (BNP) is correct?

- 1- BNP augments sodium reabsorption in the kidney
- 2- BNP causes arterial and venous smooth muscle vasodilatation
- 3- BNP is synthesised predominantly in the cerebrovascular circulation
- 4- BNP synthesis is decreased by thyroid hormone
- 5- The stimulus for BNP release is increased ventricular pressure load

Answer & Comments

Answer: 2- BNP causes arterial and venous smooth muscle vasodilatation

The ventricular myocardium is the primary site of BNP synthesis.

The stimulus for BNP release is myocyte stretch, rather than transmural pressure load.

BNP synthesis is increased by thyroid hormones as well as glucocorticoids, endothelin-1, angiotensin-II and tachycardia, independent of the haemodynamic effects of these factors.

In the kidney, BNP causes increased glomerular filtration rate (GFR) and inhibition of sodium reabsorption, leading to natriuresis and diuresis.

BNP leads to reduced blood pressure, and reduced pre-load due to relaxing effects on vascular smooth muscle.

For an informative review refer to Lancet 2003;362:316-22.



[Q: 3515] OnExamination 2012 - Basic Science

A 55-year-old nurse developed bronchospasm and urticaria twenty minutes into surgery under general anaesthesia.

The mast cell tryptase concentration confirmed an acute allergic reaction.

Later, it transpired that she had developed allergic reactions at her dentist and had developed frequent episodes of wheezing when assisting at sterile procedures.

What is the most likely diagnosis?

- 1- Allergy to anaesthetic induction agents
- 2- Allergy to local anaesthetic agents
- 3- Latex allergy
- 4- Pressure urticaria
- 5- Systemic mastocytosis

Answer & Comments

Answer: 3- Latex allergy

This patient developed anaphylaxis during a surgical procedure and it appears that she had problems with allergies during dental treatment and whilst assisting during sterile procedures.

This would suggest that she is allergic to latex rather than induction agents or local anaesthesia as latex would be present in all three of the above procedures.

Systemic mastocytosis is a disease which usually affects the elderly and is associated with:

Urticaria pigmentosa

Diarrhoea

Hypotension

Sclerotic bone changes and

Mast cell infiltration of organs such as spleen, liver and kidneys.



[Q: 3516] OnExamination 2012 - Basic Science

Which of the following statements is true of xenotransplantation?

- 1- Has not yet been performed in humans
- 2- Is characterised by a vigorous early cell-mediated immune response
- 3- Is the transfer of organs between species
- 4- Is the transfer of tissue grown in-vitro
- 5- Requires a close HLA match

Answer & Comments

Answer: 3- Is the transfer of organs between species

Xenotransplantation is the transfer of organs between species - particularly the transfer of animal organs to humans. Compare this with

allotransplantation which is the transfer of organs within the same species.

There have already been several documented cases of xenotransplantation - baboon heart, chimpanzee kidneys.

A close human leukocyte antigen (HLA) match is not possible of course, unless a transgenic species is used that express human major histocompatibility complexes (HLA).

Early immune response is humoral - immunoglobulin M (IgM).



[Q: 3517] OnExamination 2012 - Basic Science

Which of the following statements concerning the thymus is true?

- 1- A proportion of alpha/beta+ thymocytes undergo isotype switching to produce gamma/delta+ T cells.
- 2- CD4/CD8 double positive cells are eliminated by a process of negative selection.
- 3- Mature thymocytes express surface IgM and IgD.
- 4- The majority of cortical thymocytes express either CD4 or CD8.
- 5- Thymocytes whose TcR bind with high affinity to self Ag/MHC complexes are clonally deleted.

Answer & Comments

Answer: 5- Thymocytes whose TcR bind with high affinity to self Ag/MHC complexes are clonally deleted.

Cortical thymocytes are immature forms, and either do not express CD4 or CD8 (double negative cells) or express both CD4 and CD8 (double positive cells). As the cells mature, they pass to the thymic medulla, where they lose expression of either CD4 or CD8, to become single positive cells.

Negative selection occurs at the stage when thymocytes express both CD4 and CD8, but co-expression of these markers does not mediate negative selection. Negative selection occurs when a thymocyte expresses a TcR with high affinity for self antigen:MHC complexes in the thymic micro-environment.

Once a thymocyte has successfully rearranged and expressed an alpha/beta or gamma/delta TcR it is committed to that lineage.

Thymocytes whose TcR bind with high affinity to self Ag/MHC complexes are clonally deleted by a process of negative selection.

B cells express IgM and IgD; T cells do not.



[Q: 3518] OnExamination 2012 - Basic Science

A 50-year-old African-American woman presents with episodic toe and finger problems characterised by pallor, cyanosis, suffusion and pain of the fingers and toes in response to cold. She later develops difficulty in swallowing and dyspnoea. Inspiratory crackles are heard on auscultation.

Which of the following immunological investigations is the most specific for this lady's condition?

- 1- Anticentromere antibody
- 2- Anti-ds DNA antibody
- 3- Antitopoisomerase I (Scl-70) antibody
- 4- Rheumatoid factor
- 5- Topoisomerase I

Answer & Comments

Answer: 3- Antitopoisomerase I (Scl-70) antibody

This lady has systemic sclerosis as suggested by the:

Dyspnoea (lung fibrosis or pulmonary hypertension)

Dysphagia (oesophageal involvement) and Raynaud's.

Systemic sclerosis is a chronic autoimmune disease characterised by increased fibroblast activity and fibrosis in a number of different organ systems. Ninety to 95% of patients have positive antinuclear antibodies.

There are two major subtypes:

Limited cutaneous and

Diffuse cutaneous.

CREST syndrome is an older term for the limited cutaneous form (calcinosis, Raynaud's phenomenon, oesophageal dysmotility, sclerodactyly, telangiectasia).

Patients with systemic sclerosis can present with skin abnormalities, musculoskeletal changes, gastrointestinal complications, pulmonary disease, renal crisis and dry eyes and mouth.

A number of autoantibodies against extractable nuclear antigens can be detected in patients with systemic sclerosis. Anti-centromere antibodies and anti-topoisomerase I antibodies are the classic autoantibodies associated with the disease. Anti-centromere antibodies are linked with limited cutaneous involvement and isolated pulmonary hypertension, and a good prognosis, whereas anti-topoisomerase I are linked with diffuse skin disease and pulmonary fibrosis and a higher mortality.

Respiratory symptoms are common in patients with systemic sclerosis, but it is often difficult to distinguish between interstitial lung disease and pulmonary hypertension as the cause. Echocardiography, pulmonary hypertension and chest radiographs or CT are often required.

Inspiratory crackles heard here make interstitial lung disease the most likely diagnosis, but it is important to note they are not always present in the early stages of

disease. Signs of pulmonary hypertension are jugular venous distension, right ventricular heave and an accentuated pulmonary second heart sound.

Anti-ds DNA antibodies are characteristic of systemic lupus erythematosus (SLE). Rheumatoid factor is non-specific, but is associated with rheumatoid arthritis. Topoisomerase III is not an investigation which is routinely used.



[Q: 3519] OnExamination 2012 - Basic Science

A healthcare worker sustained a needle stick injury from a known chronic hepatitis C carrier who has not been previously treated.

Assuming the healthcare worker is hepatitis C negative, what is the risk of transmission?

- 1- 1/3
- 2- 1/30
- 3- 1/300
- 4- 1/3000
- 5- 1/30000

Answer & Comments

Answer: 2- 1/30

This is an estimated risk based on retrospective case-control studies.

Evaluating risk is important when counselling a patient and deciding when to offer post-exposure prophylaxis.



[Q: 3520] OnExamination 2012 - Basic Science

Which of the following cell types have a prime role in recognising and destroying virus infected cells in an HLA class I-restricted manner?

- 1- B cells
- 2- CD8+ T lymphocytes

- 3- Dendritic cells
- 4- Macrophages
- 5- Platelets

Answer & Comments

Answer: 2- CD8+ T lymphocytes

CD8+ T lymphocytes are otherwise known as cytotoxic T lymphocytes.

The T cell receptor on the surface of the CD8+ T cell recognises virus peptides in the context of self HLA class I molecules on the surface of virus infected antigen presenting cells. The infected cell is then lysed.

Dendritic cells are professional antigen presenting cells presenting antigen to CD4+ helper cells and CD8+ T cells, but have no cytotoxic potential.

B cells produce antibodies.

Macrophages are also antigen presenting cells but are also involved in recognition and eradication of certain intracellular pathogens but in a non-HLA restricted manner.



[Q: 3521] OnExamination 2012 - Basic Science

A 45-year old UK born male presents with a swollen left knee two months after an arthroscopy.

A knee aspirate reveals ++PCs and ++ Gram positive cocci in clumps.

What is the likeliest cause of infection?

- 1- H. influenzae
- 2- N. gonorrhoeae
- 3- N. meningitidis
- 4- S. aureus
- 5- S. pyogenes

Answer & Comments

Answer: 4- S. aureus

Although all the above organisms may cause septic arthritis, only *S. aureus* and *S. pyogenes* could cause septic arthritis post procedure.

S. aureus is a far commoner cause than *S. pyogenes*.



[Q: 3522] OnExamination 2012 - Basic Science

A 65-year-old smoker presents to a respiratory clinic with a four week history of cough and weight loss.

CXR appears normal. *Mycobacterium avium* is cultured from a sputum sample.

What is the next appropriate investigation?

- 1- Bronchoscopy
- 2- CT scan of chest
- 3- Interferon-gamma releasing assay
- 4- Sputum for AFB examination
- 5- Sputum for M/C&S

Answer & Comments

Answer: 5- Sputum for M/C&S

To diagnose pulmonary *Mycobacterium avium* infection with confidence, attempts should be made to culture the organism from repeated sputum samples.

A CT scan is the next most important investigation as this may reveal pulmonary infiltrates despite a normal CXR.



[Q: 3523] OnExamination 2012 - Basic Science

Which of the following statements is true about immunological reactions?

- 1- Angioneurotic oedema is the most severe form of type I reaction
- 2- Deficiencies in the terminal components of complement increase the risk of meningococcal disease

- 3- Graves' disease is caused by a type IV reaction
- 4- Serum sickness is caused by a type II reaction
- 5- Urticaria usually responds to cimetidine

Answer & Comments

Answer: 2- Deficiencies in the terminal components of complement increase the risk of meningococcal disease

Serum sickness is due to circulating antibody-antigen complexes (type III).

Graves' disease is due to stimulating antibody (type V).

The most severe variety of type I reaction is anaphylaxis, with angio-oedema an intermediate reaction associated with wheeze and swelling of the lips and severe urticaria. These reactions are mediated by histamine 1 receptor stimulation.

Congenital C1 inhibitor deficiency is also caused by hereditary angio-oedema. Deficiencies in C1r, s, and 2-4 result in vasculitides; while deficiencies in C2, 3 and 5-8 are associated with an increased risk of septicaemia.



[Q: 3524] OnExamination 2012 - Basic Science

A 16-year-old female develops an urticarial reaction and is suspected of peanut allergy yet measurement of peanut-specific IgE antibodies on RAST testing is within the normal range.

Which of the following would be the next most appropriate investigation?

- 1- C1 esterase concentrations
- 2- Food provocation testing
- 3- Mast cell degranulation testing
- 4- No other test necessary diagnosis can be secured on history

5- Skin prick testing

Answer & Comments

Answer: 5- Skin prick testing

The most appropriate next test would be skin allergen testing as a food provocation test is often unnecessary and can prove rather dangerous although it is the gold standard.



[Q: 3525] OnExamination 2012 - Basic Science

A 37-year-old woman underwent a kidney transplant which never functioned.

A biopsy revealed pathological features consistent with acute rejection associated with anti-HLA antibodies.

Which type of immunoglobulin is expected to account for this process?

- 1- Ig A
- 2- Ig D
- 3- Ig E
- 4- Ig G
- 5- Ig M

Answer & Comments

Answer: 4- Ig G

This acute rejection is recognised and due to anti-IgG antibodies to the human leukocyte antigen (HLA) incompatible tissues with primary activation of T cells.

The acute response is treated with immunosuppressants.



[Q: 3526] OnExamination 2012 - Basic Science

A 51-year-old man presents with wheals and urticaria. He takes a variety of medications.

Which drug is the most likely to have caused this reaction?

- 1- Aspirin
- 2- Glyceryl trinitrate
- 3- Omeprazole
- 4- Paracetamol
- 5- Simvastatin

Answer & Comments

Answer: 1- Aspirin

The most likely cause of an urticarial eruption from this list would be aspirin.

Other drugs frequently associated with urticaria include

Non-steroidal anti-inflammatory drugs (NSAIDs)

Penicillin

Angiotensin-converting enzyme (ACE) inhibitors

Thiazides

Codeine.



[Q: 3527] OnExamination 2012 - Basic Science

Which of the following statements regarding the genetic and immunological basis of coeliac disease is correct?

- 1- 50% of patients are HLA-DQ 2 or HLA-DQ 8 positive
- 2- Alpha-gliadin specific CD8 cells can be identified in the intestinal wall of untreated patients with coeliac disease
- 3- Cow's milk proteins may precipitate an immune-related enteropathy indistinguishable from coeliac disease
- 4- Tissue transglutaminase generates the antigenic epitopes present in alpha-gliadin
- 5- TNF-alpha plays a critical role in the inflammatory response in the intestinal wall of patients with untreated coeliac disease

Answer & Comments

Answer: 4- Tissue transglutaminase generates the antigenic epitopes present in alpha-gliadin

The prevalence of coeliac disease is 1% in western societies, and is thus one of the commonest immune-mediated diseases.

It arises as a result of genetic predisposition, at least 95% of patients are HLA-DQ2 or HLA-DQ8 positive, and also from the specific immune response to the alpha-gliadin component of gluten.

Cow's milk can produce an immunologically mediated enteropathy, but the condition is rare and transient.

The action of tissue transglutaminase on alpha-gliadin generates epitopes to CD4+ T lymphocytes, which provoke an inflammatory response in the intestinal wall.

In untreated individuals, alpha-gliadin specific CD4+ T cells can be found producing interferon-gamma in the intestinal wall.



[Q: 3528] OnExamination 2012 - Basic Science

Which of the following concerning IgG is correct?

- 1- It has a molecular weight of 50,000 kd.
- 2- It is monovalent.
- 3- It comprises the majority of circulating antibody in serum.
- 4- It differs from other isotypes in not being able to cross the placental barrier.
- 5- It is the major antibody produced during the primary response.

Answer & Comments

Answer: 3- It comprises the majority of circulating antibody in serum.

A. Each light chain has a MW of 25,000 and each H chain a MW of 50,000. Therefore, since

the whole molecule consists of 2 L and 2 H chains, the MW is 150,000 kd.

B. It exists as a monomer with 2 Fab portions, each of which can interact with an antigenic determinant. Therefore it is divalent.

C. Normal range 8-19 g/l. Next is IgA, 1-5 g/l, followed by IgM 0.5- 2 g/l.

D. It is in fact the only antibody capable of crossing the placental barrier, which it does through gaining attachment via its Fc portion.

E. It is the major antibody produced in the secondary immune response. IgM is the major antibody produced during the primary response.



[Q: 3529] OnExamination 2012 - Basic Science

Which molecule is produced in the nucleus, matures in the cytoplasm, binds to the ribosome and initiates protein synthesis?

- 1- Messenger RNA
- 2- Ribosomal RNA
- 3- RNA nucleotide
- 4- RNA polymerase
- 5- Transfer RNA

Answer & Comments

Answer: 1- Messenger RNA

Protein synthesis consists of two phases.

Transcription is where one strand of the deoxyribonucleic acid (DNA) double helix is used as a template by ribonucleic acid (RNA) polymerase to synthesise messenger RNA from RNA nucleotides.

The mRNA then migrates into the cytoplasm maturing, for example, by the splicing of non-coding sequences.

Translation occurs when the ribosome binds to mRNA at the start codon and transfer RNA brings amino acids into position along the

mRNA template. Ribosomal RNA interacts with transfer RNA during translation by providing peptidyl transferase activity.

The ribosome moves from codon to codon along the mRNA producing a polypeptide sequence.

Each type of RNA consists of nucleotides, which are made up of phosphate, ribose sugar and nitrogen bases.

RNA polymerase is the enzyme which is responsible for synthesizing RNA molecules.



[Q: 3530] OnExamination 2012 - Basic Science

Where does RNA splicing occur?

- 1- Cytoplasm
- 2- Endoplasmic reticulum
- 3- Mitochondria
- 4- Nucleus
- 5- Ribosome

Answer & Comments

Answer: 4- Nucleus

Coding sequence is interrupted by non-coding sequences.

Removal of the introns in RNA transcript modification is called RNA splicing.

Splicing occurs in the nucleus before transport to the cytoplasm.

Exons are expressed sequences: these sequences are those present in mature mRNA.



[Q: 3531] OnExamination 2012 - Basic Science

Which of the following are found in eukaryotic and prokaryotic cells?

- 1- Chromosomes

- 2- Introns
- 3- Linear DNA
- 4- Nuclear membrane
- 5- Ribosomes

Answer & Comments

Answer: 5- Ribosomes

Eukaryotes (higher organisms) have multiple chromosomes in the genome which is separated from the rest of the cell by nuclear membranes.

Prokaryotes lack a membrane bound nucleus, and their DNA occurs in a circular form.

Transcription of eukaryotic genes requires non-coding sequences (introns) in the mRNA to be spliced out before translation at the ribosome.

Both eukaryotes and prokaryotes have a ribosome, though the ribosome is significantly larger in eukaryotes.



[Q: 3532] OnExamination 2012 - Basic Science

In which one of the following conditions is deoxyribonucleic acid (DNA) analysis the most useful diagnostic test?

- 1- Adult polycystic kidney disease
- 2- Down's syndrome
- 3- Huntington's chorea
- 4- Hypertrophic obstructive cardiomyopathy
- 5- Klinefelter's syndrome

Answer & Comments

Answer: 3- Huntington's chorea

Klinefelter's syndrome and Down's syndrome are diagnosed principally by chromosomal analysis/karyotype - XXY in the former and trisomy C21 or translocation in the latter.

A trinucleotide CAG repeat expansion in the Huntington gene is diagnostic of Huntington disease.

The majority of cases of hypertrophic cardiomyopathy (HOCM) are autosomal dominantly inherited yet defective genes are located on a variety of chromosomes.

DNA linkage analysis is used to assist in the diagnosis of adult polycystic kidney disease (PKD) but the presence of multiple copies continues to complicate the development of reagents for direct genetic testing, at least of the 70% of PKD1 that is replicated elsewhere.



[Q: 3533] OnExamination 2012 - Basic Science

Which one of the following has its own self-replicating DNA?

- 1- Golgi body
- 2- Lysosomes
- 3- Mitochondria
- 4- Peroxisome
- 5- Rough endoplasmic reticulum

Answer & Comments

Answer: 3- Mitochondria

Abnormalities of mitochondrial deoxyribonucleic acid (DNA) are associated with

Inherited conditions such as Leber's optic atrophy

Mitochondrial myopathy

Lactic acidosis and stroke-like episodes (MELAS) syndrome, and

Diabetes insipidus, diabetes mellitus, optic atrophy and deafness (DIDMOAD).



[Q: 3534] OnExamination 2012 - Basic Science

Transcription RNA (tRNA) has three bases specific for a particular amino acid with which it binds to messenger RNA (mRNA).

Which of the following is this specific area of tRNA?

- 1- Anticodon
- 2- Codon
- 3- Exon
- 4- Intron
- 5- Transposon

Answer & Comments

Answer: 1- Anticodon

mRNA has codons which are bound by the anticodons on tRNA during translation of protein synthesis.

Exons are coding sequences in the mRNA and introns are areas of unknown function.

Transposons are genetic sequences that have been transposed from one part of DNA to another.



[Q: 3535] OnExamination 2012 - Basic Science

Which of the following is true of restriction enzymes?

- 1- Are involved in cell cycle arrest
- 2- Cut DNA
- 3- Degrade DNA
- 4- Join two pieces of DNA together
- 5- Synthesise DNA

Answer & Comments

Answer: 2- Cut DNA

Restriction enzymes cut deoxyribonucleic acid (DNA) at sequences specific for each

restriction enzyme; they are vital tools for molecular biology and molecular genetic research.



[Q: 3536] OnExamination 2012 - Basic Science

Which of the following is true regarding proteins known as cyclins?

- 1- Are differentially expressed throughout the cell cycle
- 2- Regulate antibody production
- 3- Regulate DNA transcription
- 4- Regulate the cycling of receptors between the cell surface and the cytoplasm
- 5- Regulate the menstrual cycle

Answer & Comments

Answer: 1- Are differentially expressed throughout the cell cycle

Cyclins are key regulators of the cell cycle; different cyclins are expressed at different stages of the cell cycle.



[Q: 3537] OnExamination 2012 - Basic Science

The level of cellular telomerase activity will affect which of the following?

- 1- Cell death
- 2- Cell survival
- 3- RNA synthesis
- 4- The number of cell divisions a cell is capable of undergoing
- 5- The rate of cell growth

Answer & Comments

Answer: 4- The number of cell divisions a cell is capable of undergoing

The telomere is a DNA sequence at the end of each chromosome which becomes

progressively shorter with each division the cell undergoes.

When it is reduced to a critical length the cell is not capable of dividing. The enzyme telomerase is able to lengthen the telomere thus preventing this occurring.



[Q: 3538] OnExamination 2012 - Basic Science

Is it true that phosphorylation of protein tyrosine residues is associated with the following?

- 1- Alzheimer's disease
- 2- Cell signalling pathways
- 3- Creutzfeldt-Jakob disease
- 4- Protein degradation
- 5- Protein synthesis

Answer & Comments

Answer: 2- Cell signalling pathways

Phosphorylation of specific tyrosine residues of components of cell signalling pathways is often a key event in the activation of the pathway.



[Q: 3539] OnExamination 2012 - Basic Science

Northern blotting is a technique that can be used to detect which of the following?

- 1- Antibodies
- 2- DNA
- 3- Plasmids
- 4- Protein
- 5- RNA

Answer & Comments

Answer: 5- RNA

Northern blotting is a means of detecting ribonucleic acid (RNA), frequently used to quantify specific mRNA transcript levels.



[Q: 3540] OnExamination 2012 - Basic Science

Which of the following stimulate the generation of cyclic AMP as the second messenger?

- 1- Cholera toxin
- 2- Growth hormone (GH)
- 3- Nitric oxide
- 4- Pioglitazone
- 5- Tissue necrosis factor (TNF) alpha

Answer & Comments

Answer: 1- Cholera toxin

Nitric oxide generates cyclic guanosine monophosphate (cGMP) as the second messenger and pioglitazone acts through agonism of peroxisome proliferator activating receptor (PPAR) gamma.

Calcitonin cholera toxin binds to the ganglioside receptors and causes excessive production of cyclic adenosine monophosphate (cAMP) which leads to the activation of luminal sodium pumps and the secretory diarrhoea.

GH like TNF alpha acts on the GH/cytokine superfamily of receptors which function via the janus kinases/signal transducers and activators of transcription (JAK-STAT) pathway.



[Q: 3541] OnExamination 2012 - Basic Science

Apoptosis is the process of programmed cell death and occurs in cells that have damaged DNA.

A mediator of this process is a tumour suppressor gene that inhibits mitosis and promotes apoptosis.

This gene is which of the following?

- 1- BCL-2
- 2- Caspases
- 3- Fas (CD95)
- 4- p53
- 5- Ras

Answer & Comments

Answer: 4- p53

BCL-2 is an inhibitor of apoptosis.

Fas is a cell receptor and caspases are present in all cells; both promote apoptosis but are not tumour suppressor genes.

Ras is an oncogene.



[Q: 3542] OnExamination 2012 - Basic Science

A plasmid is best described as which of the following?

- 1- A recombinant section of DNA
- 2- A small viral particle
- 3- Bacterial DNA separate from the chromosome
- 4- Consisting of multiple copies of a single gene
- 5- Having multiple origins of replication

Answer & Comments

Answer: 3- Bacterial DNA separate from the chromosome

Plasmids are circular molecules of bacterial deoxyribonucleic acid (DNA) separate from the bacterial chromosome.

They usually:

Are small

Consist of a few thousand base pairs

Carry one or a few genes, and

Have a single origin of replication.

Genes on plasmids with multiple copies are usually expressed at higher levels.

In nature these genes often encode for proteins such as those needed for bacterial resistance.

Plasmids can be used to clone genes by splicing a particular gene into a plasmid and then allowing the bacteria to multiply - this is then called recombinant plasmid DNA.



[Q: 3543] OnExamination 2012 - Basic Science

The polymerase chain reaction (PCR) is used to amplify small amounts of deoxyribonucleic acid (DNA) for further analysis. First the DNA double helix must be split into two strands.

By which of the following is this achieved?

- 1- Alkali solution
- 2- Centrifugation
- 3- DNA polymerase
- 4- Heating to nearly 100°C
- 5- Viral reverse transcriptase

Answer & Comments

Answer: 4- Heating to nearly 100°C

To the small sample of DNA are added two oligonucleotides with sequences that have affinity for both ends of the area of DNA that is being studied.

A thermostable DNA polymerase is also added.

At 94°C DNA literally melts into two single strands and with cooling the oligonucleotides bind to the areas surrounding the particular area of DNA that is being analysed.

These act as primers for the DNA polymerase and a new double helix of DNA is formed.

The cycle is repeated doubling the amount of DNA each time.



[Q: 3544] OnExamination 2012 - Basic Science

A patient is found to have an acquired syndrome associated with defective breakdown and disposal of intracellular fatty acids.

Which intracellular organelle is concerned with the breakdown of fatty acids?

- 1- Golgi apparatus
- 2- Lysosomes
- 3- Mitochondria
- 4- Peroxisomes
- 5- Smooth endoplasmic reticulum

Answer & Comments

Answer: 4- Peroxisomes

Mitochondria are concerned with aerobic cell respiration and Golgi bodies are likely to be responsible for transporting products synthesised in the smooth endoplasmic reticulum.

Smooth endoplasmic reticulum is a site of lipid synthesis within the cell.

Lysosomes (lysis- breakage, soma- body) contain digestive enzymes which break down expendable cell organelles, engulfed viruses and other intracellular detritus.

Peroxisomes are responsible for the metabolism of fatty acids within cells.



[Q: 3545] OnExamination 2012 - Basic Science

A 59-year-old woman presents with a two week history of back pain.

On admission, WCC is $24 \times 10^9/L$ (4-11). MR scan reveals a thoracic spine discitis associated with an epidural abscess.

What is the likeliest cause?

- 1- Brucella melitensis
- 2- Escherichia coli
- 3- M. tuberculosis
- 4- Methicillin-resistant S. aureus (MRSA)
- 5- Methicillin-sensitive S. aureus (MSSA)

Answer & Comments

Answer: 5- Methicillin-sensitive S. aureus (MSSA)

In the United Kingdom, MSSA is a more common cause of severe community-acquired infections than MRSA.

Brucella and TB can cause osteomyelitis in patients from countries where these infections are endemic but do not cause a raised white cell count.

Escherichia coli is an unlikely cause of vertebral osteomyelitis.



[Q: 3546] OnExamination 2012 - Basic Science

An 80-year-old man is admitted to hospital with a CVA.

Due to incontinence secondary to immobility, a urinary catheter is inserted. Five days later the patient becomes severely septic.

What is the likeliest cause of his sepsis?

- 1- Aspiration pneumonia
- 2- Clostridium difficile diarrhoea
- 3- Infected intravascular catheter
- 4- Infected pressure sores
- 5- Urinary tract infection, catheter associated

Answer & Comments

Answer: 5- Urinary tract infection, catheter associated

Urinary catheters are a risk to patients and should only be inserted in patients to relieve obstruction or when monitoring of urine output is required for medical reasons.



[Q: 3547] OnExamination 2012 - Basic Science

A 69-year-old woman develops a fever 10 days after gastrointestinal surgery. She is receiving total parenteral nutrition (TPN).

Blood cultures grow Candida albicans.

What is the likeliest source of her candidaemia?

- 1- Gastrointestinal (GI) tract
- 2- Intravascular catheter
- 3- None of these
- 4- Sputum
- 5- Urine

Answer & Comments

Answer: 2- Intravascular catheter

Previous GI tract surgery, previous exposure to antibiotics and TPN administered through a central intravascular catheter are risk factors for candidaemia.



[Q: 3548] OnExamination 2012 - Basic Science

A 59-year-old female presents with dizziness, malaise and a fluctuating Glasgow coma score (GCS). CT scan of the head is normal.

CSF examination reveals the following:

WCC 4480 (99% neutrophils) < 1

RCC 700 < 1

Protein 2.02 g/L < 0.4

Glucose 1.4 mmol/L (plasma glucose 5.6 mmol/L)

Blood cultures reveal Gram positive cocci in pairs.

What is the likeliest cause of this patient's meningitis?

- 1- L. monocytogenes
- 2- N. meningitidis
- 3- S. agalactiae
- 4- S. aureus
- 5- Streptococcus pneumoniae

Answer & Comments

Answer: 5- Streptococcus pneumoniae

N. meningitidis is a clinical possibility but these would appear as Gram negative diplococci in blood cultures.

L. monocytogenes are Gram positive rods and a rare cause of meningitis in the elderly or immunocompromised.

S.agalactiae is the commonest cause of late onset neonatal disease and rarely causes meningitis in adults.



[Q: 3549] OnExamination 2012 - Basic Science

A 43-year-old female presents with fever, headache and confusion. CT scan reveals a space occupying lesion.

In theatre, pus is aspirated from the lesion and a Gram stain reveals a large number of polymorphs, and gram positive cocci in chains.

What is the likeliest cause of this brain abscess?

- 1- Enterococcus faecalis
- 2- Group A Streptococci
- 3- Group B Streptococci
- 4- S. milleri
- 5- Streptococcus pneumoniae

Answer & Comments

Answer: 4- S. milleri

The other organisms are not commonly recognised causes of brain abscesses.

Streptococcus milleri is a common cause of brain abscesses and is often associated with sinus infection. Streptococci are gram positive cocci which characteristically form chains (in contrast to staphylococci which clump/cluster).



[Q: 3550] OnExamination 2012 - Basic Science

A 15 week pregnant woman is exposed to a family member with chickenpox.

What is the most appropriate next step?

- 1- Advise serial ultrasound scans
- 2- Check varicella zoster IgG status
- 3- Counsel high risk of congenital varicella syndrome
- 4- Give varicella zoster immunoglobulin (VZIg)
- 5- Reassure

Answer & Comments

Answer: 2- Check varicella zoster IgG status

Despite exposure in the first trimester, the risk of congenital varicella syndrome remains low.

Unlike exposure to Erythrovirus B19, serial ultrasound scans are not recommended.

It is important to elucidate the varicella zoster serostatus of the mother as only if seronegative should varicella zoster IgG be administered. This is provided it is given within 10 days of exposure, the minimum incubation period of chickenpox.



[Q: 3551] OnExamination 2012 - Basic Science

A patient with TB is receiving the following drugs as induction phase during treatment;

rifampicin, isoniazid, pyrazinamide, ethambutol and pyridoxine.

Which drug is most likely to cause peripheral neuropathy?

- 1- Ethambutol
- 2- Isoniazid
- 3- Pyrazinamide
- 4- Pyridoxine
- 5- Rifampicin

Answer & Comments

Answer: 2- Isoniazid

Supplementation with pyridoxine, vitamin B6, reduces the risk.



[Q: 3552] OnExamination 2012 - Basic Science

What is the mechanism of resistance for rifampicin resistant Mycobacterium tuberculosis?

- 1- Alteration in cell wall permeability
- 2- Alteration of the DNA dependent RNA transcriptase
- 3- Alteration of penicillin binding proteins (PBPs)
- 4- Efflux mechanism
- 5- Production of the inactivating enzyme, penicillinase

Answer & Comments

Answer: 2- Alteration of the DNA dependent RNA transcriptase

Rifampicin is a bacteriostatic antibiotic which acts by inhibiting protein synthesis.

Mutations in rpoB gene cause alterations in the bacterial DNA dependent RNA transcriptase which prevents the binding of rifampicin.



[Q: 3553] OnExamination 2012 - Basic Science

What is the mechanism of resistance for penicillin resistant Streptococcus pneumoniae?

- 1- Alteration in cell wall permeability
- 2- Alteration of the DNA dependent RNA transcriptase
- 3- Alteration of penicillin binding proteins (PBPs)
- 4- Efflux
- 5- Production of the inactivating enzyme, penicillinase

Answer & Comments

Answer: 3- Alteration of penicillin binding proteins (PBPs)

Penicillin is a bactericidal antibiotic which acts by inhibiting cell wall synthesis.

Mutations in PBPs, enzymes required for cell wall synthesis, result in penicillin resistance.



[Q: 3554] OnExamination 2012 - Basic Science

A 45-year-old male intravenous drug user (IVDU) presents to hospital with fever and a productive cough.

On examination, a pansystolic murmur is heard at the left sternal edge. CXR reveals multiple cavitary lesions.

What is the likeliest explanation?

- 1- Aortic valve endocarditis with embolisation
- 2- Aspiration pneumonia
- 3- Mitral valve endocarditis with embolisation
- 4- Pulmonary TB
- 5- Tricuspid valve endocarditis with embolisation

Answer & Comments

Answer: 5- Tricuspid valve endocarditis with embolisation

IVDUs are susceptible to *S. aureus* tricuspid valve endocarditis due to auto-inoculation of *S. aureus* during injection.

In IVDUs, pulmonary TB and aspiration pneumonia are less likely causes of multiple pulmonary cavitary lesions.



[Q: 3555] OnExamination 2012 - Basic Science

A patient is diagnosed with an abnormality of oligopeptide disposal.

Which intracellular organelle is associated with the metabolism of oligopeptides?

- 1- Golgi apparatus
- 2- Lysosomes
- 3- Peroxisomes
- 4- Ribosomes
- 5- Smooth endoplasmic reticulum

Answer & Comments

Answer: 2- Lysosomes

Lysosomes (lysis- breakage, soma- body), carry hydrolases that degrade

Nucleotides

Proteins

Lipids

Phospholipids.

They also remove carbohydrate, sulfate, or phosphate groups from molecules.

Ribosomes are intimately associated with the rough endoplasmic reticulum and are responsible for protein translation.

Peroxisomes are responsible for the metabolism of fatty acids within cells.



[Q: 3556] OnExamination 2012 - Basic Science

A 45-year-old Ghanaian man presents to hospital with a right sided middle lobe pneumonia.

Streptococcus pneumoniae is isolated from blood cultures.

What is the likeliest underlying association?

- 1- Common variable immunodeficiency (CVID)
- 2- HIV
- 3- HTLV-1
- 4- IgA deficiency
- 5- Terminal complement deficiency

Answer & Comments

Answer: 2- HIV

Streptococcus pneumoniae, is a Gram-positive diplococcus which is carried asymptomatically in approximately 50% of people. It can cause both non-invasive and invasive disease. Invasive pneumococcal disease (IPD) refers to disease in which the bacterium enters a sterile site such as blood, cerebrospinal fluid, pleural fluid or pericardial fluid. Non-invasive disease includes otitis media, sinusitis, pneumonia and bronchitis. This gentleman has grown the organism from his blood cultures, and therefore has IPD by definition. This is a major cause of morbidity and mortality in children and adults.

Invasive pneumococcal disease (IPD) is 20-30 times more common in HIV infected patients compared to non-HIV infected patients. Consideration should be given to offering HIV testing to all patients with IPD presenting to hospital.

Other immunodeficiency syndromes are associated with an increased risk of IPD, but the majority of these present in childhood. These include X-linked (Bruton's) agammaglobulinaemia, common variable

immunodeficiency, asplenia (anatomical or functional) and sickle cell disease.

The other causes of immunodeficiency are not associated with IPD.



[Q: 3557] OnExamination 2012 - Basic Science

A 45-year-old Indian man is seen by his GP with oropharyngeal candidiasis and treated with fluconazole. One month later he developed a dry cough, night sweats and shortness of breath (SOB) on exertion.

On admission to hospital CXR revealed bilateral ground glass shadowing.

What is the likeliest diagnosis?

- 1- Late onset asthma
- 2- Pneumococcal pneumonia
- 3- Pneumocystis carinii pneumonia (PCP)
- 4- Tuberculosis (TB)
- 5- Viral pneumonitis (H1N1)

Answer & Comments

Answer: 3- Pneumocystis carinii pneumonia (PCP)

HIV diagnoses are often delayed in groups of patients other than sub-Saharan Africans and men who have sex with men.

Guidance in 2008 aimed to reduce barriers to HIV testing but there is still reluctance to offer HIV testing to patients, despite unusual clinical presentations, outside traditional risk groups.



[Q: 3558] OnExamination 2012 - Basic Science

An 85-year-old woman was admitted to hospital complaining of a swollen right leg.

On examination she had extensive right leg erythema with blisters. Subsequently she became confused and hypotensive and was transferred to ITU for ventilation and inotropic support.

What is the likeliest cause of her condition?

- 1- Group C Streptococcus
- 2- Group G Streptococcus
- 3- MRSA
- 4- S. aureus
- 5- S. pyogenes (Group A Streptococcus)

Answer & Comments

Answer: 5- S. pyogenes (Group A Streptococcus)

Groups C and G Streptococci are less virulent than Group A Streptococci and rarely cause severe disease.

Occasionally, S. aureus may cause severe disease but rarely an extensive community-acquired cellulitis.



[Q: 3559] OnExamination 2012 - Basic Science

A multiple drug resistant Escherichia coli was isolated from the urine of a patient with severe sepsis.

What is the likely mechanism of resistance?

- 1- Alteration of drug target
- 2- Drug efflux
- 3- Drug impermeability
- 4- Extended spectrum beta-lactamase (ESBL) production
- 5- Penicillinase production

Answer & Comments

Answer: 4- Extended spectrum beta-lactamase (ESBL) production

Some Escherichia coli isolates produce an ESBL that inactivate second and third generation cephalosporins.

The class of drugs that will most reliably treat these infections are the carbapenems.



[Q: 3560] OnExamination 2012 - Basic Science

A 15 week pregnant woman is exposed to a family member with an erythematous rash. She has previously been immunised with MMR twice.

What is the most appropriate next test?

- 1- CMV IgG
- 2- Erythrovirus B19 IgG
- 3- Measles IgG
- 4- Rubella IgG
- 5- Toxoplasma IgG

Answer & Comments

Answer: 2- Erythrovirus B19 IgG

As she has had two MMR immunisations the patient will be immune against measles and rubella.

If further serological testing demonstrates seroconversion to Erythrovirus B19, the mother should be followed up with serial ultrasound scans.

If hydrops fetalis is detected, intrauterine blood transfusions should be considered.



[Q: 3561] OnExamination 2012 - Basic Science

A 43-year-old Nigerian presents with an eight month history of weight loss, fever and night sweats.

On examination she had left axillary lymphadenopathy.

What is the likeliest cause of her illness?

- 1- Carcinoma of the breast
- 2- HIV infection
- 3- Lymphoma
- 4- SLE
- 5- Tuberculosis (TB)

Answer & Comments

Answer: 5- Tuberculosis (TB)

The patient could be HIV co-infected but HIV itself is not a cause of pyrexia of unknown origin (PUO).

The patient should be offered HIV testing.

Other diagnoses are possible but less likely than TB.



[Q: 3562] OnExamination 2012 - Basic Science

A patient with multiple drug resistant (MDR) TB is receiving prolonged treatment with moxifloxacin.

Which side effect is likely to occur as a result of prolonged administration?

- 1- Achilles tendinitis
- 2- Hepatotoxicity
- 3- Nephrotoxicity
- 4- Peripheral neuropathy
- 5- Retinopathy

Answer & Comments

Answer: 1- Achilles tendinitis

This is an idiosyncratic reaction associated with prolonged use of quinolones.



[Q: 3563] OnExamination 2012 - Basic Science

Gentamicin, 7 mg/kg once daily, is administered to an elderly patient with severe urosepsis.

Twenty-four hours post administration gentamicin levels are more than 2 mg/l.

Which of the following complications would you expect?

- 1- Hepatotoxicity
- 2- Nephrotoxicity

- 3- Ototoxicity
- 4- Peripheral neuropathy
- 5- Retinopathy

Answer & Comments

Answer: 2- Nephrotoxicity

Prolonged exposure to gentamicin is likely to cause nephrotoxicity, particularly in elderly patients with renal impairment.

Therefore the next dose of gentamicin should not be given if the gentamicin trough exceeds 2 mg/l.



[Q: 3564] OnExamination 2012 - Basic Science

What is the mechanism of action of ciprofloxacin?

- 1- Cell wall inhibition
- 2- Inhibition of protein synthesis (translation)
- 3- Inhibition of protein synthesis (transcription)
- 4- Inhibition of folic acid metabolism
- 5- Interference with DNA replication

Answer & Comments

Answer: 5- Interference with DNA replication

Ciprofloxacin interferes with DNA synthesis by disrupting the function of DNA gyrase.



[Q: 3565] OnExamination 2012 - Basic Science

What is the mechanism of action of trimethoprim?

- 1- Cell wall inhibition
- 2- Inhibition of protein synthesis (translation)
- 3- Inhibition of protein synthesis (transcription)
- 4- Inhibition of folic acid metabolism

- 5- Interference with DNA replication

Answer & Comments

Answer: 4- Inhibition of folic acid metabolism

Trimethoprim interferes with the action of dihydrofolic reductase (DHFR), which is an enzyme that converts dihydrofolic to tetrahydrofolic acid, an essential stage in bacterial purine and, ultimately DNA synthesis.



[Q: 3566] OnExamination 2012 - Basic Science

What is the mechanism of action of glycopeptides (for example, vancomycin)?

- 1- Cell wall inhibition
- 2- Inhibition of protein synthesis (translation)
- 3- Inhibition of protein synthesis (transcription)
- 4- Inhibition of folic acid metabolism
- 5- Interference with DNA replication

Answer & Comments

Answer: 1- Cell wall inhibition

Glycopeptides inhibit cell wall synthesis through steric hindrance of peptidoglycans, components of the bacterial cell wall.



[Q: 3567] OnExamination 2012 - Basic Science

What is the mechanism of action of gentamicin, when used synergistically with benzylpenicillin to treat an infective endocarditis caused by Streptococcus viridans?

- 1- Cell wall inhibition
- 2- Inhibition of protein synthesis (translation)
- 3- Inhibition of protein synthesis (transcription)
- 4- Inhibition of folic acid metabolism
- 5- Interference with DNA replication

Answer & Comments

Answer: 2- Inhibition of protein synthesis (translation)

Gentamicin is synergistic to the action of benzylpenicillin.

Benzylpenicillin is bactericidal, inhibiting cell wall synthesis, enabling gentamicin to enter the bacterial cell.

It acts at the level of the ribosome, inhibiting protein synthesis.



[Q: 3568] OnExamination 2012 - Basic Science

You would be likely to observe the lowest heritability score in:

- 1- Cleft lip/palate
- 2- Congenital heart disease
- 3- Cystic fibrosis
- 4- Mumps
- 5- Spina bifida

Answer & Comments

Answer: 4- Mumps

Mumps is due to an infective agent and hence has the lowest heritability score.

All the other disorders have a genetic aetiological component, for example, cystic fibrosis is autosomal recessive.



[Q: 3569] OnExamination 2012 - Basic Science

A 17-year-old male who appears tall and thin for his age, presents with a high arch palate, chest wall deformities and livedo reticularis.

Which of the following is also associated with this syndrome?

- 1- Autosomal dominance
- 2- Methionine accumulation
- 3- Osteopetrosis

4- Positive Guthrie test

5- Upward dislocation of the lens

Answer & Comments

Answer: 2- Methionine accumulation

This syndrome is most likely to be homocystinuria.

Marfan's syndrome is associated with upward dislocation of the lens, but not with livedo reticularis, which is seen in homocystinuria due to the venous thrombosis in the small vessels of the skin.

Homocystinuria is associated with downward dislocation of the lens, and is an autosomal recessive disorder.

Osteoporosis, and not osteopetrosis is seen in homocystinuria.

A positive Guthrie test is associated with phenylketonuria.

Reduced activity of cystathionine-synthase results in accumulation of homocysteine and methionine, interfering with collagen cross-linking, which is the cardinal feature of homocystinuria.



[Q: 3570] OnExamination 2012 - Basic Science

Which of the following conditions is most likely to be detectable by growth monitoring?

- 1- Hyperthyroidism
- 2- Hypothyroidism
- 3- Insulin dependent diabetes mellitus
- 4- Pseudohypoparathyroidism
- 5- XYY syndrome

Answer & Comments

Answer: 2- Hypothyroidism

Benefits of growth monitoring include:

Early detection of conditions such as:

Hypothyroidism

Growth hormone insufficiency

Syndromes: Turner, Russell-Silver, Noonan's, skeletal dysplasias

Growth impairment, for example, coeliac disease, inflammatory bowel disease or chronic renal failure

Intracranial tumours

Short normal children

Children with short stature

Health promotion: impaired growth may be associated with child abuse or neglect for example

Focus of interest for parents.

Public health aspects:

Secular trend of increasing growth

Linking growth patterns in fetal life and early infancy with adult patterns of disease

Link between height and social circumstances.



[Q: 3571] OnExamination 2012 - Basic Science

A 69-year-old patient is admitted for routine hernia surgery.

Pre-operatively, his serum sodium concentration is 122 mmol/l. The surgical team have asked for medical advice regarding the cause of his hyponatraemia. You have assessed him and believe he has diuretic-induced hyponatraemia and dehydration.

According to guidelines, which fluid should be used to resuscitate him?

- 1- 0.45% Saline
- 2- 0.9% Saline
- 3- 5% Dextrose
- 4- Gelofusine

5- Hartmann's solution

Answer & Comments

Answer: 5- Hartmann's solution

Fluid resuscitation is an important and often poorly understood skill. The recent multi-disciplinary GIFTASUP guidelines were endorsed by professional organisations representing surgeons, anaesthetists, biochemists and physicians, including nephrologists.

The guidelines state:

'Saline depletion, for example due to excessive diuretic exposure, is best managed with a balanced electrolyte solution such as Hartmann's.'

In other clinical situations:

Losses from diarrhoea/ileostomy/small bowel fistula/ileus/obstruction should be replaced volume for volume with Hartmann's or Ringer's lactate/acetate type solutions.

Excessive losses from gastric aspiration/vomiting should be treated pre-operatively with an appropriate crystalloid solution which includes an appropriate potassium supplement.

Hypochloraemia is an indication for the use of 0.9% saline, with appropriate additions of potassium and care not to produce sodium overload.

Reference:

Guidelines on Intravenous fluid therapy for adult surgical patients, multidisciplinary guideline 2011.



[Q: 3572] OnExamination 2012 - Basic Science

Which physiological mechanism controls water loss (aquaresis) without loss of sodium (natriuresis)?

- 1- Arginine vasopressin

- 2- Atrial natriuretic peptides
- 3- Renal glomerular filtration rate
- 4- Renin-angiotensin-aldosterone system (RAAS)
- 5- Thirst

Answer & Comments

Answer: 1- Arginine vasopressin

Disorders of sodium concentrations are closely linked with water homeostasis.

When sodium is excreted, water usually follows, such as occurs with diuretic therapy and natriuretic peptides. When sodium is retained, water will also be retained by the kidneys. This is seen in prolonged activation of the RAAS in heart failure where there is increased total body water and total body sodium. The only hormone system which can disrupt this is the arginine vasopressin (AVP) system, also known as anti-diuretic hormone.

AVP maintains a close control of water homeostasis by the use of a water channel called aquaporin. AVP, travelling in the blood stream stimulates:

Short term release of pre-formed aquaporin which is incorporated into the collecting duct basement cell membrane and

Transcription and translation to make more aquaporin, on a longer-term basis.

Aquaporin is a very specialised channel protein with a very tight lumen, which allows only water through.

Water from the lumen of the collecting duct enters the aquaporin allowing concentration of the urine and conservation of water which re-enters body cells. Sodium and other ions cannot get through the aquaporin channels.

Disorders of AVP include:

SIADH - syndrome of inappropriate antidiuretic hormone (ADH). ADH levels are

high causing conservation of water without conservation of sodium. This causes hyponatraemia with inappropriately high loss of sodium in the urine.

Diabetes insipidus - inadequate ADH leads to conservation of sodium and loss of water. Patients become hyperosmolar and hypernatraemic with polyuria and polydipsia.



[Q: 3573] OnExamination 2012 - Basic Science

Which gut hormone promotes the synthesis of intrinsic factor?

- 1- Cholecystokinin (CCK)
- 2- Gastric inhibitory peptide (GIP)
- 3- Gastrin
- 4- Secretin
- 5- Vasoactive intestinal peptide (VIP)

Answer & Comments

Answer: 3- Gastrin

Intrinsic factor

Intrinsic factor is a glucoprotein secreted from the parietal cells of the stomach in response to gastrin, food or histamine. Many substances can bind Vitamin B₁₂ in the gut, but only intrinsic factor can aid its transportation across the mucosal wall. When the Vitamin B₁₂ bound to intrinsic factor reaches the terminal ileum, it binds to receptors on the surface of the mucosal cells and is able to cross the membrane and enter the cytoplasm. The intrinsic factor is then replaced by transcobalamin II which transports the B₁₂ out of the cell and into the bloodstream.

Gastrin

- Big, little and mini forms of gastrin are made in the G-cells of the gastric antrum and duodenum called G-34, G-17 and G-14 respectively

- Made from cleavage of a precursor molecule, preprogastrin
- Multiple fragments exist; with variable degrees of biological activity. The smallest is a tetrapeptide (G-4) but it has reduced biological activity compared with larger molecules
- Once secreted, it enters the blood stream and travels to the gastric fundus where it stimulates the secretion of gastric acid

- Stimulus for secretion:

Antral distention

Amino acids partially digested in stomach - especially phenylalanine, glycine and tryptophan (gastric pH 5-7)

Caffeine, alcohol, hypoglycaemia, calcium

Vagal stimulation due to the smell and taste of food.

- Actions:

Production of gastric acid, pepsinogen and intrinsic factor

Promotes release of secretin

Promotes secretion of bile and pancreatic bicarbonate and enzymes

Increases intestinal and gastric motility

Promotes mucosal growth

Stimulates increased blood flow to stomach.

Production of which of the following cytokines is most likely to be involved in the pathogenesis of this patient's condition?

1- IL-2

2- IL-4

3- IL-18

4- Interferon alpha

5- Interferon gamma

Answer & Comments

Answer: 2- IL-4

This patient has an acute hypersensitivity reaction to a wasp sting.

Th2 CD4 positive lymphocytes are involved in the pathogenesis of anaphylaxis, via the production of IL-4/IL-13 that act on B cells to increase IgE production and precipitate the development of acute hypersensitivity.

IL-4 also exacerbates anaphylaxis by acting synergistically with other vasoactive mediators to increase vascular permeability.

Th1 cells lead to increased production of

Interferon gamma

IL-2

Tumour necrosis factor.

An increase in the Th1:Th2 ratio is associated with a reduction in the risk of allergic/hypersensitivity reactions.



[Q: 3574] OnExamination 2012 - Basic Science

A 22-year-old woman is admitted with symptoms of shortness of breath, facial and laryngeal oedema, erythema and hypotension consistent with anaphylaxis.

She had been stung by a wasp and remembers a very severe reaction in which her whole forearm swelled up the last time she was stung by a wasp some three years earlier.



[Q: 3575] OnExamination 2012 - Basic Science

You are designing a study of a novel autoimmune modulator which shows promise in the treatment of rheumatoid arthritis with extra-articular manifestations, such as pleural effusion.

As a possible test to define which population is suitable, you are considering human leucocyte antigen (HLA) subtyping.

Which HLA antigen type is associated with this type of presentation?

- 1- DQ-2
- 2- DR-1
- 3- DR-2
- 4- DR-3
- 5- DR-4

Answer & Comments

Answer: 5- DR-4

HLA DR-4 is associated with

Rheumatoid arthritis with extra-articular features

Drug induced systemic lupus erythematosus (SLE)

IgA nephropathy

Hypertrophic obstructive cardiomyopathy.

The HLA system determines how antigens are presented to T cells and thus determines response to viral infection and manifestations of autoimmune disease.

Emerging evidence suggests there may be differences in the response to T cell modulating therapies, depending on HLA subtype.



[Q: 3576] OnExamination 2012 - Basic Science

Which of the following is true of autosomal dominant breast cancer?

- 1- Autosomal dominant breast cancer affects females but not males
- 2- BRCA 2 mutations increase the risk of prostate cancer
- 3- Females with the BRCA1 mutation will develop breast cancer
- 4- It accounts for nearly half of all breast cancer cases in the United States

- 5- Penetrance is close to 100%, with nearly all gene carriers developing breast cancer by age 80

Answer & Comments

Answer: 2- BRCA 2 mutations increase the risk of prostate cancer

An estimated 5-10% of breast cancers are inherited.

Autosomal dominant inheritance is the main means of inheritance and the BRCA1 and BRCA2 mutations are two such genes.

BRCA1 is also associated with increased risk of pancreatic cancer, and BRCA2 is associated with pancreatic cancer, prostate cancer and melanoma.

It is important to remember that inheritance of these mutations leads to an increased risk of developing a malignancy, not the certainty of developing a malignancy.



[Q: 3577] OnExamination 2012 - Basic Science

Which of the following is typically elevated in Gaucher's disease?

- 1- Acid phosphatase
- 2- Alkaline phosphatase
- 3- Amylase
- 4- Glucocerebrosidase
- 5- Lipase

Answer & Comments

Answer: 1- Acid phosphatase

Gaucher's disease is the most frequent of the lysosomal storage diseases.

The condition is usually due to a catalytic deficiency of glucocerebrosidase. It is accompanied by many ill-understood plasma and metabolic abnormalities. These include a polyclonal immunoglobulin response that may

progress to monoclonal gammopathy, amyloidosis, or even frank myeloma.

Low-density lipoprotein (LDL) and high-density lipoprotein (HDL) cholesterol fractions are abnormal in the plasma.

Some lysosomal enzymes are elevated including tartrate-resistant acid phosphatase, hexosaminidase, and a human chitinase, chitotriosidase. This latter enzyme has proved to be very useful for monitoring Gaucher's disease activity in response to treatment and may reflect the severity of the disease.



[Q: 3578] OnExamination 2012 - Basic Science

Alpha-glucosidase is defective in which of the following disorders?

- 1- Andersen disease (glycogen storage disorder type 4)
- 2- Cori's disease (glycogen storage disorder type 3)
- 3- McArdle's disease (glycogen storage disorder type 5)
- 4- Pompe's disease (glycogen storage disorder type 2)
- 5- Von Gierke's disease (glycogen storage disorder type 1)

Answer & Comments

Answer: 4- Pompe's disease (glycogen storage disorder type 2)

Some of the glycogen storage disorders can have muscle involvement. These include:

Pompe's disease or acid maltase deficiency

Cori's/Forbes' disease or amylo-1-6-glucosidase deficiency

McArdle's disease or myophosphorylase deficiency.

Andersen disease is a deficiency of amylo-1,4-1,6 transglucosidase.

Von Gierke's disease is a deficiency of glucose 6 phosphorylase.



[Q: 3579] OnExamination 2012 - Basic Science

A 78-year-old man who lives alone and prepares his own food is found to have numerous ecchymotic haemorrhagic areas around his hair follicles. The hairs are fragmented and several haematomas are present in the muscles of the arms and legs. Except for the absence of teeth, the rest of the physical examination is unremarkable.

Laboratory examination reveals a normal prothrombin time, APTT and full blood count is normal except for a haematocrit of 28%.

efficiency of which of the following is most likely to explain this patient's presentation?

- 1- Folate
- 2- Vitamin A
- 3- Vitamin C
- 4- Vitamin K
- 5- Zinc

Answer & Comments

Answer: 3- Vitamin C

This man has features of scurvy.

Scurvy is the clinical state arising from dietary deficiency of vitamin C (ascorbic acid). It results in impaired collagen synthesis. The typical pathological manifestations of vitamin C deficiency are noted in dentine, osteoid and capillary vessel wall tissues.

Clinical features include

Gum swelling

Friability

Bleeding, and infection with loose teeth

Mucosal petechiae

Scleral icterus (late, probably secondary to haemolysis)

and pale conjunctiva are seen.

Fractures

Dislocations

Tenderness of bones

are common in children.

Bleeding into muscles and joints may be seen.

Perifollicular hyperkeratotic papules

Perifollicular haemorrhages

Purpura, and

Ecchymoses

are the classical skin manifestations of scurvy.



[Q: 3580] OnExamination 2012 - Basic Science

Which of the following suggests a diagnosis of Hurler's syndrome rather than Hunter's syndrome?

- 1- Cardiomyopathy
- 2- Cloudy cornea
- 3- Mental retardation
- 4- Skeletal abnormalities
- 5- X linked inheritance

Answer & Comments

Answer: 2- Cloudy cornea

Hunter's syndrome (MPS-2) is of X linked inheritance. The corneas are clear. The skeletal involvement tends to be mild with no gibbous present, though scoliosis is often found.

Mental retardation and heart involvement are less severe than in Hurler's syndrome.

Hurler's syndrome (MPS-1) is autosomal recessive in inheritance and is associated with

cloudy cornea. There is severe mental retardation, and gibbous deformation of the spine is characteristic. There is the characteristic coarse facies with hepatosplenomegaly.



[Q: 3581] OnExamination 2012 - Basic Science

Which of the following is true regarding chromosomes?

- 1- A fetus with triploidy will have 47 chromosomes
- 2- Down's syndrome is most commonly due to an extra copy of chromosome 21 inherited from the father
- 3- Heterochromatin is mostly composed of active genes
- 4- Telomeres provide the point of attachment to the mitotic spindle
- 5- The normal human karyotype contains 22 pairs of autosomes

Answer & Comments

Answer: 5- The normal human karyotype contains 22 pairs of autosomes

The human karyotype consists of 22 pairs of autosomes and 1 pair of sex chromosomes.

Down's syndrome is most commonly due to trisomy of C21 with the majority a consequence of non-disjunction within the ovum.

Trisomy results in 47 chromosomes whereas triploidy is the presence of three complete sets of chromosomes instead of two in all cells.

Heterochromatin is of little genetic significance containing mostly inactivated genes.

Telomeres are the distal extremities of the chromosomal arms but the centromeres

provide the point of attachment to the mitotic spindle.



[Q: 3582] OnExamination 2012 - Basic Science

You are looking after a 48-year-old patient with alcohol-related liver disease and varices. She was admitted the previous day with haematemesis and is currently nil-by-mouth awaiting an endoscopy with variceal banding. She weighs 50 kg.

Her blood test results are as follows:

Test result reference range:

Na 122 mmol/l/135-145

K 4.2 mmol/l/3.5-5.2

Creatinine 82 µmol/l/80-120

You wish to assess her requirements for IV fluids, while she is nil-by-mouth.

What is her daily potassium requirement?

- 1- None
- 2- 10 mmol/l
- 3- 25 mmol/l
- 4- 50 mmol/l
- 5- 120 mmol/l.

Answer & Comments

Answer: 4- 50 mmol/l

Patients need around 1 mmol/kg per day to maintain body potassium reserves.

In general, patients who are nil-by-mouth awaiting procedures or surgery require maintenance doses of sodium and potassium. This is particularly important to prevent hypokalaemia as patients recovering from acute illness are often slow to normalise their potassium concentrations.

The multidisciplinary GIFTASUP guidelines regarding IV fluid therapy in adults state:

"In the adult, daily maintenance requirements are usually the reference nutrient intake (RNI) 70 mmol sodium, and 1500-2500 ml water. In the absence of kidney disease or hyperkalaemia potassium needs to be provided in amounts close to the RNI for adults (40-80 mmol/day) - bearing in mind that in the unfed, low insulin state potassium may equilibrate more slowly with the intracellular space than when insulin or nutritionally significant amounts of carbohydrate are being administered."

In the patient above, who has alcohol-related liver disease, there may be additional factors which may affect fluid and sodium prescription, such as oedema.

Reference:

Guidelines on Intravenous fluid therapy for adult surgical patients, multidisciplinary guideline 2011.



[Q: 3583] OnExamination 2012 - Basic Science

What serious complication can occur when hyponatraemia is corrected too rapidly?

- 1- Cerebral demyelination
- 2- Cerebellar dysarthria
- 3- Gait disturbance
- 4- Peripheral neuropathy
- 5- Postural hypotension

Answer & Comments

Answer: 1- Cerebral demyelination

Hyponatraemia, even in mild degrees, is associated with reduced survival and neurological sequelae.

Even at serum sodium concentrations of 130-135 mmol/l, patients may be at increased risk of falls, and at increased risk of fracturing. However, it is not clear if the adverse prognosis of hyponatraemia is due to low serum sodium as such, or if this just

represents a patient group with more comorbidities or polypharmacy.

Hyponatraemia causes

Fatigue

Muscle weakness

Gait disturbance

Falls

Disorientation

Cerebral oedema

Seizures

and death if untreated.

If hyponatraemia develops gradually (>48 hours) the body can use compensatory mechanisms. The risk of cerebral oedema is greater in patients with acute onset (<48 hours) who are unable to use these compensatory mechanisms.

The treatment of hyponatraemia however can also cause problems if it occurs too rapidly. The consequences include cerebral demyelination at pontine and extra-pontine sites. Many authorities recommend that increases in serum sodium of <12 mmol/24 hours are likely to be safe for the majority of patients.

Certain patients with hypokalaemia, liver disease, poor nutritional state or burns are at higher risk of demyelination and should have a rate of sodium correction of <8 mmol/24 hours.



[Q: 3584] OnExamination 2012 - Basic Science

Which of the following situations can cause a reduction in total body magnesium content?

- 1- Acute pancreatitis
- 2- Long term treatment with omeprazole
- 3- Myocardial infarction

4- Recovery from diabetic ketoacidosis

5- Refeeding syndrome

Answer & Comments

Answer: 2- Long term treatment with omeprazole

All of the conditions listed can be associated with hypomagnesaemia but many are due to a shift of magnesium from the blood into body cells, which are not necessarily associated with a change in total body magnesium levels. Hypomagnesaemia due to a shift between blood and cellular compartments may still require treatment and can cause symptoms if severe.

Omeprazole causes hypomagnesaemia which, if severe, can cause hypoparathyroidism and hypocalcaemia. The reasons for this are unclear, but it may be due to reduced uptake of Mg^{2+} ions in the gut. Omeprazole reduces acid production and raises stomach pH. An acid environment can aid release of metal ions from their binding sites in food molecules which facilitate absorption.

Causes of hypomagnesaemia include:

- Inadequate intake
- Malnutrition
- Alcohol dependence
- Malabsorption
- Inflammatory bowel disease
- Long term PPI therapy
- Gluten enteropathy
- Intestinal bypass
- Radiation enteritis
- Renal tubular disease
- Hyperaldosteronism
- Hyperparathyroidism

Obstructive uropathy

Potassium depletion

Drugs including diuretics, amphotericin, cisplatin, ciclosporin, amikacin, gentamicin, laxatives and tacrolimus

Intracellular shift

Post myocardial infarction

Post parathyroidectomy

Recovery from diabetic ketoacidosis (K⁺ and PO₄⁻ also enter cells)

Refeeding syndrome (PO₄⁻ also enters cells)

Acute pancreatitis.

Investigating the cause of hypomagnesaemia:

Blood magnesium levels can guide but do not accurately reflect total body magnesium status. Attempts to find a marker of cellular magnesium status include measuring erythrocyte or monocyte Mg but these are not generally available.

Urine Mg excretion is a useful guide. When there is inadequate intake or malabsorption, the kidneys would normally conserve Mg, giving urine Mg concentrations <7mmol/24 hours. The reference range is around 2-7 mmol/24 hours.



[Q: 3585] OnExamination 2012 - Basic Science

Which gut hormone is made in the I cells of the duodenum and jejunum?

- 1- Cholecystokinin (CCK)
- 2- Gastric inhibitory peptide (GIP)
- 3- Gastrin
- 4- Secretin
- 5- Vasoactive intestinal peptide (VIP)

Answer & Comments

Answer: 1- Cholecystokinin (CCK)

CCK is made in the I cells of the duodenum and jejunum. The structure, stimulus for secretion and actions of CCK are summarised below.

Gastrin - G cells of the gastric antrum and duodenum.

Secretin - S cells of the granular mucosa of the duodenum.

VIP is predominantly found in the nervous system and gut and is considered a neurotransmitter.

Cholecystokinin (CCK)

Made in I cells of duodenum, jejunum and enteric nerves

Structurally similar to gastrin

Actions:

Promotes gallbladder contraction and intestinal motility

Increases secretion of pancreatic enzymes including insulin, glucagons, pancreatic polypeptides

Role in satiety

Short half life, less than three minutes, cleared by the kidneys

Stimulus for secretion:

Mixtures of polypeptides and amino acids especially phenylalanine and tryptophan stimulate release but undigested protein does not

Gastric acid entering duodenum

Fatty acids, especially in micelles

Secretion inhibited by somatostatin.

Reference:

Tietz Textbook of Clinical Chemistry, 5th edition.



[Q: 3586] OnExamination 2012 - Basic Science

What is the most characteristic symptom of hypocalcaemia?

- 1- Abdominal pain due to peptic ulceration
- 2- Polyuria and polydipsia
- 3- Renal calculi
- 4- Tetany
- 5- Weakness due to hypokalaemia

Answer & Comments

Answer: 4- Tetany

Hypocalcaemia characteristically causes

Increased neuromuscular excitability, manifesting as tetany

Carpopedal spasm (Trousseau's sign)

Seizures

Hyperreflexia

Paraesthesia and

Hypotension.

Weakness can also occur but is not generally associated with hypokalaemia.

Chronic hypocalcaemia, even when mild, predisposes to cataract formation.

The other symptoms above are more typically associated with hypercalcaemia:

Peptic ulceration. Calcium stimulates gastrin release and promotes increased secretion of gastric acid.

Polyuria and polydipsia are typical, due to a type of nephrogenic diabetes insipidus - modification of the renal response to antidiuretic hormone causing dehydration.

Renal calculi occur with chronic hypercalcaemia.

Hypokalaemia can be due to hypercalcaemia as calcium inhibits reabsorption of potassium, promoting its loss in the urine.



[Q: 3587] OnExamination 2012 - Basic Science

Parents of a 6-year-old boy present concerned that their son may be carrying the gene for Huntington's disease.

The father was diagnosed with the disease at age 32. The mother has been genetically screened and is not a carrier of the gene.

What is the likelihood of their son suffering with Huntington's disease?

- 1- 0 risk
- 2- 1 in 2
- 3- 1 in 4
- 4- 1 in 8
- 5- 3 in 4

Answer & Comments

Answer: 2- 1 in 2

Huntington's disease (HD), a progressive, degenerative neurological disease, has an autosomal dominant mode of transmission.

This means that only one copy of the faulty gene is required in the genotype for the patient to be a sufferer.

With the above case, the father is heterozygous which means he himself only has one copy of the gene (two copies of the gene are very unlikely with extremely severe phenotypes probably incompatible with life) and the mother seems to have no copies of the gene.

In this case with an autosomal dominant disease, the likelihood of a child developing the disease is 1 in 2 as it is expected that 50% of the offspring of this couple will have a faulty gene.

Symptoms of this disease tend to start to develop in early middle age and include an unsteady gait and jerky involuntary movements, accompanied later by behavioural changes and progressive dementia.

The defective gene is located on chromosome 4.

Genetic screening is now available.



[Q: 3588] OnExamination 2012 - Basic Science

It has been suggested that cystic fibrosis (CF) (autosomal recessive) has a high prevalence in some populations because heterozygotes are resistant to the effects of chloride-secreting diarrhoea. *This is best described as an example of:*

- 1- Gene flow
- 2- Genetic drift
- 3- Linkage disequilibrium
- 4- Mutation
- 5- Natural selection

Answer & Comments

Answer: 5- Natural selection

Natural selection is the likely explanation as it appears that heterozygous for CF may offer some protection against diarrhoeal illnesses particularly cholera. Natural selection is defined as the process whereby organisms possessing certain characteristics that make them better adjusted to the environment tend to survive and reproduce in greater numbers, and are therefore able to transmit their qualities to succeeding generations.

Gene flow (also known as genetic migration) is the transfer of alleles or genes from one population to another. In humans it usually happens following migration (e.g. West African population with European in USA).

Genetic drift refers to the statistical drift over time of gene frequencies in a population, due to random sampling effects in subsequent generations.

Linkage disequilibrium is the occurrence of some combinations of alleles more or less often than would be expected from a random formation of haplotypes.

Mutation is a change in genetic sequence.



[Q: 3589] OnExamination 2012 - Basic Science

What test is used to confirm the diagnosis of Gaucher disease?

- 1- Abdominal ultrasound
- 2- Alkaline phosphatase
- 3- Bone marrow biopsy with Gaucher's cells identified
- 4- Clinical examination
- 5- Enzyme studies of blood leucocytes

Answer & Comments

Answer: 5- Enzyme studies of blood leucocytes

Gaucher disease is a genetic disorder characterised by complete or incomplete deficiency of the enzyme glucocerebrosidase, required for the metabolism of sphingolipid. Sphingolipids are normally found throughout the body but are particularly important in the grey matter of the brain and in myelin sheaths.

Gaucher's disease results in accumulation of glycosphingolipids in liver, spleen and bone marrow. The defective gene is located on chromosome 21 and around 200 mutations have been described. There is therefore a high degree of phenotypic variation.

Certain mutations result in complete deficiency of the enzyme, and present in infancy with severe clinical effects (typically types 2 and 3). Partial deficiency of the

enzyme results in a later presentation and more moderate clinical effects. Type 1 patients typically have 10-15% of enzyme activity and present in adulthood.

Type 1 disease: often presents in adulthood with organomegaly, haematological abnormalities such as anaemia, bleeding risk, abdominal pain and skeletal abnormalities.

Type 2 disease: frequently progressively fatal in infancy. Prominent neurological features are present including ophthalmoplegia, spasticity and CNS degeneration.

Type 3 disease: milder course with CNS involvement.

Diagnosis is through enzyme studies on whole blood leucocytes. Clinical examination and abdominal ultrasound may suggest the diagnosis but cannot provide biochemical confirmation. Bone marrow biopsy is not required in all patients but shows characteristic glycosphingolipid-containing macrophages called Gaucher's cells.

Acid phosphatase, chitotriosidase, macrophage inflammatory protein (MIP)-1?, MIP-1? and soluble CD163 can be used for surveillance of the disease.

Further reading (available through pubmed):

Harmanci O, Bayraktar Y. Gaucher disease: new developments in treatment and etiology. World J Gastroenterol 2008; 14(25): 3968-3973.



[Q: 3590] OnExamination 2012 - Basic Science

Which one of the following statements regarding X-linked recessive diseases is correct?

- 1- Are not usually associated with immune deficiency
- 2- Are usually associated with male infertility
- 3- Can occur with equal severity in males and females

4- Do not show anticipation

5- Include G6PD deficiency, ornithine transcarbamylase deficiency, hypophosphataemic rickets and von Willebrand's disease

Answer & Comments

Answer: 3- Can occur with equal severity in males and females

X linked recessive diseases can occur with the same severity in females in certain situations having

An affected father and carrier mother (seen in G6PD deficiency)

Turner's syndrome

X chromosome isodisomy

Unequal lyonisation,

also in

An XY individual with testicular feminisation syndrome

and where there is

An X/autosome translocation through a gene (DMD).

Fragile X syndrome shows anticipation with triplet repeat expansion.

Y linked diseases can be associated with male infertility.

There are several X linked immune deficiency syndromes and severe combined immune deficiency, chronic granulomatous disease, agammaglobulinaemia (Bruton's disease), and Wiscott-Aldrich syndrome.

Hypophosphataemic rickets is X linked dominant, and von Willebrand's disease is inherited in an autosomal dominant manner.



[Q: 3591] OnExamination 2012 - Basic Science

Which of the following is a characteristic feature of acute intermittent porphyria?

- 1- Autosomal recessive inheritance
- 2- Excessive faecal protoporphyrin excretion
- 3- Excessive urinary porphobilinogen during an acute attack
- 4- Hyponatraemia during attacks
- 5- Photosensitivity

Answer & Comments

Answer: 3- Excessive urinary porphobilinogen during an acute attack

Acute intermittent porphyria (AIP) causes the classic acute attacks of porphyria, with abdominal pain and neuropsychiatric symptoms. It is caused by reduced hepatic porphobilinogen deaminase activity, which is inherited in an autosomal dominant fashion. This leads to increased urinary porphobilinogen and aminolaevulinic acid, especially during attacks. The urine classically turns deep red on standing. Hyponatraemia is often present during acute attacks and may, in part, be due to inappropriate secretion of antidiuretic hormone.

Episodes of porphyria are more common in females, possibly due to the effects of oestrogens, and the onset is usually in adolescence. Attacks are characterised by motor polyneuropathy, hypertension, tachycardia, and abdominal pain associated with vomiting and constipation. Tubulointerstitial nephritis may be present. There is no photosensitivity or rash.

Attacks may be precipitated by drugs (including alcohol, benzodiazepines, rifampicin, oral contraceptives, phenytoin and sulphonamides), stress, pregnancy, premenstruation, infection and fasting.

Treatment is usually supportive, with high carbohydrate supplementation and withdrawal of precipitating factors. Daily haem arginate infusions can be given for 3-4 days.

Faecal protoporphyrin is raised in protoporphyria and variegate protoporphyria, but normal in AIP.



[Q: 3592] OnExamination 2012 - Basic Science

Which of the following would be most in keeping with a diagnosis of polymyalgia rheumatica (PMR)?

- 1- Erythema nodosum
- 2- Increased alkaline phosphatase
- 3- Raised creatine kinase (CK)
- 4- Shoulder and pelvic girdle pain in a 40-year-old man
- 5- Sudden loss of vision in one eye

Answer & Comments

Answer: 2- Increased alkaline phosphatase

Liver enzymes are elevated in most patients.

Visual disturbances are suggestive of temporal arteritis not PMR, and are due to ischaemic changes in ciliary arteries (optic neuritis/infarction) and less commonly due to central artery occlusion.

Raised CK occurs in polymyositis.

PMR is rare before the age of 50 years.



[Q: 3593] OnExamination 2012 - Basic Science

Which factor inhibits the release of growth hormone (GH) from the pituitary?

- 1- Fasting
- 2- Ghrelin
- 3- Hypoglycaemia

4- Somatostatin

5- Stress

Answer & Comments

Answer: 4- Somatostatin

Roles of somatostatin:

Inhibits GH release

Inhibits secretion of insulin and glucagons.

GH release is increased by:

Deep sleep

Fasting

Alpha adrenergic activity

Stress

Exercise

Sex steroids

Hypoglycaemia

Amino acids

Thyroxine

Ghrelin.

GH release is inhibited by:

Somatostatin

Cortisol

Beta adrenergic activity

Hyperglycaemia

Obesity

Free fatty acids

Hypothyroidism

IGF-1.



[Q: 3594] OnExamination 2012 - Basic Science

Hypermagnesaemia can occur during which of the following clinical situations?

1- Chronic administration of omeprazole

2- Chronic kidney disease

3- Refeeding syndrome

4- Untreated pre-eclampsia

5- Untreated renal calculi

Answer & Comments

Answer: 2- Chronic kidney disease

Hypermagnesaemia is much less common than hypomagnesaemia and is often iatrogenic in cause.

Causes of hypermagnesaemia:

Iatrogenic

Treatment with magnesium sulphate to prevent/treat seizures in patients with eclampsia or pre-eclampsia

Treatment with Mg containing antacids

Use of citrate-glucuronic acid solutions to dissolve renal calculi either through bladder irrigation or via a nephrostomy tube

Over-zealous IV treatment of hypomagnesaemia

Chronic use of Mg-containing enemas.

Other causes

Acute or chronic renal failure - release of Mg from tissues, Mg in dialysate, Mg in phosphate binding drugs

Familial hypocalciuric hypercalcaemia.

Interpretation of serum Mg results:

0.7-1.5 mmol/l: reference range

1.5-2.5 mmol/l: mild hypermagnesaemia - symptoms uncommon

2.5-5.0 mmol/l: moderate hypermagnesaemia - symptoms develop including hypotension, prolonged PR and QRS intervals on ECG, areflexia

>5.0 mmol/l: severe hypermagnesaemia - at risk of respiratory paralysis through inhibition of acetylcholine release and cardiac arrest.

Treatment:

Hypermagnesaemia does not always require treatment - if mild/moderate and iatrogenic, often it is enough to identify and stop the cause. In an emergency, dialysis or administration of IV calcium glucuronate (10 ml of 10%) will reduce the effects of hypermagnesaemia.



[Q: 3595] OnExamination 2012 - Basic Science

What is the mechanism of action of cyanide?

- 1- Inhibition of enzyme acetylcholinesterase
- 2- Inhibition of enzyme cytochrome oxidase c
- 3- Inhibition of enzyme pyruvate dehydrogenase
- 4- Prevention of mitochondrial replication
- 5- Promoting mutations in DNA

Answer & Comments

Answer: 2- Inhibition of enzyme cytochrome oxidase c

Cyanide causes the inhibition of the enzyme cytochrome oxidase c which is an essential part of the mitochondrial electron transfer chain (ETC). It therefore interferes with the basic process of cellular respiration, preventing the formation of ATP and causing rapid cell death.

Sarin gas and related agents cause inhibition of the enzyme acetylcholinesterase, causing levels of acetylcholine to build up in the nervous system causing prolonged sustained contraction of the diaphragm. This hinders and eventually paralyses normal breathing.

Arsenic causes inhibition of the enzyme pyruvate dehydrogenase which is necessary for the conversion of pyruvate to acetyl CoA.

This also interferes with the basic process of cellular respiration, as pyruvate formed during glycolysis cannot be changed to acetyl CoA to enter the Krebs's cycle.

Unfortunately, many agents also cause mutational damage to DNA, so if victims are fortunate enough to survive the initial insult, they may still have significant long term health repercussions. Arsenic and mustards are known for this, and carry risks of skin and haematological malignancy in the longer term. Arsenic can also accelerate atherosclerosis.



[Q: 3596] OnExamination 2012 - Basic Science

Chronic alcohol abuse is typically associated with which abnormal laboratory results?

- 1- Hypermagnesaemia
- 2- Increased carbohydrate deficient transferrin
- 3- Microcytosis
- 4- Reduced AST:ALT ratio
- 5- Reduced iron and ferritin concentrations

Answer & Comments

Answer: 2- Increased carbohydrate deficient transferrin

Unfortunately, most of the tests available are not specific to alcohol excess. However, a combination of several consistent abnormalities occurring together gives a better indication of the cause being alcohol-related.

Carbohydrate deficient transferrin (CDT) is usually elevated and gradually falls after weeks and months of abstinence. It is very useful in some situations, where verifying abstinence is of particular importance. However, it is an expensive, time-consuming and specialised test which limits its usefulness in routine clinical practice.

The following abnormalities are common in chronic alcohol dependence:

Macrocytosis

Elevated GGT - this is due to enzyme induction but does not necessarily indicate that there is liver damage

Hypertriglyceridaemia - can contribute to pancreatitis

Hyperuricaemia - can cause gout

Hypoglycaemia - can contribute to seizures and coma

Hypomagnesaemia

Hypogonadism

Thiamine deficiency

Increased carbohydrate deficient transferrin - considered a marker of chronic abuse and sometimes checked to ensure abstinence, for example, while awaiting liver transplantation

Iron levels are variable in alcohol dependence: hepatitis causes increased serum iron while poor diet can result in iron deficiency

Ferritin can be elevated in the acute phase response, but reduced in advanced liver disease due to possible reduced synthesis rates

Hyponatraemia and hypokalaemia are often seen in established liver disease

ALT is elevated in liver disease and hepatocellular damage

AST is elevated (but can also be increased in cardiac or muscular damage).

AST:ALT ratio can be elevated due to the mitochondrial effects of alcohol causing a disproportionate increase in AST. However, this is not specific.



[Q: 3597] OnExamination 2012 - Basic Science

A previously well 35-year-old patient presents with anxiety and weight loss. Serum corrected calcium is 2.95 mmol/l.

What is the most likely cause of his hypercalcaemia?

- 1- Addison's disease
- 2- Secondary hyperparathyroidism
- 3- Thyrotoxicosis
- 4- Vitamin D toxicity
- 5- Williams' syndrome

Answer & Comments

Answer: 3- Thyrotoxicosis

Hypercalcaemia is common and can be caused by:

Primary hyperparathyroidism - overproduction of parathyroid hormone (PTH) due to hyperplasia or an adenoma of the PTH glands.

Tertiary hyperparathyroidism - in a patient with chronic renal failure with prolonged hypocalcaemia the parathyroids become autonomous, even if renal function is improved with transplantation. This can lead to hypercalcaemia.

Malignancy - commonly myeloma, prostate, breast, lung, thyroid and kidney cancers.

Drugs: lithium, vitamin D overdose, vitamin A toxicity, thiazides, milk-alkali syndrome, familial hypercalcaemic hypocalciuria.

Thyrotoxicosis - most patients with thyrotoxicosis have minor alterations in serum calcium, but a minority have significant symptomatic hypercalcaemia, probably due to increased bone turnover. Treating the thyroid disease causes resolution of the hypercalcaemia.

Addison's disease - although it would be uncommon to have significant hypercalcaemia.

Granulomatous disease - sarcoidosis, leprosy, TB.

Infections: HIV, histoplasmosis.

Williams' syndrome - a rare genetic disease affecting chromosome 7 and characterised by hypercalcaemia in infancy, anxiety and learning disability.

Note that secondary hyperparathyroidism is a response to hypocalcaemia, not a cause of hypercalcaemia.



[Q: 3598] OnExamination 2012 - Basic Science

Which apolipoprotein is characteristically found in low density lipoproteins (LDL)?

- 1- Apo A-I
- 2- Apo B-100
- 3- Apo B-48
- 4- Apo C III
- 5- Apo E

Answer & Comments

Answer: 2- Apo B-100

The main apolipoprotein in LDL is ApoB-100, which contains several very hydrophobic areas responsible for binding large quantities of lipid. It also contains a domain allowing binding to the LDL receptor.

Apo A-I is the major apolipoprotein in high density lipoprotein (HDL), comprising around 70% of its protein. The remainder is largely Apo A-II. Apo A-I is thought to be responsible for reverse cholesterol transport.

Apo B-48 is the major apolipoprotein in chylomicrons and is a fragment of ApoB-100 and comes from the same gene. Apo B-48 is

only produced by the intestine and cannot bind to the LDL receptor.

Apo C-III is present in large amounts in very low-density lipoprotein (VLDL) and in lesser quantities in chylomicrons and HDL. It works to inhibit the enzyme lipoprotein lipase (LPL) and to reduce hepatic uptake of chylomicron and VLDL fragments.

Apo E is found in all lipoproteins except LDL. It is made in the liver and is subject to genetic polymorphisms which can affect chylomicron handling and accumulation in the population. It is important in the removal of chylomicron and VLDL remnants from the blood.

Reference:

Clinical Biochemistry: Metabolic and clinical aspects, Marshall & Bangert, 2nd edition, 2008.



[Q: 3599] OnExamination 2012 - Basic Science

What is the treatment for life-threatening hypokalaemia?

- 1- 10 ml 10% calcium gluconate with IV 0.9% NaCl with 40 mmol/l KCl infused over four hours
- 2- 10 ml 10% calcium gluconate with oral Sando-K tablets
- 3- 1L IV 0.9% NaCl with 40 mmol/l KCl infused over four hours
- 4- Dialysis
- 5- Insulin and 50% dextrose infusion

Answer & Comments

Answer: 3- 1L IV 0.9% NaCl with 40 mmol/l KCl infused over four hours

Hypokalaemia should be treated by administering potassium, either orally (if $K > 2.5$ with no symptoms or ECG changes) or intravenously (if $K < 2.5$ with symptoms or ECG changes).

IV treatment is required in life-threatening cases. Potassium should be given in NaCl.

Concentration should not exceed 40 mmol/l and no more than 10-20 mmol/hour should be given. Careful monitoring of potassium, sodium and creatinine concentrations with water balance is required.

Life-threatening hypokalaemia should ideally be managed with cardiac monitoring.

Check magnesium: hypomagnesaemia can cause refractory hypokalaemia.

The following are treatments for hyperkalaemia:

10 ml 10% calcium gluconate (or calcium chloride)

Insulin and dextrose infusion

Dialysis.



[Q: 3600] OnExamination 2012 - Basic Science

What is the main role of the gut hormone secretin?

- 1- Promotes gastric acid formation
- 2- Promotes secretion of bicarbonate by the pancreas
- 3- Reduces bile flow
- 4- Stimulates lipolysis and glycolysis
- 5- Vasodilatation and relaxation of smooth muscle in gut

Answer & Comments

Answer: 2- Promotes secretion of bicarbonate by the pancreas

Secretin promotes bicarbonate secretion, reduces gastric acid formation and increases bile flow.

Another gut hormone, VIP, stimulates lipolysis, glycolysis and relaxation of the smooth muscle of the gut.

The structure, stimulus for secretion and actions of these hormones are outlined below.

Secretin

Secreted by the S cells of the granular mucosa which are predominantly located in the duodenum.

Unlike gastrin, which is highly fragmented, there are no active fragmentary molecules of secretin - the whole molecule is required for biological activity.

Stimulation for secretion:

Acid in the duodenum (pH<4.5)

Secretion is inhibited by somatostatin

Very low concentrations of secretin are found in the blood - too low to measure accurately. The action of secretin is potentiated by CCK. The half life of secretin is 4 min.

Actions:

Stimulates bicarbonate secretion from pancreas

Stimulates bicarbonate and water secretion by the liver

Increases bile flow and gallbladder contractility

Reduces gastric and duodenal motility

Inhibits normal gastrin secretion and thus reduces gastric acid formation.

Vasoactive intestinal polypeptide (VIP)

Polypeptide hormone with structural similarities to GIP, secretin and glucagon.

VIP is predominantly found in the nervous system and gut and is considered a neurotransmitter.

It has a plasma half life of 1 min and is largely inactivated after a single pass through the liver.

Stimulation for secretion

Vagal stimulation

Relationship to gut stimuli and eating is unclear.

Actions

Vasodilatation and relaxation of smooth muscle in circulatory and GI systems

Promotes water and electrolytes secretion from the gut

Promotes secretion of pancreatic hormones

Stimulates lipolysis, glycolysis and inhibits gastric acid secretion.

Reference:

Tietz Textbook of Clinical Chemistry, 5th edition.



[Q: 3601] OnExamination 2012 - Basic Science

Which tumour marker has the highest specificity when used appropriately?

- 1- AFP
- 2- Bence Jones protein
- 3- CA 125
- 4- CA 19-9
- 5- LDH

Answer & Comments

Answer: 2- Bence Jones protein

Tumour markers ideally need to be both sensitive and specific.

Sensitivity - the ability of a test positively to identify people who have the disease, that is, not missing cases and avoiding false negatives.

Specificity - the ability of a test to give a normal result to people who do not have the disease, that is, appropriately reassuring unaffected patients and avoiding false positives.

In practice, no tumour marker is perfect and false positives and negatives can always occur. However, some perform better than others.

Bence Jones protein is specific for myeloma, false positives are rare, and therefore it is more specific than the other markers.

AFP is elevated in hepatocellular carcinoma and in teratomas but false positive results occur with non-malignant liver disease.

CA125 is used to identify patients with ovarian cancer but false positives occur due to ascites, other abdominal malignancies, endometriosis and pelvic inflammatory diseases.

CA 19-9 is elevated in patients with pancreatic and colorectal carcinomas but is also elevated in obstructive jaundice, cholangitis and cholestasis.

Lactate dehydrogenase (LDH) is a very non-specific marker but can be elevated in some haematological malignancies.



[Q: 3602] OnExamination 2012 - Basic Science

The CAPRIE study looked at whether aspirin or clopidogrel was most appropriate in patients at increased risk of cardiovascular disease to prevent the MACE composite endpoint, which consists of stroke, MI or cardiovascular death, re-hospitalisation or bleeding.

A substudy looked at 3,866 patients with a history of diabetes and found an event rate of 17.7% for patients taking aspirin, versus 15.6% for patients taking clopidogrel.

What is the number needed to treat (NNT) to prevent one event for patients taking clopidogrel versus aspirin?

- 1- 2.1
- 2- 15.6/17.7
- 3- 100/2.1
- 4- 100/15.6
- 5- 100/17.7

Answer & Comments

Answer: 3- 100/2.1

The number needed to treat to prevent one specified outcome event is 100 divided by the absolute risk reduction, in this case $17.7 - 15.6\% = 2.1\%$. This equals 48, meaning that 48 patients need to be treated with clopidogrel versus aspirin to prevent one stroke, MI cardiovascular death, bleed or hospitalisation.

For many studies now, papers quote the number needed to harm. This uses the same principle to establish the difference in absolute risk of an adverse event occurring between two treatment strategies, calculating a number needed to harm by dividing 100 by the absolute risk.

Calculation of both number needed to treat and number needed to harm for a new therapy allows clinicians to establish net clinical benefit.



[Q: 3603] OnExamination 2012 - Basic Science

A 24-year-old man presents to the clinic with his wife. They are keen to start a family, but are concerned because his brother suffers from hereditary haemorrhagic telangiectasia (HHT) and has suffered a number of upper GI haemorrhages over the past few years. Indeed, his father died of a large GI haemorrhage.

He has suffered no bleeding episodes over the past few years and has no skin vascular abnormalities. On examination his blood pressure is normal at 125/72 mmHg, and there are no skin abnormalities. Physical examination is entirely normal.

What is the approximate percentage chance of a male child of this couple inheriting HHT?

- 1- 0%
- 2- 25%
- 3- 50%
- 4- 66%
- 5- 100%

Answer & Comments

Answer: 1- 0%

HHT carries an autosomal dominant inheritance pattern.

Around 90% of patients with the disease are diagnosed by age 16, often because of a problem with nose bleeds. As such this man is extremely unlikely to have the condition, and as his wife is unaffected, the chances of a child, male or female suffering from the disorder is 0%.



[Q: 3604] OnExamination 2012 - Basic Science

A 26-year-old man presented with exertional thigh cramps. He described his urine turning to burgundy colour especially after prolonged exertion.

Investigations in the recent past had excluded presence of any significant ischaemic or inflammatory condition affecting his lower limbs.

On examination, pulse was 74 beats per minute, blood pressure was 122/66 mmHg, heart sounds were normal and there was no abnormal enlargement of any organ found on abdominal examination.

Investigations showed:

Serum urea 4.6 mmol/L (2.5-7.5)

Serum creatinine 88 µmol/L (60-110)

Serum corrected Calcium 2.32 mmol/L (2.2-2.6)

Serum Phosphate 0.92 mmol/L (0.8-1.4)

Serum creatine kinase 76 U/L (24-195)

Urine tested positive for myoglobin

What is the next most appropriate investigation?

- 1- Bone marrow examination for gaucher's cells
- 2- Kidney biopsy

- 3- Liver biopsy
- 4- Muscle biopsy
- 5- Urine for porphyrins

Answer & Comments

Answer: 4- Muscle biopsy

The exertional thigh cramps, the presence of myoglobin and change in colour of urine after exercise suggests glycogen storage disease, type V McArdle's syndrome.

The most appropriate investigation for this is muscle biopsy which reveals subsarcolemmal deposits of glycogen appearing at the periphery of fibres.



[Q: 3605] OnExamination 2012 - Basic Science

A 24-year-old man presented with exertional thigh cramps. He described his urine turning to burgundy colour especially after prolonged exertion.

Investigations in the recent past had excluded the presence of any significant ischaemic or inflammatory condition affecting his lower limbs.

On examination, his pulse was 74 beats per minute, blood pressure was 122/66 mmHg, heart sounds were normal and there was no abnormal enlargement of any organ found on abdominal examination.

Investigations revealed:

Serum urea 4.4 mmol/L (2.5-7.5)

Serum creatinine 88 mol/L (60-110)

Serum corrected Calcium 2.32 mmol/L (2.2-2.6)

Serum Phosphate 1.3 mmol/L (0.8-1.4)

Serum creatine kinase 88 U/L (24-195)

Urine testpositive for myoglobulin

What is the most likely diagnosis?

- 1- Acute intermittent porphyria

- 2- Alkaptonuria
- 3- Gaucher's disease
- 4- Glycogen storage disease
- 5- Multiple myeloma

Answer & Comments

Answer: 4- Glycogen storage disease

The exertional thigh cramps, the presence of myoglobin and change in colour of urine after exercise suggests glycogen storage disease type V - McArdle's syndrome.



[Q: 3606] OnExamination 2012 -
Dermatology

A 23-year-old obese female with known tuberculosis presents with ulcerating nodules on the back of her legs.

Which of the following is the most likely diagnosis?

- 1- Erythema induratum (EI)
- 2- Erythema marginatum
- 3- Erythema nodosum
- 4- Lupus pernio
- 5- Lupus vulgaris

Answer & Comments

Answer: 1- Erythema induratum (EI)

EI is a form of panniculitis characterised by chronic, recurrent, tender, subcutaneous, and sometimes ulcerated nodules on the lower legs that may also appear elsewhere.

Females are more frequently affected, with a female:male ratio of 7:1 and it is more frequent in younger females.

It is found in association with tuberculosis.

Erythema nodosum also a panniculitis is also commonly associated with tuberculosis and presents with painful erythematous nodules in recurrent crops over the legs and arms. The lesions however do not ulcerate.

Another possibility although not provided in the stems is pyoderma gangrenosum.

On the other hand, lupus vulgaris is a chronic, progressive and destructive form of cutaneous tuberculosis in patients with a moderate or high degree of immunity. It occurs more commonly in females than in males.

The classical lesions consist of reddish-brown plaques not nodules. The lesions progress by peripheral extension and central healing, atrophy and scarring. The areas of predilection

are head and neck (80%), followed by arms, legs, then trunk.

This rash is not the typical description of erythema marginatum (finer rash) or multiforme (blisters, targets).

Lupus pernio occurs in association with sarcoid.



[Q: 3607] OnExamination 2012 -
Dermatology

This 35-year-old woman developed this rash associated with facial swelling three weeks after she was started on oral carbamazepine for new-onset epilepsy.

She was also found to be febrile and had raised liver enzymes.

What treatment will she require?

- 1- High-dose oral corticosteroids
- 2- Intravenous immunoglobulins
- 3- Oral antibiotics
- 4- Oral anti-fungals
- 5- Topical corticosteroids

Answer & Comments

Answer: 1- High-dose oral corticosteroids

This patient has drug reaction with eosinophilia and systemic symptoms or DRESS syndrome.

It is a severe idiosyncratic drug reaction, characterised by a generalised erythematous rash often associated with facial oedema, involvement of internal organs (liver dysfunction), haematologic abnormalities (eosinophilia) and systemic illness (fever). It is treated with high dose oral corticosteroids for several months.

Option B: Intravenous immunoglobulins (IVIG) are not indicated in the treatment of DRESS syndrome. Some centres use IVIG for treatment of toxic epidermal necrolysis.

Option C: Oral antibiotics are not used to treat DRESS syndrome.

Option D: Oral anti-fungals are not indicated in the treatment of DRESS syndrome.

Option E: Topical corticosteroids are not useful in the treatment of DRESS syndrome.



[Q: 3608] OnExamination 2012 - Dermatology

This 35-year-old woman developed this rash associated with facial swelling three weeks after she was started on oral carbamazepine for new-onset epilepsy. She was also found to be febrile and had raised liver enzymes.

What is her diagnosis?

- 1- Angioedema
- 2- Drug reaction with eosinophilia and systemic symptoms (DRESS)
- 3- Fixed drug eruption
- 4- Toxic epidermal necrolysis
- 5- Viral exanthem

Answer & Comments

Answer: 2- Drug reaction with eosinophilia and systemic symptoms (DRESS)

This patient has DRESS syndrome, also known as drug hypersensitivity syndrome. It is a severe idiosyncratic drug reaction, characterised by a generalised erythematous rash often associated with facial oedema, involvement of internal organs (liver dysfunction), haematologic abnormalities (eosinophilia) and systemic illness (fever).

It is treated with high dose oral corticosteroids for several months. Common drugs implicated include the anti-epileptics, sulphur drugs and the penicillins.

Option A: Angioedema secondary to drug ingestion can also present with facial swelling but it occurs after a short latency period after

starting the drug. Patients may also have associated urticarial lesions.

Option C: Fixed drug eruption presents with one or several erythematous-to-dusky patches or plaques with central blister. It is not associated with systemic symptoms.

Option D: Toxic epidermal necrolysis is another severe idiosyncratic drug reaction that presents with extensive epidermal necrosis and mucosal involvement.

Option E: Viral exanthems may also present with a similar rash and systemic symptoms but a drug eruption is more likely in this case with the history of ingestion of oral anti-epileptics.



[Q: 3609] OnExamination 2012 - Dermatology

This child has this facial abnormality present since birth.

What other medical problems might she suffer from?

- 1- Aortic coarctation
- 2- Epilepsy
- 3- Liver haemangiomas
- 4- Posterior fossa abnormality
- 5- Renal artery stenosis

Answer & Comments

Answer: 2- Epilepsy

This patient has Sturge-Weber syndrome which presents with a facial port wine stain of the V1 +/- V2 or V3 segments. Other abnormalities include epilepsy, developmental delay and glaucoma.

Option A: Aortic coarctation is seen in PHACE syndrome which presents with segmental facial haemangioma, not a port wine stain.

Option C: Liver haemangiomas are seen in some patients with multiple cutaneous haemangiomas.

Option D: Posterior fossa abnormality, for example, Dandy-Walker malformation, is seen in patients with PHACE syndrome.

Option E: Renal artery stenosis is seen in neurofibromatosis.



[Q: 3610] OnExamination 2012 - Dermatology

A 16-year-old boy has severe inflammatory acne that has not responded to treatment with oral antibiotics. His dermatologist has decided to start him on oral isotretinoin.

Which of the following pairs of laboratory tests are required before and during treatment with oral isotretinoin?

- 1- Liver function tests and fasting lipid levels
- 2- Liver function tests and platelet levels
- 3- Platelet levels and serum electrolytes
- 4- Serum electrolytes and fasting lipid levels
- 5- Serum electrolytes and liver function tests

Answer & Comments

Answer: 1- Liver function tests and fasting lipid levels

Options B - E : These other pairs of laboratory tests are not required during treatment with oral isotretinoin.



[Q: 3611] OnExamination 2012 - Dermatology

A young male presented with multiple non-tender umbilicated papules in the suprapubic region and the scrotum.

What is the most likely diagnosis?

- 1- Folliculitis
- 2- Lichen planus
- 3- Molluscum contagiosum
- 4- Psoriasis
- 5- Verruca vulgaris

Answer & Comments

Answer: 3- Molluscum contagiosum

Option A: Folliculitis is a painful pustular eruption with follicular involvement.

Option B: Lichen planus presents as itchy violaceous polygonal papular lesions commonly over the ankles, wrists and low back.

Option D: Psoriasis presents as papulosquamous non-itchy plaques which exhibit micaceous scaling and usually occur over the extensors of the extremities.

Option E: Verruca vulgaris or common warts present as solitary or multiple painless skin lesions caused by human papillomavirus.



[Q: 3612] OnExamination 2012 - Dermatology

A young female presented with multiple non-tender, non-scaly, verrucous lesions on the leg and foot.

What is the most likely diagnosis?

- 1- Folliculitis
- 2- Lichen planus
- 3- Molluscum contagiosum
- 4- Psoriasis
- 5- Verruca vulgaris

Answer & Comments

Answer: 5- Verruca vulgaris

Option A: Folliculitis is a painful pustular eruption with follicular involvement.

Option B: Lichen planus presents as itchy violaceous polygonal papular lesions commonly over the ankles, wrists and low back.

Option C: Molluscum contagiosum presents usually as multiple umbilicated papules.

Option D: Psoriasis presents as papulosquamous non-itchy plaques which exhibit micaceous scaling and usually occur over the extensors of the extremities.



[Q: 3613] OnExamination 2012 - Dermatology

A patient presents with multiple vesicular lesions surrounded by erythema as shown following ingestion of sulfamethoxazole-trimethoprim.

What is the most likely diagnosis?

- 1- Erythema multiforme
- 2- Fixed drug eruption
- 3- Herpes zoster
- 4- Irritant contact dermatitis
- 5- Toxic epidermal necrolysis

Answer & Comments

Answer: 1- Erythema multiforme

Erythema multiforme classically presents as discrete vesicular or bullous lesions surrounded by a pale area and a ring of erythema. However all three zones may not always be evident. The eruption commonly follows the ingestion of the offending drug such as those belonging to the sulfa group.

Option B: Fixed drug eruption may present with sharply circumscribed pigmented macules, erythematous lesions or bullous lesions with a classical history of recurrence at the same site following the ingestion of the offending drug.

Option C: Herpes zoster presents as grouped vesicular eruptions on an erythematous base in dermatomal distribution.

Option D: Irritant contact dermatitis presents with acute onset vesicular eruptions at the site of contact of the irritant.

Option E: Toxic epidermal necrolysis is an acute dermatological emergency which

follows ingestion of offending drugs resulting in tender erythema and widespread bullae with subsequent skin necrosis and peeling.



[Q: 3614] OnExamination 2012 - Dermatology

A young HIV positive male presented with white discoloration of the nail plate.

What is the most likely diagnosis?

- 1- Candidal onychomycosis
- 2- Chronic paronychia
- 3- Irritant contact dermatitis
- 4- Pachyonychia congenita
- 5- Psoriatic nail dystrophy

Answer & Comments

Answer: 1- Candidal onychomycosis

Option B: Chronic paronychia presents with itchy painful swelling of the nail folds along with dystrophy of the nail plate.

Option C: Chronic exposure to irritants can lead to irregular buckling and dystrophy of the nail plate.

Option D: Pachyonychia congenita presents with dystrophic, thickened nails at or soon after birth along with palmoplantar keratoderma.

Option E: Psoriatic nail dystrophy presents with dystrophy of the nail plate, subungual hyperkeratosis, oil spots, onycholysis and splinter haemorrhages.



[Q: 3615] OnExamination 2012 - Dermatology

A 12-year-old child presents with an itchy rash around her ears which develops 24 to 48 hours after wearing earrings. She gives history of past episodes of similar complaints.

What is the most likely diagnosis?

- 1- Allergic contact dermatitis

- 2- Folliculitis
- 3- Herpes zoster
- 4- Irritant contact dermatitis
- 5- Paederus dermatitis

Answer & Comments

Answer: 1- Allergic contact dermatitis

Option B: Folliculitis presents with painful papulopustular follicular lesions.

Option C: Herpes zoster presents with acute onset grouped vesicular eruptions in dermatomal distribution.

Option D: Irritant contact dermatitis presents with vesicular eruption at sites of contact with the irritant. The onset of eruption in irritant contact dermatitis is sudden, compared to allergic contact dermatitis which typically develops over 24 to 48 hours. A burning sensation rather than itching is the predominant symptom in irritant contact dermatitis.

Option E: Paederus dermatitis is an acute irritant contact dermatitis which presents as plaques, linear streaks or 'kissing' lesions at sites where the offending pederin from the crushed beetle comes into contact with the skin.



[Q: 3616] OnExamination 2012 - Dermatology

Which of the following suggests a diagnosis of molluscum contagiosum rather than chickenpox?

- 1- Absence of erythema surrounding lesions
- 2- Lesions disappearing within a month
- 3- Positive contact history
- 4- Presence of macules and papules
- 5- Presence of pruritis

Answer & Comments

Answer: 1- Absence of erythema surrounding lesions

Molluscum contagiosum is caused by a deoxyribonucleic acid (DNA) pox virus.

The lesions are small, skin coloured papules with central umbilication. There is little surrounding inflammation and they may be spread following scratching to other sites.

Chickenpox lesions in the early stages may be mistaken for molluscum. However, the presence of associated macules and later vesicles and pustules help to differentiate them.

These lesions also affect the mucus membranes, and usually disappear within a few weeks, while molluscum can persist for up to a year.



[Q: 3617] OnExamination 2012 - Dermatology

A 30-year-old farmer from a tropical country presented with painless swelling of his foot of six months duration. He volunteered a history of a trivial trauma while working his fields eight to nine months back.

Following the injury he noticed a gradually progressive painless swelling in the mid sole which subsequently discharged black grains from sinuses which developed over the swelling.

Plain radiograph revealed soft tissue swelling with a well preserved skeletal architecture.

What is the most likely diagnosis?

- 1- Folliculitis
- 2- Impetigo
- 3- Lupus vulgaris
- 4- Mycetoma foot
- 5- Osteomyelitis

Answer & Comments

Answer: 4- Mycetoma foot

Mycetoma foot caused by *Madurella mycetomatis* follows traumatic inoculation of the fungus mostly on the foot and the lower leg.

The earliest stage is a firm, painless nodule but, with time, papules, pustules which break down to form draining sinuses that appear on the skin surface following which the affected area becomes hard and swollen usually without significant pain extension to underlying bones and joints gives rise to periostitis, osteomyelitis and arthritis.

Advanced cases may present with destruction of bone within an infected area giving rise to gross deformities. There are usually multiple sinus tracts draining pus and granules. Lymph node involvement is rare.

Options A and B: The condition does not occur on the sole.

Option C: Lupus vulgaris usually presents with an indolent gradually progressive plaque with periods of activity and remission with atrophic scarring.

Option E: Osteomyelitis will reveal painful swelling, draining sinuses and skeletal involvement on plain radiograph.



[Q: 3618] OnExamination 2012 - Dermatology

A 16-year-old boy presents with scaly patches on his scalp.

Examination reveals well-circumscribed, circular areas of hair loss, 2-5 cm in diameter with scaling and raised margins. There is no scarring.

What is the most likely cause in this patient?

- 1- Discoid lupus erythematosus
- 2- Lichen planus
- 3- Morphea

4- Systemic lupus erythematosus

5- Tinea capitis

Answer & Comments

Answer: 5- Tinea capitis

This patient has non-scarring alopecia due to invasion of hairs by dermatophytes, most commonly *Trichophyton tonsurans*.

The most common causes of non-scarring alopecia include:

Telogen effluvium

Androgenetic alopecia

Alopecia areata

Tinea capitis

Traumatic alopecia.

Less commonly, non-scarring alopecia is associated with lupus erythematosus and secondary syphilis.

Scarring alopecia is more frequently the result of a primary cutaneous disorder such as:

Lichen planus

Folliculitis decalvans

Cutaneous lupus

Linear scleroderma (morphea).



[Q: 3619] OnExamination 2012 - Dermatology

A 22-year-old female returns from a fortnight holiday in Cyprus with a tan and numerous scaly hypopigmented lesions on the neck and upper trunk.

What is the most likely diagnosis?

- 1- Chronic plaque psoriasis
- 2- Discoid eczema
- 3- Pityriasis rosea
- 4- Pityriasis versicolor

5- Seborrhoeic dermatitis

Answer & Comments

Answer: 4- Pityriasis versicolor

Pityriasis versicolor is caused by a superficial fungal infection with *Pityrosporum ovale*.

It usually presents as slightly scaly hypopigmented lesions. Growth is encouraged by an increase in temperature and suntan oils, and is most commonly seen after a sun holiday.

Chronic plaque psoriasis, discoid eczema and seborrhoeic dermatitis have distinct appearance and distribution.

Pityriasis rosea usually starts with a herald patch followed by small scaly lesions following the rib lines.



[Q: 3620] OnExamination 2012 - Dermatology

A 70-year-old female presents with a four month history of a dry, pruritic rash affecting the upper back and shins.

What is the most appropriate initial management of this patient?

- 1- Avoidance of contact irritants
- 2- Emollients
- 3- Skin biopsy
- 4- Take a detailed history to ascertain contact allergen
- 5- Topical corticosteroids

Answer & Comments

Answer: 2- Emollients

This lady is likely to have asteatotic eczema which is a common problem and will improve just with plain emollients.

Xerotic skin is commoner in the elderly population especially in the winter months due to the dry heat from central heating.

All the other suggestions may be appropriate in a patient resistant to first line treatment but the first line is to try emollients.



[Q: 3621] OnExamination 2012 - Dermatology

A 17-year-old boy is diagnosed with scabies.

Which of the following statements regarding scabies is correct?

- 1- Is best treated by salicylate emulsion
- 2- It can be spread by a droplet infection
- 3- It causes itchiness in the skin even where there is no obvious lesion to be seen
- 4- It is caused by *Staphylococcus aureus*
- 5- Typically affects the face

Answer & Comments

Answer: 3- It causes itchiness in the skin even where there is no obvious lesion to be seen

Scabies is an infestation of the skin with the microscopic mite *Sarcoptes scabiei*. Infestation is common, found worldwide, and affects people of all races and social classes.

Scabies spreads rapidly under crowded conditions where there is frequent skin-to-skin contact between people, such as in hospitals, institutions, child-care facilities, and nursing homes.

Scabies can spread by direct, prolonged, skin-to-skin contact, with a person already infested with scabies. Contact must be prolonged (a quick handshake or hug will usually not spread infestation).

Infestation is easily spread to sexual partners and household members. Infestation may also occur by sharing clothing, towels, and bedding.

Scabies is characterised by papular-like irritations, burrows or rash of the skin, especially the webbing between the fingers;

the skin folds on the wrist, elbow, or knee; the penis, the breast, or shoulder blades.

A number of treatments are available for the treatment of scabies, including permethrin ointment, benzyl benzoate, and oral ivermectin for resistant cases. Antihistamines and calamine lotion may be used to alleviate itching.



[Q: 3622] OnExamination 2012 - Dermatology

A 60-year-old woman presents with raised, erythematous lesions on the limbs and blistering in the mouth and eyes. She had been taking a number of drugs prescribed by her GP.

Which may be responsible for her presentation?

- 1- Nifedipine
- 2- Paracetamol
- 3- Paroxetine
- 4- Prednisolone
- 5- Sulfasalazine

Answer & Comments

Answer: 5- Sulfasalazine

This is a typical case of Stevens-Johnson syndrome.

Stevens-Johnson syndrome (SJS) is an immune-complex-mediated hypersensitivity complex that is a severe expression of erythema multiforme. It is now known also as erythema multiforme major.

SJS typically involves the skin and the mucous membranes. While minor presentations may occur, significant involvement of:

Oral
Nasal
Eye

Vaginal

Urethral

Gastrointestinal (GI)

Lower respiratory tract mucous membranes may develop in the course of the illness.

GI and respiratory involvement may progress to necrosis.

SJS is a serious systemic disorder with the potential for severe morbidity and even death.

The drugs most closely associated with causing Stevens-Johnson syndrome are:

Antibacterials

Sulfonamides

Anticonvulsants (oxicam)

Non-steroidal anti-inflammatory agents (piroxicam and tenoxicam)

Chlormezanone

Allopurinol.



[Q: 3623] OnExamination 2012 - Dermatology

A 50-year-old man presented in the summer complaining of itching and blistering of his hands and forehead.

On examination there were small areas of excoriation on the backs of his hands.

What is the most likely diagnosis?

- 1- Dermatitis herpetiformis
- 2- Lupus erythematosus
- 3- Pemphigoid
- 4- Pemphigus
- 5- Porphyria cutanea tarda (PCT)

Answer & Comments

Answer: 5- Porphyria cutanea tarda (PCT)

The distribution of the lesions suggests a photosensitive element.

Both lupus erythematosus and PCT are associated with a photosensitive element, however this is more typical of PCT.

PCT causes blistering of the hands and the forehead which usually heal with small scar and milia formation.

It is also associated with an excessive alcohol intake.



[Q: 3624] OnExamination 2012 - Dermatology

Which of the following concerning pityriasis rosea is correct?

- 1- It is characterised by flat scaly patches
- 2- It is due to a fungal infection
- 3- It is frequently associated with oro-genital itching
- 4- May be preceded by intense itching
- 5- Tends to recur after apparent cure

Answer & Comments

Answer: 1- It is characterised by flat scaly patches

Pityriasis rosea is a rash that can occur at any age, but it occurs most commonly in people between the ages of 10 and 35 years.

It may be set off by a viral infection but does not appear to be contagious; herpes viruses 6 and 7 have most often been associated with pityriasis rosea. It is not caused by a fungus.

It is not related to foods, medicines, or stress. It most often affects teenagers or young adults.

The condition often begins as a large single pink patch on the chest or back. This patch may be scaly and is called a 'herald' or 'mother' patch.

Within a week or two, more pink patches, sometimes hundreds of them, appear on the body and on the arms and legs. Patches may also occur on the neck, and though rare, the face.

The oval patches follow the line of the ribs like a fir tree. They have a dry surface and may have an inner circlet of scaling.



[Q: 3625] OnExamination 2012 - Dermatology

A 75-year-old female presents with generalised erythema and pustule formation.

She has a history of psoriasis and has recently been treated with oral prednisolone for asthma.

What is the most appropriate next course of action?

- 1- Admission to hospital
- 2- Patch testing
- 3- Psoralen with ultraviolet-A therapy (PUVA)
- 4- Skin biopsy
- 5- Treatment with erythromycin as an outpatient

Answer & Comments

Answer: 1- Admission to hospital

This is erythroderma which is a dermatological emergency.

The patient needs admission with close supervision and supportive treatment with IV fluids and antibiotics.



[Q: 3626] OnExamination 2012 - Dermatology

A 45-year-old woman is admitted with a spiking temperature and sweats.

She has been unwell for the last three weeks with flitting arthralgia and lethargy. There is a rash over her trunk which is most prevalent in the mornings.

Blood cultures are sterile. Her recent transthoracic echocardiogram is normal. ESR is 56 mm/hour. Her ferritin is elevated at 6000 mg/l. Autoimmune screen is negative.

What is the likely diagnosis?

- 1- Adult onset Still's disease
- 2- Bacterial endocarditis
- 3- Meningitis
- 4- Rheumatoid arthritis
- 5- Systemic lupus erythematosus

Answer & Comments

Answer: 1- Adult onset Still's disease

Still's disease is a febrile syndrome in young adults (16-35 years) which affects multiple organs. The diagnosis is mainly one of exclusion.

The clinical features include:

High spiking fever (once a day, with return of temperature to normal)

Arthralgia/arthritis

Sore throat

Transient maculopapular rash (mildly pruritic in 1/3)

Lymphadenopathy

Hepatosplenomegaly and

Pleuritis/pericarditis.

Rarely there may be

Aseptic meningitis

Cranial nerve palsies

Iritis and

Peripheral neuropathy.

There is often delay in diagnosis.

Hyperferritinaemia (greater than five times normal) is present in 90% of cases.



[Q: 3627] OnExamination 2012 - Dermatology

A 12-year-old girl has severe atopic dermatitis which has not been well controlled with topical treatments, despite good compliance. Her dermatologist has decided to start her on treatment with oral ciclosporin.

Which of the following parameters needs to be regularly monitored while she is on treatment with ciclosporin?

- 1- Blood glucose levels
- 2- Blood pressure
- 3- Bone age
- 4- Height
- 5- Pubertal staging

Answer & Comments

Answer: 2- Blood pressure

Options A, C, D and E: These other parameters are not affected by ciclosporin therapy.



[Q: 3628] OnExamination 2012 - Dermatology

Deficiency of which one of the following trace elements is implicated as a cause of cardiomyopathy?

- 1- Chromium
- 2- Copper
- 3- Manganese
- 4- Selenium
- 5- Zinc

Answer & Comments

Answer: 4- Selenium

Selenium deficiency is one of the reversible causes of dilated cardiomyopathy.



[Q: 3629] OnExamination 2012 -
Dermatology

A young 3-month-old presented with a rash of two days' duration along lips, nose and adjacent right cheek.

The mother gave history of a short febrile illness preceding the rash. Past history of similar complaints was present.

What is the most likely diagnosis?

- 1- Allergic contact dermatitis
- 2- Folliculitis
- 3- Hand, foot and mouth disease
- 4- Herpes simplex
- 5- Impetigo

Answer & Comments

Answer: 4- Herpes simplex

Herpes Simplex virus infection is common in children and in adolescents and is caused by two closely related virus types, type 1 and type 2. It commonly presents with recurrent painless grouped vesicles around mucocutaneous junctions such as the mouth and the nose. The first episode may be painful. Subsequent episodes present with mild discomfort with a history for per-eruption aura over the affected area. Management is largely symptomatic in recurrent episodes and topical 5% aciclovir cream may reduce discomfort. The case presented here reveals perinasal and perioral involvement typical of herpes simplex. Secondary impetiginization may be evident in some cases.

Option A: Allergic contact dermatitis will present with itchy papulo-vesicular eruption at the site of contact of the allergen.

Option B: Follicular involvement is evident in a case of painful papulopustular lesions. It is commoner in glabrous areas of the skin.

Option C: Hand, foot and mouth disease presents with vesicular and bullous lesions over palms, soles, buttocks and oral erosions. History of similar complaints may be present in contacts.

Option E: Superficial infection of the skin caused by *Staphylococcus aureus* and *Streptococcus pyogenes* is common in children. Impetigo classically involves the epidermis and presents with honey coloured crusts.



[Q: 3630] OnExamination 2012 -
Dermatology

A 30-year-old mother with her 6-year-old daughter presents with itching of the scalp with hair loss of one month duration.

Examination revealed patches of partial alopecia, sharply cut off circular in shape, with numerous broken-off, dull grey hairs in the alopecic patches.

Wood's lamp examination revealed green fluorescence.

What is the most likely diagnosis?

- 1- Alopecia areata
- 2- Seborrhoeic dermatitis
- 3- Secondary syphilis
- 4- Tinea capitis
- 5- Trichotillomania

Answer & Comments

Answer: 4- Tinea capitis

Tinea capitis or ringworm of the scalp is a common condition affecting children and uncommonly adults, where the adults are usually secondarily infected.

The response to this infection is variable, depending on the type of hair invasion, the level of host resistance and the degree of inflammatory host response. The appearance therefore may vary from a few dull grey,

broken-off hairs with a little scaling, detectable only on careful inspection, to a severe, painful, inflammatory mass covering most of the scalp. Itching is variable. Sharing of combs facilitates spread in the family.

Option A: Alopecia areata presents as non-itchy areas of hair loss with exclamation mark hairs.

Option B: Seborrhoeic dermatitis presents with diffuse greasy scaling. Hair loss in such localised patches is not a feature.

Option C: Secondary syphilis presents with moth-eaten alopecia.

Option E: Trichotillomania presents as patchy hair loss with hair of varying lengths in different as well as the same patch. Invariably there is a history of a family member having observed serial plucking of hair by the patient.



[Q: 3631] OnExamination 2012 - Dermatology

Which of the following is true regarding diabetic foot ulceration?

- 1- Autonomic neuropathy results in reduced peripheral blood flow
- 2- Callus formation at pressure areas is an important predictor of ulceration
- 3- Plantar ulceration is most commonly due to atherosclerosis
- 4- Skin infection is the most common initiating event in ulceration
- 5- Radiography can readily distinguish between Charcot's joint and osteomyelitis

Answer & Comments

Answer: 2- Callus formation at pressure areas is an important predictor of ulceration

Callus formation at pressure areas is an important predictor of potential ulceration.

Plantar ulceration is usually a consequence of neuropathy.

Minor skin trauma is probably the most common initiating event.

Studies have shown that autonomic neuropathy increases peripheral blood flow, probably as a result of reduced arteriovenous shunting.

It is difficult to distinguish radiographically between Charcot's joint and osteomyelitis, as neither have specific signs in their early stages.



[Q: 3632] OnExamination 2012 - Dermatology

A 59-year-old patient of South Asian origin presents with a widespread blistering rash.

Which of the following features would be consistent with a diagnosis of pemphigus?

- 1- Acanthosis
- 2- Blisters arising within the subepidermal area
- 3- IgA antibodies
- 4- Oral involvement
- 5- Treatment with methotrexate

Answer & Comments

Answer: 4- Oral involvement

Pemphigus is associated with loss of intercellular cohesion in the lower part of the epidermis, leading to acantholysis (separation of keratinocytes). Pemphigus is classically associated with flaccid blistering, and often with immunoglobulin (Ig)G antibodies.

Treatment may be successful with azathioprine.

Pemphigoid is associated with subepidermal bullae.



[Q: 3633] OnExamination 2012 - Dermatology

An 82-year-old lady had a history of a red

facial rash and has suffered with venous eczema of the legs. She was treated for acne rosacea.

On examination, she was noted to have blue-grey discolouration of both legs.

What drug is most likely to have caused this?

- 1- Amiodarone
- 2- Ciprofloxacin
- 3- Doxycycline
- 4- Minocycline
- 5- Oxytetracycline

Answer & Comments

Answer: 4- Minocycline

This patient has developed skin pigmentation of her legs as a side effect of treatment of her acne rosacea.

Tetracyclines are commonly used treatment for acne rosacea. Long-term use of minocycline in particular has been associated with non-dose dependent blue-grey pigmentation of skin in the lower legs, and mucosal pigmentation. This is more common in the elderly. On biopsy, intracellular pigment is seen in the dermis and the subcutaneous tissue and stains positively for melanin and iron. If not extensive, hyperpigmentation may partially regress after minocycline is discontinued. If it persists, alexandrite laser therapy can be effective.

Amiodarone can also cause a blue-grey slate discolouration of the skin, typically in sun exposed areas. You would therefore expect the face to be affected, and also amiodarone is not a treatment for acne rosacea which has been mentioned in this question to lead you to the correct answer.

Hypersensitivity to the sun has been described with ciprofloxacin, but discolouration as in this scenario is not recognised.

Oxytetracycline and doxycycline can lead to photosensitivity, but skin pigmentation seems to be specific to minocycline rather than a class effect of the tetracyclines.



[Q: 3634] OnExamination 2012 - Dermatology

A 35-year-old woman presents with a facial rash which had been present for one year.

On examination she had erythematous, scaly, indurated plaques on both cheeks with areas of scarring alopecia. Hyperkeratosis over dilated hair follicles was also seen.

What is the diagnosis?

- 1- Acne rosacea
- 2- Discoid lupus erythematosus
- 3- Impetigo
- 4- Lupus pernio
- 5- Psoriasis

Answer & Comments

Answer: 2- Discoid lupus erythematosus

The patient has discoid lupus as suggested by the indurated plaques on cheeks, the scarring alopecia and hyperkeratosis over the hair follicles.



[Q: 3635] OnExamination 2012 - Dermatology

A 74-year-old man with a thirty year history of psoriasis presented with generalised erythroderma of three days duration.

Examination reveals him to be shivering but otherwise well. He was treated as an inpatient with emollients and attention to fluid replacement and temperature control but failed to improve after five days.

What is the most appropriate next treatment?

- 1- Oral hydroxychloroquine
- 2- Oral methotrexate

- 3- Oral prednisolone
- 4- Topical coal tar
- 5- Topical Dithranol

Answer & Comments

Answer: 2- Oral methotrexate

Erythroderma is an emergency as patients are susceptible to profound dehydration, infection and hypothermia.

Methotrexate would be the only correct treatment for someone with erythrodermic psoriasis.

Steroids could lead to unstable pustular psoriasis and would not generally work.

Hydroxychloroquine has little effect on psoriasis.

Topical coal tar and Dithranol are good treatments for chronic plaque psoriasis but are highly irritant and would make the erythroderma much more inflamed and deteriorate his condition.



[Q: 3636] OnExamination 2012 - Dermatology

Which of the following is true of cutaneous anthrax?

- 1- Causes a black eschar which overlies pus
- 2- Is very likely to occur in subjects exposed to anthrax spores
- 3- Lesions are associated with marked oedema
- 4- Lesions are usually painful and tender
- 5- Mortality is approximately 20% despite antibiotic therapy

Answer & Comments

Answer: 3- Lesions are associated with marked oedema

Anthrax is caused by *Bacillus anthracis* a Gram positive rod.

Cutaneous anthrax is caused by direct contact of the bacteria into an open wound (usually touching an infected animal). Cutaneous anthrax is associated with a black eschar without pus, tends to be painless and to have widespread oedema.

Without antibiotics mortality is of the order of 20%, but with antibiotics, mortality is low, which contrasts with pulmonary anthrax.



[Q: 3637] OnExamination 2012 - Dermatology

Which of the following is aggravated by exposure to sunlight?

- 1- Acne vulgaris
- 2- Acute intermittent porphyria
- 3- Pellagra
- 4- Pseudoxanthoma elasticum
- 5- Psoriasis

Answer & Comments

Answer: 3- Pellagra

Exacerbation or localisation of other dermatoses is characteristic of:

- Pellagra
- Hartnup's disease
- Lupus erythematosus
- Darier's disease
- Rosacea
- Scleroderma
- Actinic lichen planus
- Lymphocytoma.



[Q: 3638] OnExamination 2012 - Dermatology

A 25-year-old woman has just been diagnosed with chronic cutaneous lupus erythematosus. She has no other clinical or laboratory

evidence to suggest systemic involvement. Apart from advice on sun avoidance, her dermatologist has decided to start her on oral hydroxychloroquine.

While on treatment with hydroxychloroquine, she requires pre-treatment evaluation and regular monitoring by which of the following specialists?

- 1- Cardiologist
- 2- Gastroenterologist
- 3- Haematologist
- 4- Neurologist
- 5- Ophthalmologist

Answer & Comments

Answer: 5- Ophthalmologist

Eye toxicity is one of the most serious side effects of treatment with antimalarials and requires regular screening. The cornea and macula may be affected by antimalarial medications.

Options A, B, C, and D : Regular monitoring by these specialists is not warranted for patients on treatment with antimalarials, although their services may be required in the event of the uncommon occurrence of systemic involvement of lupus in this patient.



[Q: 3639] OnExamination 2012 - Dermatology

A 3-year-old child is brought to you with a boggy swelling over the scalp with multiple pustules surmounting the swelling along with alopecia.

What is the most likely diagnosis?

- 1- Favus
- 2- Folliculitis
- 3- Impetigo
- 4- Kerion
- 5- Seborrheic dermatitis

Answer & Comments

Answer: 4- Kerion

Option A: Favus, a form of tinea capitis, presents with lesions characterised by yellow cup-shaped crusts termed scutula, which surround the infected hair follicles.

Option B: Folliculitis presents as painful follicular pustules.

Option C: Impetigo presents as vesiculobullous lesions or erosions covered with honey coloured crusts.

Option E: Seborrheic dermatitis is an itchy scalp condition presenting with greasy scaling.

Kerion presents with an inflammatory swelling on the scalp or the glabrous skin with numerous pustules in response to zoophilic fungi resulting in severe scarring alopecia in untreated cases.



[Q: 3640] OnExamination 2012 - Dermatology

An elderly male presented with dystrophic nail plates as shown along with an itchy rash of six months' duration on the adjacent areas of the fingers and both groins.

What is the most likely diagnosis?

- 1- Chronic Paronychia
- 2- Irritant contact dermatitis
- 3- Onychomycosis
- 4- Pachyonychia congenita
- 5- Psoriatic nail dystrophy

Answer & Comments

Answer: 3- Onychomycosis

Option A: Chronic paronychia presents with itchy painful swelling of the nail folds along with dystrophy of the nail plate.

Option B: Chronic exposure to irritants can lead to irregular buckling and dystrophy of the nail plate.

Option D: Pachyonychia congenita presents with dystrophic, thickened nails at or soon after birth along with palmoplantar keratoderma.

Option E: Psoriatic nail dystrophy presents with dystrophy of the nail plate, subungual hyperkeratosis, oil spots, onycholysis and splinter haemorrhages. Although it can involve the flexures such as the groin the rash is not itchy.

Dermatophyte fungal infection of the nail presents with Dystrophy of the affected nails. A moth eaten appearance as evident in the middle finger is characteristic. Commonly the affected individuals have evidence of dermatophytosis elsewhere, such as Tinea pedis, Tinea corporis, Tinea cruris (as in this case).



[Q: 3641] OnExamination 2012 - Dermatology

A middle aged female patient presented an anaesthetic plaque on the face of three months duration.

What is the most likely diagnosis?

- 1- Granuloma annulare
- 2- Hansen's disease
- 3- Sarcoidosis
- 4- Tertiary syphilis
- 5- Urticaria

Answer & Comments

Answer: 2- Hansen's disease

Option A: The localised form of granuloma annulare presents with annular or arcuate plaques. The margin may be continuous or consist of discrete papules coalescing together. Sensation is preserved.

Option C: Sarcoidosis may present with annular, arcuate lesions or papulosquamous lesions. Sensation is preserved.

Option D: Tertiary syphilis presents with nodular syphilide, papulosquamous lesions or gumma. Sensation is preserved.

Option E: Urticaria presents with recurrent wheals which usually subside in 24 hours. There is no sensory loss.

Hansen's disease, more commonly known as leprosy, is the correct option here. It classically produces reddish patches or hypopigmented areas of skin, with reduced sensation. These are required for the disease to be diagnosed.



[Q: 3642] OnExamination 2012 - Dermatology

A young child with a known case of plain warts on the face developed the shown linear distribution of the lesions.

What is this phenomenon called?

- 1- Auspitz' sign
- 2- Carpet tack sign
- 3- Gorlin sign
- 4- Koebner phenomenon
- 5- Raynaud's phenomenon

Answer & Comments

Answer: 4- Koebner phenomenon

Option A: Auspitz' sign is seen in psoriasis where the lesion upon scraping with a glass slide reveals pin-point bleeding on account of suprapapillary thinning of the epidermis.

Option B: Carpet tack sign - In discoid lupus erythematosus the removal of scale reveals multiple horny plugs on the under surface of the scale giving the appearance of carpet tacks.

Option C: Gorlin sign is the ability to touch the tip of the nose with the tongue seen in Ehlers-Danlos syndrome and some in the general population.

Option E: Raynaud's phenomenon is a vasospastic disorder characterised by vasospasms that decrease blood supply to the respective regions usually the hands and feet and infrequently the ear lobes, lips and nose. Cold is the classic trigger of the phenomenon.



[Q: 3643] OnExamination 2012 - Dermatology

A middle aged male farmer presented with multiple itchy inflammatory lesions over the chin. He volunteered a history of working at a cattle farm.

What is the most likely diagnosis?

- 1- Allergic contact dermatitis
- 2- Carbuncle
- 3- Folliculitis
- 4- Kerion
- 5- Sycosis

Answer & Comments

Answer: 4- Kerion

Option A: Allergic contact dermatitis presents with itchy vesicular eruption at the site of contact with the allergen.

Option B: Carbuncle presents in a diabetic with a painful inflammatory swelling surmounted with multiple draining sinuses.

Option C: Folliculitis presents with painful follicular pustules.

Option E: Sycosis presents as subacute or chronic pyogenic infection involving the whole depth of the follicle.



[Q: 3644] OnExamination 2012 - Dermatology

A 5-year-old boy was brought in with crops of asymptomatic rash over the trunk of two months' duration.

Examination revealed skin coloured to pearly white and hemispherical to umbilicated papular lesions. Each one is approximately 4 mm in diameter and there are approximately 20 of these lesions present.

What is the most likely diagnosis?

- 1- Cutaneous cryptococcosis
- 2- Folliculitis
- 3- Herpes simplex
- 4- Molluscum contagiosum
- 5- Warts

Answer & Comments

Answer: 4- Molluscum contagiosum

Option A: HIV positive patients may present with cryptococcosis.

Cryptococcus neoformans infection affects 5-10% of patients with AIDS in the UK and USA and 30-40% in Africa. Up to 20% of patients with disseminated disease may have skin involvement.

In HIV/ AIDS cryptococcal skin involvement should be suspected when papulonodular necrotising skin lesions with central umbilication, like molluscum contagiosum are encountered in such patients along with pulmonary or neurological disease. Hence cutaneous cryptococcosis must be kept as a differential in a case of umbilicated lesions on the skin.

Option B: Folliculitis presents with painful papulopustular follicular lesions.

Option C: Herpes simplex infection presents with recurrent grouped vesicular eruptions on an erythematous base at mucocutaneous junctions.

Option E: Warts present with verrucous plaques and papules more commonly over extremities.



[Q: 3645] OnExamination 2012 - Dermatology

An 18-year-old woman attends antenatal clinic 12 weeks into her pregnancy where the doctor incidentally notes numerous small lumps over her trunk and freckles in her axillae.

She reported that none of her relatives had any similar features.

What is the most likely diagnosis?

- 1- Acanthosis nigricans
- 2- Dysplastic naevus syndrome
- 3- Mastocytosis
- 4- Neurofibromatosis
- 5- Tuberous sclerosis

Answer & Comments

Answer: 4- Neurofibromatosis

The patient is likely to have neurofibromatosis (NF1).

To be given the diagnosis of NF1, an individual must have at least two of the following features. Some people with NF1 have only two, while others can have several of these features:

Six or more café-au-lait spots, or coffee-coloured birthmarks, each measuring over an inch in adults (1/4 inch in children)

Two or more neurofibromas or a plexiform neurofibroma

Freckles under the arm or in the groin region

A tumour of the nerve to the eye called an optic glioma

Two or more spots on the iris of the eye called Lisch nodules

A problem of one of the bones such as bowing of a leg, with or without a fracture

A parent, brother, sister, or child with NF1.



[Q: 3646] OnExamination 2012 - Dermatology

This 8-year-old boy presents with a bizarre pattern of non-scarring hair loss which started about one year ago. He has no other systemic complaints.

On examination, you notice short hairs of different lengths within the areas of alopecia.

What is your most likely diagnosis?

- 1- Androgenetic alopecia
- 2- Alopecia areata
- 3- Secondary syphilis
- 4- Telogen effluvium
- 5- Trichotillomania

Answer & Comments

Answer: 5- Trichotillomania

Trichotillomania is more commonly seen in children and adolescents compared to adults. It is regarded as a primary psychiatric disorder and results from repetitive hair manipulation by the patient's own hands. It results in a patchy non-scarring alopecia that often has a bizarre distribution. Small, broken hairs of varying lengths may be seen within the patches of alopecia.

Option A: Androgenetic alopecia does not occur in the pre-pubertal age group.

Option B: Alopecia areata is a differential diagnosis to consider in patients presenting with trichotillomania. However, it usually does not lead to a 'bizarre' distribution and the patches of alopecia are usually 'clean' without short, broken, hairs of varying lengths.

Option C: Secondary syphilis may lead to a non-scarring alopecia with a 'moth-eaten'

appearance. However, it occurs in sexually active persons.

Option D: Telogen effluvium occurs one to three months after a major stress to the body, for example, illness, surgery, child birth. It leads to a diffuse form of non-scarring alopecia.



[Q: 3647] OnExamination 2012 - Dermatology

A 16-year-old boy presents with erythema nodosum.

Which of the following should be considered?

- 1- Cytomegalovirus infection
- 2- Kawasaki disease
- 3- Reiter's disease
- 4- Toxoplasmosis
- 5- Ulcerative colitis

Answer & Comments

Answer: 5- Ulcerative colitis

Erythema nodosum is characterised by painful, indurated, shiny, red, hot, elevated nodules 1-3 cm diameter particularly on the shins. There may be associated fever, malaise, and arthralgia ± hilar adenopathy.

Over a period of days they become violaceous, then dull purple, then fade like a large bruise without residual ulceration or scar. There may be crops over three to six weeks.

They are uncommon under the age of 6, and are commoner in females than males.

Causes include:

Infections

Bacteria: Streptococci, leptospirosis, cat-scratch disease, psittacosis, Yersinia.

Viruses: EBV.

Other

TB, tularaemia, histoplasmosis, coccidioidomycosis.

Drugs

Sulphonamides, oral contraceptive pill.

Systemic diseases

SLE, vasculitis, regional enteritis, ulcerative colitis, Behçet syndrome, sarcoidosis.



[Q: 3648] OnExamination 2012 - Dermatology

This 45-year-old man presents with these lesions on his face for the past three years. The lesions are worse after sun exposure.

A skin biopsy will reveal which of the following histological patterns?

- 1- Interface dermatitis
- 2- Intraepidermal bulla
- 3- Panniculitis
- 4- Spongiotic dermatitis
- 5- Subepidermal bulla

Answer & Comments

Answer: 1- Interface dermatitis

This patient has discoid lupus erythematosus. A skin biopsy will reveal interface dermatitis, characterised by basal vacuolar change, necrotic keratinocytes and pigment incontinence. This reaction represents damage to the epidermis from the inflammation.

Option B: An intraepidermal bulla is seen in intraepidermal blistering disorders, for example, pemphigus.

Option C: Panniculitis is inflammation of the subcutaneous fat and is seen classically in erythema nodosum.

Option D: Spongiotic dermatitis is the histological pattern seen in eczemas and other

papulosquamous disorders, for example, pityriasis rosea.

Option E: A subepidermal bulla is seen in subepidermal blistering disorders, for example, bullous pemphigoid.



[Q: 3649] OnExamination 2012 - Dermatology

A young female patient presented with an acute onset itchy rash on the face following the use of a new face cream for the first time.

What is the most likely diagnosis?

- 1- Allergic contact dermatitis
- 2- Atopic dermatitis
- 3- Erythema multiforme
- 4- Herpes zoster
- 5- Irritant contact dermatitis

Answer & Comments

Answer: 5- Irritant contact dermatitis

Irritant contact dermatitis presents with an acute eczematous reaction with erythema, vesiculation, crusting and itching or a burning sensation at the site of the contact of the irritant. A sensitisation dose is not required as in allergic contact dermatitis.

Option A: Allergic contact dermatitis may present with an acute eczematous reaction at the site of contact with the allergen after a period of sensitisation.

Option B: Atopic dermatitis may present in the acute phase with an acute eczematous reaction on the face in infants. In adults the flexures are involved.

Option C: Erythema multiforme classically presents with target lesions with a central bullous lesion surrounded by an erythematous halo following the intake of an offending drug.

Option D: Herpes zoster presents with vesicobullous lesions in a dermatomal distribution.



[Q: 3650] OnExamination 2012 - Dermatology

A middle aged male presented with a lesion of six months' duration on his neck (as shown) with a history of recurrent episodes of pustulation and scarring.

Plain radiograph of the chest revealed non-homogenous opacities in both lungs.

What is the most likely diagnosis?

- 1- Lupus vulgaris
- 2- Miliary tuberculosis
- 3- Scrofuloderma
- 4- Squamous cell carcinoma
- 5- Tuberculous chancre

Answer & Comments

Answer: 1- Lupus vulgaris

Option A: because lupus vulgaris is a chronic, progressive form of cutaneous tuberculosis characterised commonly by annular plaques with areas of activity and scarring. Lesions may either appear as a result of endogenous spread of bacilli via haematogenous route from an endogenous focus such as pulmonary tuberculosis or at a site of exogenous direct inoculation. The lesion in the photograph represents one such classic lesion.

Option B: Miliary tuberculosis manifests as disseminated erythematous macules, papules as well as purpuric lesions, due to haematogenous spread in a patient with tuberculosis.

Option C: Scrofuloderma presents initially as a subcutaneous nodule which later breaks down to represent skin ulceration over an underlying area of tuberculous focus such as a lymph node, bone or joint.

Option D: Squamous cell carcinoma typically arises from an unhealthy skin usually in areas of chronic photo-damage as an indurated scaly and fissured plaque.

Option E: Tuberculous chancre presents initially as an inflammatory papule at the site of inoculation which later breaks down into a non-healing, shallow, undermined ulcer with a granulomatous base followed by painless regional lymphadenopathy.



[Q: 3651] OnExamination 2012 - Dermatology

A middle aged male presented with dystrophic nail plates as shown with an itchy rash of six months' duration in both groins.

What is the most likely diagnosis?

- 1- Chronic paronychia
- 2- Irritant contact dermatitis
- 3- Onychomycosis
- 4- Pachyonychia congenita
- 5- Psoriatic nail dystrophy

Answer & Comments

Answer: 3- Onychomycosis

Option A: Chronic paronychia presents with itchy painful swelling of the nail folds with dystrophy of the nail plate.

Option B: Chronic exposure to irritants can lead to irregular buckling and dystrophy of the nail plate.

Option D: Pachyonychia congenita presents with dystrophic, thickened nails at or soon after birth along with palmoplantar keratoderma.

Option E: Psoriatic nail dystrophy presents with dystrophy of the nail plate, subungual hyperkeratosis, oil spots, onycholysis and splinter haemorrhages. Although it can involve the flexures such as the groin the rash is not itchy.



[Q: 3652] OnExamination 2012 - Dermatology

A middle aged male with a known case of bronchial asthma presented with recurrent episodes of itching, vesiculation and oozing over the cubital fossae and popliteal fossae.

What is his diagnosis?

- 1- Atopic dermatitis
- 2- Dermatitis herpetiformis
- 3- Impetigo
- 4- Irritant contact dermatitis
- 5- Pemphigus vulgaris

Answer & Comments

Answer: 1- Atopic dermatitis

Option B: Dermatitis herpetiformis is an autoimmune blistering disorder associated with a gluten-sensitive enteropathy. Dermatitis herpetiformis is characterised by extensor involvement with grouped excoriations, papulovesicular eruptions and urticarial lesions.

Option C: Impetigo presents in children with painful bullous lesions with honey coloured crusts.

Option D: Irritant contact dermatitis presents with vesicular eruption at sites of contact with the irritant, often on the exposed areas such as extremities. A burning sensation is common as opposed to the itching experienced in allergic contact dermatitis.

Option E: Pemphigus vulgaris presents with vesiculobullous lesions and erosions on normal-appearing skin.



[Q: 3653] OnExamination 2012 - Dermatology

A middle aged male presented with sudden onset non-tender annular erythematous plaques with pustulation.

He had been managed with systemic steroids in the recent past for an acute exacerbation of bronchial asthma. He gave a history of recurrent episodes of scaly plaques in the past.

What is the most likely diagnosis?

- 1- Allergic contact dermatitis
- 2- Folliculitis
- 3- Pemphigus vulgaris
- 4- Pustular psoriasis
- 5- Subcorneal pustular dermatosis

Answer & Comments

Answer: 4- Pustular psoriasis

Option A: Allergic contact dermatitis will present with itchy papulo-vesicular eruption at the site of contact of the allergen.

Option B: Folliculitis presents with painful folliculocentric pustules.

Option C: Pemphigus vulgaris presents with vesiculobullous lesions and erosions on normal appearing skin.

Option E: Subcorneal pustular dermatosis occurs mainly in flexures and on the flexor aspect of the limbs. It presents with characteristic pustules, with pus which accumulates in the lower half of a fully developed pustule, leaving clear fluid in the upper half. Pustules may coalesce, forming annular or serpiginous patterns with a scaly edge. The eruption fades to leave faint hyperpigmentation and successive such episodes may occur.



[Q: 3654] OnExamination 2012 - Dermatology

A 2-year-old child presented with multiple (more than three) hypopigmented lesions on the anterior chest wall and trunk since the age of one year. Parents volunteered a history of recurrent seizures.

Examination also revealed few rubbery pinkish plaques on the low back.

What is the most likely diagnosis of the hypopigmented lesions?

- 1- Ash leaf macule
- 2- Hansen's disease
- 3- Nevus depigmentosus
- 4- Pityriasis alba
- 5- Vitiligo

Answer & Comments

Answer: 1- Ash leaf macule

Option B: Hansen's disease presents uncommonly at this age. Skin manifestations include hypopigmented macules which may be hypo-anaesthetic to normo-anaesthetic depending on the spectrum of the disease, along with plaques in the tuberculoid pole which would be hypo-anaesthetic.

Option C: Nevus depigmentosus and option E, vitiligo, present with depigmented lesions.

Option D: Pityriasis alba: the individual lesions are rounded, oval or irregular hypopigmented macules which are usually not well margined.

The lesions are often slightly erythematous and have fine scaling. The initial erythema subsides leaving only persistent fine scaling and hypopigmentation.



[Q: 3655] OnExamination 2012 - Dermatology

A 12-year-old child presents with the above depressed sclerotic linear lesion over the right frontoparietal scalp of five years duration. There is a history of initial progression and thereafter a static phase for the past two years.

Radiographs and neuroimaging reveal no abnormal findings. There is no history of

seizures or any history of neurological involvement.

What should be the first line of management?

- 1- High dose IV methylprednisolone
- 2- No active management
- 3- Prophylactic anti-epileptics
- 4- Systemic corticosteroids
- 5- Urgent surgery

Answer & Comments

Answer: 2- No active management

En coup de sabre, a variant of scleroderma is characterised by a linear, atrophic depression affecting the frontoparietal aspect of the face and scalp, suggestive of a stroke from a sword, as shown in the image. Such lesions may extend into the underlying tissues. Scalp involvement results in scarring alopecia.

Option A and Option D: Emergent measures in the absence of active disease progression or neuro-ocular complications are not indicated.

Option C: Prophylactic anti-epileptics have no role as the case has had no history of seizures, neuroimaging is normal and the condition is not progressing.

Option E: Surgery has no role presently.

*The management of this case is controversial. Some paediatric dermatologists may give a trial of methotrexate, as the disease may still be slowly progressing and treatment may prevent worsening cosmetic disfigurement.



[Q: 3656] OnExamination 2012 - Dermatology

A middle aged lady working in a restaurant kitchen presented with swelling of her right thumb of two months duration.

What is the most likely diagnosis?

- 1- Acute paronychia

- 2- Candidal paronychia
- 3- Dermatophytosis
- 4- Ingrowing toe nail
- 5- Pustular psoriasis

Answer & Comments

Answer: 2- Candidal paronychia

Option A: Acute paronychia is an acute tender inflammatory swelling of the nail folds caused by Staphylococcus aureus commonly.

Option C: Dermatophytosis presents with onychomycosis with a moth eaten appearance of the nail plate.

Option D: Ingrowing toe nail presents with acute onset inflammation of the affected digit with the distal corner of the nail plate buried in the lateral nail fold.

Option E: Pustular psoriasis variant acrodermatitis continua of

Hallopeau or parakeratosis pustulosa affects the nail plate which may be lifted by sterile pustules with associated erythema and discomfort and subsequent nail loss.



[Q: 3657] OnExamination 2012 - Dermatology

A young male presented with multiple nodulocystic lesions and comedones over the face.

What is the most likely diagnosis?

- 1- Acne
- 2- Folliculitis
- 3- Hidradenitis suppurativa
- 4- Pyoderma faciale
- 5- Sycosis barbae

Answer & Comments

Answer: 1- Acne

Option B: Folliculitis is a painful pustular eruption with follicular involvement.

Option C: Hidradenitis suppurativa presents as tender erythematous papules, abscesses and dermal contractures in the apocrine gland bearing areas of the skin such as the axillary regions.

Option D: Pyoderma faciale a rare complication of rosacea presents with multiple nodules, abscesses and sinus tracts along with systemic signs. Comedones are absent.

Option E: Sycosis barbae presents as painful pustular eruptions in the glabrous areas of the skin.



[Q: 3658] OnExamination 2012 - Dermatology

A 17-year-old man comes to the clinic. He has recently returned from a holiday to Spain with his friends and is very disappointed with the quality of his tan, as there appear to be large depigmented areas on the skin of his abdomen and on his back. He says the areas are itchy.

On examination you confirm the depigmentation, and there is superficial scaling over the areas.

Which of the following is the most appropriate treatment?

- 1- Oral antifungals
- 2- Oral corticosteroids
- 3- Reassurance
- 4- Topical antifungals
- 5- Topical corticosteroids

Answer & Comments

Answer: 4- Topical antifungals

This patient has clinical findings which are typical of those seen in pityriasis versicolor, caused by a fungus known as Malassezia

furfur. This causes more of a problem in hot weather, is present on the skin of the trunk, and leads to the depigmentation seen here.

Topical antifungals are the treatment of choice; if the depigmentation is extensive, a systemic compound like fluconazole may be used.



[Q: 3659] OnExamination 2012 - Dermatology

A 45-year-old man is referred to the dermatology clinic, with an intensely itchy, red, scaling rash which affects his scalp predominantly and is worse in spring and winter time. He also has a patch on his chest and around his beard.

On examination he has a severe scalp rash with crusting and scaling of skin.

Investigations show

Haemoglobin 13.1 g/dl (13.5-18)

White cell count $5.9 \times 10^9/L$ (4-10)

Platelets $192 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (134-143)

Potassium 4.3 mmol/l (3.5-5)

Creatinine 101 $\mu\text{mol/l}$ (60-120)

Scalp biopsy Hyperkeratosis, acanthosis and focal spongiosis

He tells you he cares most about his scalp.

Which of the following is the most appropriate first line treatment for him?

- 1- Coal tar shampoo
- 2- Ketoconazole shampoo
- 3- Oral prednisolone
- 4- Tacrolimus ointment
- 5- Topical betamethasone

Answer & Comments

Answer: 2- Ketoconazole shampoo

This man has seborrhoeic dermatitis which tends to affect hair bearing areas of skin with the scalp the worst affected.

It is thought that, at least in part, the activity of activated T cells may be enhanced by an increased reservoir of Malassezia yeasts. As such, regular washing of the hair with a ketoconazole based shampoo has been shown to reduce the severity of the condition.

Topical corticosteroids have been shown to hasten recovery, but may be associated with a rebound effect and rapid recurrence of the rash when they are withdrawn.

Coal tar shampoo and topical tacrolimus are alternate treatments.

Asteatotic dermatitis typically presents in the elderly with pruritic, xerotic, scaly skin typically over the shins but may occur over the back and hands. Tar based preparations are never used as they would aggravate the condition.



[Q: 3660] OnExamination 2012 - Dermatology

A 31-year-old woman comes to the dermatology clinic complaining that a mole on her forearm has changed shape, enlarging to nearly three quarters of a centimetre in diameter, and although it was previously homogeneous in colour, parts of it have now become a very dark black.

She has no significant past medical history but admits to significant use of tanning beds and having spent a few years living in California.

Investigations show:

Haemoglobin 13.0 g/dl(13.5-18)

White cell count $5.4 \times 10^9/L$ (4-10)

Platelets $200 \times 10^9/L$ (150-400)

ESR 11 mm/hr(1-20)

Sodium 139 mmol/l (134-143)

Potassium 4.2 mmol/l (3.5-5)

Creatinine 110 $\mu\text{mol/l}$ (60-120)

Excision biopsy: 5 mm thick lesion, no ulceration.

Which of the following features is most associated with a poor prognosis in this patient?

- 1- Depth of the melanoma lesion
- 2- Female sex
- 3- Her age
- 4- Lack of ulceration
- 5- Significant exposure to sun beds

Answer & Comments

Answer: 1- Depth of the melanoma lesion

Survival is strongly correlated with depth of melanoma at the point of diagnosis, with lesions over 4 mm thick being associated with a particularly poor outcome.

Other predictors of a poor outcome include increasing age and male sex.

Ulceration of the lesion also implies greater risk of metastases. For lesions over 4 mm thick with ulceration, five year survival is less than 50%.



[Q: 3661] OnExamination 2012 - Dermatology

A 45-year-old teacher presents six weeks after he returns from a hiking holiday in South America with a shallow, painless ulcer of the nose.

What is the likely diagnosis?

- 1- Fusobacterium ulcerans
- 2- Leishmaniasis
- 3- Squamous cell carcinoma
- 4- Trichomoniasis
- 5- Trypanosomiasis

Answer & Comments

Answer: 2- Leishmaniasis

The likely diagnosis, given the history, is cutaneous leishmaniasis. Lesion pain and pruritis may be present in cutaneous leishmaniasis, but are not typical.

Diagnosis is by histologic section with staining for amastigotes. *Leishmania braziliensis* is the likely pathogen which is spread by sandfly bites in endemic areas.

Fusobacteria cause the tropical ulcer, an intensely painful, shallow ulcer.



[Q: 3662] OnExamination 2012 - Dermatology

A 41-year-old female presents with a six month history of a pruritic vesicular-papular rash on the elbows, knees and buttocks associated with numerous blistering eruptions and excoriations.

Her GP has prescribed topical steroid therapy but this has not helped.

What is the most likely diagnosis?

- 1- Atopic eczema (dermatitis)
- 2- Dermatitis herpetiformis (DH)
- 3- Lichen planus
- 4- Psoriasis
- 5- Scabies

Answer & Comments

Answer: 2- Dermatitis herpetiformis (DH)

This patient presents with pruritic vesicles on her elbows, knees and buttocks which have not responded to topical steroids. This is the classical presentation of DH.

Atopic dermatitis usually is flexural and responds to topical steroids.

Henoch-Schönlein purpura is a form of vasculitis.

In scabies there are burrows and in psoriasis the rash consists of plaques with silvery scales.



[Q: 3663] OnExamination 2012 - Dermatology

A 24-year-old female attends clinic complaining of numerous depigmented areas on the arms and legs.

Which of the following diseases is most likely to accompany this skin condition?

- 1- Addison's disease
- 2- Hypoparathyroidism
- 3- Pernicious anaemia
- 4- Systemic lupus erythematosus
- 5- Tuberous sclerosis

Answer & Comments

Answer: 3- Pernicious anaemia

The suggested diagnosis is vitiligo which is associated with numerous autoimmune conditions including, in order of frequency:

Autoimmune hypothyroidism

Pernicious anaemia

Alopecia areata

Addison's disease.

It is associated with both type 1 and 2 autoimmune polyendocrine syndromes but these are much rarer than the former diagnoses.



[Q: 3664] OnExamination 2012 - Dermatology

A 55-year-old woman presents with a non-pruritic rash that had developed over the last two months. Examination revealed several, circular, erythematous, raised, smooth-surfaced lesions of variable size from 1-5 cm in diameter on the elbows, extensor aspects of the forearms and knuckles.

What is the most likely diagnosis?

- 1- Eczema
- 2- Granuloma annulare
- 3- Psoriasis
- 4- Tinea corporis
- 5- Urticaria

Answer & Comments

Answer: 2- Granuloma annulare

The history of non-itchy, circular, raised, smooth-surfaced lesions on the elbows, extensor aspects of the forearms and knuckles and the raised borders are suggestive of granuloma annulare.

Discoid eczema tends to be scaly and pruritic in nature.

Psoriasis typically has a silvery scale and can be pruritic.

Urticaria lasts a few hours and is pruritic.

Tinea corporis is a fungal infection and is typically scaly and pruritic in nature.

The most likely answer is therefore granuloma annulare. This can be associated with diabetes.



[Q: 3665] OnExamination 2012 - Dermatology

A 68-year-old woman presents with a two month history of a widespread pruritic rash.

Examination reveals widespread erythema with several small blisters containing straw-coloured fluid and one or two larger serosanguineous blisters.

What is the most likely diagnosis?

- 1- Bullous impetigo
- 2- Bullous pemphigoid
- 3- Insect bite
- 4- Scabies

- 5- Urticarial vasculitis

Answer & Comments

Answer: 2- Bullous pemphigoid

Pemphigoid, erythema multiforme and herpes are the commonest causes of a blistering rash.

The history above is a classic description of bullous pemphigoid (BP).

Immunoglobulin (Ig)G autoantibodies bind to the skin basement membrane in patients with BP. The binding of antibodies at the basement membrane activates complement and inflammatory mediators.

Activation of the complement system is thought to play a critical role in attracting inflammatory cells to the basement membrane. These inflammatory cells are postulated to release proteases, which degrade hemidesmosomal proteins and lead to blister formation.

Eosinophils are characteristically present in blisters as demonstrated by histopathologic analysis, although their presence is not an absolute diagnostic criterion.



[Q: 3666] OnExamination 2012 - Dermatology

Which statement regarding tinea capitis is correct?

- 1- It causes patches that fluoresce dull green under Wood's lamp
- 2- It is effectively treated with topical nystatin ointment
- 3- It is most commonly caused by the fungus Trichophyton tonsurans
- 4- It often results in permanent alopecia
- 5- Its presence should suggest immunological deficiency

Answer & Comments

Answer: 3- It is most commonly caused by the fungus *Trichophyton tonsurans*

Tinea capitis is a dermatophyte infection of the scalp. There are a number of causative organisms, but currently in the UK and USA is most often caused by *Trichophyton tonsurans*, and occasionally by *Microsporum canis*. It is commonest in areas of socio-economic deprivation.

There is initially a small papule at the base of the hair follicle which spreads peripherally forming a scaly circular plaque (ringworm) within which there are brittle, broken infected hairs (exclamation mark hairs).

Confluent patches of alopecia develop and there may be pruritis. Sometimes a severe inflammatory response produces an elevated boggy granulomatous mass (kerion), studded with sterile pustules. There may be fever and regional lymphadenopathy, and occasionally permanent scarring and alopecia may result.

The crusted patches fluoresce dull green under Wood's light if caused by *Microsporum canis*, but do not fluoresce if caused by *Trichophyton tonsurans*. Microscopic examination of a potassium hydroxide (KOH) preparation shows tiny spores and the fungi may be grown in Sabouraud medium with antibiotics.

Oral griseofulvin for two to three months is required, or ketoconazole for resistant cases.



[Q: 3667] OnExamination 2012 - Dermatology

Which of the following concerning leg ulcers is correct?

- 1- Diuretics have been shown to improve ulcer healing when associated with oedema
- 2- In diabetic ulcers, the dressing should be left in situ for no more than one week
- 3- Large gravitational ulcers are always painful

- 4- Treating superficial infection with antibiotics has been shown to be beneficial
- 5- Ulcers caused by arterial disease are typically treated by compression bandaging

Answer & Comments

Answer: 2- In diabetic ulcers, the dressing should be left in situ for no more than one week

Diuretics may reduce oedema but have not been demonstrated per se to reduce healing time.

Gravitational ulcers are not usually painful.

If there are no obvious features of surrounding cellulitis, antibiotic therapy is usually unnecessary and has not been shown to improve healing in superficial infection which is common in ulceration.



[Q: 3668] OnExamination 2012 - Dermatology

A 21-year-old soldier presented with an itchy rash of two weeks' duration affecting his hands, feet, groins and buttocks. The rash was typically more itchy at night. The patient gave a history of his dormitory colleagues suffering from similar complaints.

Examination revealed numerous excoriated papules and burrows primarily localised to the web spaces of hands and feet as well as the natal cleft.

What is the most likely diagnosis?

- 1- Allergic contact dermatitis
- 2- Dermatophytosis
- 3- Folliculitis
- 4- Impetigo
- 5- Scabies

Answer & Comments

Answer: 5- Scabies

Scabies is common in children and young adults, occurring more commonly in places where crowding facilitates transmission of the mite. The rash causes itching more during the nights when the patient is warmer. Areas of skin scarce in pilosebaceous follicles are the preferred site by the scabies mite.

Option A: Allergic contact dermatitis will present with itchy papulo-vesicular eruption at the site of contact of the allergen.

Option B: Dermatophytosis usually presents with annular scaly plaques with active peripheral margins and central clearing. The lesions are typically itchy and increase in number over a period of time.

Option C: Folliculitis presents with erythematous follicular papules and pustules.

Option D: Impetigo is a superficial infection of the skin common in children. It classically involves the epidermis and presents with honey coloured crusts. It is contagious and spreads among contacts as well as by autoinoculation.



[Q: 3669] OnExamination 2012 - Dermatology

A 43-year-old woman with atopic dermatitis (atopic eczema) presented with an acute generalised exacerbation of her disease.

She was admitted to hospital but failed to improve with emollients, topical betamethasone 17-valerate and oral antihistamine.

Which one of the following drugs is the most appropriate treatment?

- 1- Acitretin
- 2- Amoxicillin
- 3- Colchicine
- 4- Cyclosporin
- 5- Dapsone

Answer & Comments

Answer: 4- Cyclosporin

Cyclosporin is a well used drug in the treatment of atopic dermatitis (AD). It is usually at doses of 2-5 mg/kg.

The pathophysiology of AD is complex but the T lymphocytes are involved and it is known that there is an increased production of cytokines particularly IL-4.

Cyclosporin is a suppressor of T cells and in that respect works very well in atopic dermatitis and psoriasis. The side effects of hypertension and renal toxicity limit its use.

These patients are seen monthly to have their blood pressure and urea and electrolytes checked.



[Q: 3670] OnExamination 2012 - Dermatology

An elderly patient presented with an acute onset painful rash (above) on the face.

What is the most likely diagnosis?

- 1- Allergic contact dermatitis
- 2- Atopic dermatitis
- 3- Erythema multiforme
- 4- Herpes zoster
- 5- Irritant contact dermatitis

Answer & Comments

Answer: 4- Herpes zoster

Herpes zoster presents with grouped vesicobullous lesions in a dermatomal distribution.

Option A: Allergic contact dermatitis may present with an acute eczematous reaction at the site of contact with the allergen after a period of sensitisation.

Option B: Atopic dermatitis may present in the acute phase with an acute eczematous

reaction on the face in infants. In adults the flexures are involved.

Option C: Erythema multiforme classically presents with target lesions with a central bullous lesion surrounded by an erythematous halo following the intake of an offending drug.

Option E: Irritant contact dermatitis presents with an acute eczematous reaction with erythema, vesiculation, crusting and itching or a burning sensation at the site of the contact of the allergen. A sensitisation dose is not required as in allergic contact dermatitis.



[Q: 3671] OnExamination 2012 - Dermatology

A middle aged male with diabetes presented with a tender lesion (as shown) over his buttock of two days' duration.

What is the most likely diagnosis?

- 1- Carbuncle
- 2- Ecthyma
- 3- Folliculitis
- 4- Impetigo
- 5- Sycosis

Answer & Comments

Answer: 1- Carbuncle

Option B: Ecthyma usually follows trivial trauma such as a scratch or insect bite on the legs and develops into a small pustular lesion on an erythematous base, with an adherent hard crust of dried exudate below which ulceration exists.

Option C: Folliculitis presents with erythematous painful follicular pustules.

Option D: Superficial infection of the skin caused by *Staphylococcus aureus* and *Streptococcus pyogenes* is common in children. Impetigo classically involves the epidermis and presents with honey coloured

crusts. It is contagious and spreads among contacts as well as by autoinoculation.

Option E: Sycosis barbae presents clinically with inflammatory folliculo-centric pustules commonly on the glabrous areas of the skin.



[Q: 3672] OnExamination 2012 - Dermatology

A 3-month-old infant presented to the dermatologist with a red lesion over the left side of the face. It was flat initially at birth and had progressively become elevated and boggy.

What is the most likely diagnosis?

- 1- Aplasia cutis
- 2- Cystic hygroma
- 3- Haemangioma
- 4- Squamous cell carcinoma
- 5- Lymphangioma

Answer & Comments

Answer: 3- Haemangioma

Option A: Aplasia cutis presents with congenital absence of skin.

Option B: Cystic hygroma is a congenital multiloculated lymphatic lesion that is classically found in the left posterior triangle of the neck. This is the most common form of lymphangioma which typically transilluminates and is bluish in colour.

Option D: Squamous cell carcinoma most commonly presents in the middle aged and elderly as keratotic plaques in the sun exposed areas.

Option E: Lymphangioma of the head and neck region involves swelling or mass that is soft to palpation and well circumscribed or diffuse. It may be well to ill-defined and is often associated with a bluish discoloration. See cystic hygroma above.



[Q: 3673] OnExamination 2012 - Dermatology

A 5-year-old boy was brought with pigmentation around his mouth and oral mucosa of six months duration.

What is the most likely diagnosis?

- 1- Condylomata lata
- 2- Congenital melanocytic naevus
- 3- Freckles
- 4- Mucosal lichen planus
- 5- Peutz-Jegher's syndrome

Answer & Comments

Answer: 5- Peutz-Jegher's syndrome

Option A: Condylomata lata - in secondary syphilis, condylomata

lata appear as flat-topped warty papules, affecting the mucosa. Oral mucosa are rarely affected.

Option B: Congenital melanocytic naevus presents with naevi of varying sizes at birth.

Option C: Freckles present as brownish macules on sun exposed sites and do not affect the mucosa.

Option D: Mucosal lichen planus commonly presents as bilateral, white lesions in the buccal and lingual mucosa. They may be reticular, papular or plaque-like or may have a violaceous hue.

Mucocutaneous pigmentation and hyperpigmented macules typically occur in Peutz-Jeghers syndrome. They appear as small brown or dark blue spots as lentigenes, most commonly in the peribuccal area and buccal mucosa. The pigmentation in perioral region often crosses the vermillion border and can extend to the perinasal area too. Peutz Jeghers syndrome is associated with gastrointestinal polyposis.



[Q: 3674] OnExamination 2012 - Dermatology

A 1-month-old otherwise healthy baby presented with a rash on the scalp with greasy scaling.

What is the most likely diagnosis?

- 1- Allergic contact dermatitis
- 2- Cradle cap
- 3- Folliculitis
- 4- Impetigo
- 5- Tinea capitis

Answer & Comments

Answer: 2- Cradle cap

Option A: Allergic contact dermatitis will present with itchy papulovesicular eruption at the site of contact of the allergen.

Option C: Folliculitis presents with obvious follicular involvement in a case of painful papulopustular lesions. It is commoner in glabrous areas of the skin.

Option D: Impetigo, a superficial infection of the skin caused by Staphylococcus aureus and Streptococcus pyogenes is common in children. Impetigo classically involves the epidermis and presents with honey coloured crusts.

Option E: Tinea capitis or ringworm of the scalp is a common condition affecting children and uncommonly adults. The appearance varies from a few dull grey, broken-off hairs with a little scaling, detectable only on careful inspection, to a severe, painful, inflammatory mass covering most of the scalp. Itching is variable.



[Q: 3675] OnExamination 2012 - Dermatology

An HIV positive male presented with whitish discolouration of tongue and oral mucosa.

What is the most likely diagnosis?

- 1- Aphthous stomatitis
- 2- Geographical tongue
- 3- Herpetic gingivostomatitis
- 4- Mucosal candidiasis
- 5- Mucosal lichen planus

Answer & Comments

Answer: 4- Mucosal candidiasis

Option A: Aphthous stomatitis is also common in HIV positive and manifests with recurrent ulceration of the oral mucosa.

Option B: Geographical tongue manifests as apparent bald areas of the tongue.

Option C: Herpetic gingivostomatitis presents as painful erosions of the oral mucosa and gingiva.

Option E: Mucosal lichen planus may present with white to violaceous macules and plaques over the oral mucosa. The lesions cannot be scraped off.



[Q: 3676] OnExamination 2012 - Dermatology

A young male athlete presented with multiple itchy scaly lesions over his legs and thighs. Historically he had had similar lesions in the past which had been treated with unspecified local medications.

On examination he was found to have multiple erythematous scaly plaques with a raised peripheral margin, a clear centre with hyper-pigmentation.

What is the most likely diagnosis?

- 1- Allergic contact dermatitis
- 2- Fixed drug eruption
- 3- Psoriasis
- 4- Sarcoidosis
- 5- Tinea corporis

Answer & Comments

Answer: 5- Tinea corporis

Dermatophytosis is common in athletes. It usually presents with annular scaly plaques with active peripheral margins and central clearing resulting in increasing size of the lesions. The lesions are typically itchy and increase in number over a period of time. The affliction on legs and thighs is termed tinea corporis. It is occupational dermatoses in athletes and may be recurrent in them if due precautions are not taken.

Option A: Allergic contact dermatitis will present with itchy papulo-vesicular eruption at the site of contact of the allergen.

Option B: Fixed drug eruption presents with erythematous or hyperpigmented macules or patches, sometimes with central bullae. History of drug intake may be forthcoming and a history of recurrent such episodes at the same site may be present.

Option C: Psoriasis presents with papulosquamous lesions with micaceous scaling. Annular lesions may be present. Itching is not a feature.

Option D: Sarcoidosis may present with scaly plaques, however features of peripheral activity and central clearing are usually not seen and itching is not a feature.



[Q: 3677] OnExamination 2012 - Dermatology

A 20-year-old male presents with a very itchy rash afflicting both groins and suprapubic region of four weeks duration. On examination he had multiple annular scaly plaques with spreading peripheral borders and central clearing.

What is his diagnosis?

- 1- Allergic contact dermatitis
- 2- Dermatophytosis
- 3- Fixed drug eruption

- 4- Psoriasis
5- Sarcoidosis

Answer & Comments

Answer: 2- Dermatophytosis

Dermatophytosis is common in young active adults. It usually presents with annular scaly plaques with active peripheral margins and central clearing resulting in increasing size of the lesions. The lesions are typically itchy and increase in number over a period of time. The affliction of groins is referred to as 'tinea cruris' and involvement of limbs and trunk as 'tinea corporis'. Such patients can also be said to be suffering from 'tinea cruris et corporis'.

Option A: Allergic contact dermatitis will present with itchy papulo-vesicular eruption at the site of contact of the allergen

Option C: Fixed drug eruption present with erythematous or hyperpigmented macules or patches, sometimes with central bullae. History of drug intake may be forthcoming and history of recurrent such episodes at the same site may be present.

Option D: Psoriasis presents with papulosquamous lesions with micaceous scaling. Annular lesions may be present. Itching is not usually a prominent feature.

Option E: Sarcoidosis may present with scaly plaques, however features of peripheral activity and central clearing are usually not seen and itching is not a feature.



[Q: 3678] OnExamination 2012 - Dermatology

A 33-year-old female attends her GP concerned regarding a mole.

Which of the following characteristics of the lesion would raise suspicion that it is a malignant melanoma?

- 1- Lesion has irregular edge
2- Lesion is 5 mm in diameter

- 3- Lesion is pigmented uniformly
4- Lesion is present on face
5- Lesion is smoothly raised

Answer & Comments

Answer: 1- Lesion has irregular edge

The mnemonic of ABCDE regarding characteristics of a melanoma are as follows:

A - Asymmetry - one half of the lesion does not match the other half

B - Border irregularity

C - Colour variegation - pigmentation is not uniform

D - Diameter- a diameter 7 mm warrants investigation although changes in size are also important

E - Evolution - evolving size or changes in characteristics such as nodules.

Read article

Neonatal long lines: localisation with colour Doppler ultrasonography -- Groves et al. 90 (1): F5 -- ADC - Fetal and Neonatal Edition

Read article

A colour handbook of dermatology -- MATHEWS 76 (893): 191 -- Postgraduate Medical Journal

Read article

Colour Doppler imaging in Takayasu's arteritis -- ESCANO et al. 82 (9): 1090 -- British Journal of Ophthalmology



[Q: 3679] OnExamination 2012 - Dermatology

Which of the following determines the primary mechanical properties of skin?

- 1- Dermis
2- Stratum basale

- 3- Stratum corneum
- 4- Stratum granulosum
- 5- Subcutaneous tissue

Answer & Comments

Answer: 3- Stratum corneum

The stratum corneum is the last layer and provides a mechanical barrier to the skin and therefore determines the mechanical functions of the skin. The hands and feet have thick stratum corneum as compared to the lips and eyelids. The thicker the stratum corneum is the more protection there is for the skin.

The dermis also has some factor to play with its elastic fibres and fibrous tissue.

The rest of the layers are also important but the mechanical properties are primarily determined by the stratum corneum.



[Q: 3680] OnExamination 2012 - Dermatology

A 25-year-old female presents with concerns regarding the unsightly appearance of her toe nails.

They have a whitish discolouration extending up the nail bed in a number of the toes of both feet. They are entirely painless and she is otherwise well.

What is the most appropriate treatment?

- 1- Oral fluconazole
- 2- Oral terbinafine
- 3- Topical benzoic acid
- 4- Topical fluconazole
- 5- Topical terbinafine

Answer & Comments

Answer: 2- Oral terbinafine

This young woman has typical features of fungal nail infection - onychomycosis - and the most appropriate treatment is oral antifungals

as topical antifungals may be effective for one or two nails but not where there are a number affected.



[Q: 3681] OnExamination 2012 - Dermatology

A 22-year-old female is referred with symmetrical, depigmented areas on the arms and legs but has been otherwise quite well.

Which one of the following diseases is most likely to be associated with her skin disease?

- 1- Diabetes mellitus
- 2- Hyperparathyroidism
- 3- Pernicious anaemia
- 4- Scleroderma
- 5- Systemic lupus erythematosus (SLE)

Answer & Comments

Answer: 3- Pernicious anaemia

This lady has vitiligo, which has a number of disease associations. It is the most common depigmenting disorder, and affects 0.5% of the world population. Half present before the age of 20, and there is no difference in rate between sexes, skin type or race. There seems to be a genetic basis to the disease, and familial clustering is seen.

The majority of diseases associated with vitiligo are autoimmune. Thyroid disease (particularly Hashimoto thyroiditis and Graves disease) is one of the strongest associations, and is often screened for in patients with vitiligo. HLA-B13 appears to be the link between thyroid disease and vitiligo.

9% of patients with pernicious anaemia have been shown to have vitiligo, compared to 5.7% with diabetes mellitus.

Other associations are Addison's disease, alopecia areata, rheumatoid arthritis, inflammatory bowel disease and psoriasis.

In addition, vitiligo may be a manifestation of polyglandular autoimmune syndrome, which includes HYPOparathyroidism rather than hyperparathyroidism.

SLE can cause a post-inflammatory hypopigmentation, but neither it or scleroderma have a recognised association with vitiligo.



[Q: 3682] OnExamination 2012 - Dermatology

A 17-year-old pregnant female attends antenatal clinic and is noted to have scattered small, raised lesions on her trunk and axillary freckles.

She was not aware of any of her family members having these lesions.

What is the likely mode of inheritance of this condition?

- 1- Autosomal dominant
- 2- Autosomal recessive
- 3- Trinucleotide repeating
- 4- X linked dominant
- 5- X linked recessive

Answer & Comments

Answer: 1- Autosomal dominant

This patient has neurofibromatosis with axillary freckling and neurofibromas.

This is usually inherited as autosomal dominant, although it may arise from a sporadic new mutation of the NF1 gene.



[Q: 3683] OnExamination 2012 - Dermatology

A 33-year-old female is admitted with erythema multiforme (EM) and erythematous lesions of the mouth and eyes.

Which one of the following drugs may account for her presentation?

- 1- Diazepam
- 2- Fluoxetine
- 3- Mebeverine
- 4- Oral contraceptive
- 5- Sulfasalazine

Answer & Comments

Answer: 5- Sulfasalazine

Any drug or infection can trigger EM but sulfasalazine and sulfa-group drugs are well reported as causes of EM and Stevens-Johnson syndrome.



[Q: 3684] OnExamination 2012 - Dermatology

A 36-year-old female presents with raised erythematous tender lesions on both legs which have developed since she had a throat infection two weeks ago.

Which one of the following investigations is most likely to establish the diagnosis?

- 1- Anti-streptolysin-O titre (ASOT)
- 2- Chest x ray
- 3- Mantoux test
- 4- Throat swab cultured for bacteria
- 5- Throat swab cultured for viruses

Answer & Comments

Answer: 1- Anti-streptolysin-O titre (ASOT)

This lady presents with tender lesions two weeks after a sore throat.

This is most likely to be post-streptococcal erythema nodosum and ASOT is most likely to confirm this.



[Q: 3685] OnExamination 2012 - Dermatology

Which of the following statements regarding psoriasis is most true?

- 1- Ciclosporin is ineffective in the treatment of psoriasis
- 2- Diagnosis requires histological confirmation
- 3- Guttate psoriasis often arises after staphylococcal infection
- 4- T cells play a prominent role in the pathogenesis of psoriasis
- 5- Twin studies have identified no genetic basis for psoriasis

Answer & Comments

Answer: 4- T cells play a prominent role in the pathogenesis of psoriasis

Diagnosis of psoriasis is based on clinical observation of sharply demarcated, erythematous, scaling plaques, and rarely requires biopsy.

Streptococcal infection is associated with precipitation and recurrence of guttate psoriasis.

Ciclosporin is a major inhibitor of T cell activation, and, given that T cells are central to the pathogenesis of psoriasis, is very effective treatment in psoriasis.

Genetic studies have led most experts to believe that psoriasis is the result of multiple genetic factors interacting with environmental stimuli. Genetic factors also seem to contribute to the clinical manifestations of the disease, for example, age of onset and severity of disease.



[Q: 3686] OnExamination 2012 - Dermatology

A 20-year-old male presents with extensive, coalescing, hypopigmented, slightly scaly lesions on his back and chest.

The rash had been present for two years and had gradually become more extensive. He had otherwise been in good health. The lesions were not symptomatic but he was concerned about their appearance.

What is the most appropriate treatment for his condition?

- 1- Aciclovir cream
- 2- Ketoconazole cream
- 3- Nystatin cream
- 4- Oral itraconazole
- 5- Oral terbinafine

Answer & Comments

Answer: 2- Ketoconazole cream

The patient presents with an asymptomatic eruption on his trunk. The lesions are scaly, hypopigmented and are not associated with any systemic disease. This is characteristic of pityriasis versicolor, which is caused by the unicellular yeast *Pityrosporum ovale* and *Pityrosporum orbiculare*. The yeast is lipophilic and is encouraged by an increase in environmental temperature, thus many patients notice that the condition begins after a summer vacation.

It is a disorder of the healthy, but the immunocompromised are at risk.

The condition is asymptomatic and appears pale in comparison to the normal skin. The fungus affects the melanocytes hence the hypo-pigmentation.

The treatment options include topical imidazole creams, selenium sulphide shampoo and, if not responding to topical treatment, oral itraconazole 200 mg once a day for seven days.

In this patient the topical treatment should be tried first.



[Q: 3687] OnExamination 2012 - Dermatology

A previously fit 30-year-old female presents with a four day history of intractable pruritus and urticaria.

What is the most appropriate initial management?

- 1- Chlorpheniramine
- 2- Prednisolone
- 3- Ranitidine
- 4- Topical hydrocortisone
- 5- Topical mepyramine

Answer & Comments

Answer: 1- Chlorpheniramine

Urticaria is a common condition and usually responds very well to systemic antihistamines which are the correct first line treatment.

Oral steroids can be given for severe cases but only as a last resort.

Topical steroids/topical antihistamines have no effect.



[Q: 3688] OnExamination 2012 - Dermatology

A 26-year-old man is noted to have cyanosis of the lower limbs and clubbing of the toes but not the fingers.

Which of the following statements is true?

- 1- He has coarctation of the aorta
- 2- He has Eisenmenger's syndrome
- 3- He has had a Blalock shunt operation
- 4- He is likely to have a loud continuous 'machinery' murmur below the left clavicle
- 5- He is likely to need urgent surgery

Answer & Comments

Answer: 2- He has Eisenmenger's syndrome

This is the differential cyanosis of a reversed patent ductus arteriosus (PDA). There is a right-left shunt from the pulmonary artery to the aorta just distal to the left subclavian artery.

Coarctation causes radiofemoral delay. It may be associated with PDA but there is no suggestion in this patient.

Continuous machinery murmur is the classic murmur of PDA but when the shunt reverses (as in patients with a large PDA and/or pulmonary disease) the murmur becomes softer and shorter.

When Eisenmenger's syndrome has developed surgery is associated with a very high mortality.

A Blalock shunt (anastomosis of subclavian artery to pulmonary artery) used to be performed for Fallot's tetralogy and leads to a weak left radial pulse.



[Q: 3689] OnExamination 2012 - Dermatology

A 40-year-old man presented with pityriasis versicolor.

What is the most appropriate treatment?

- 1- Methotrexate
- 2- Oral terbinafine
- 3- Phototherapy with ultraviolet light (UVB)
- 4- Psoralen with ultraviolet light (PUVA) therapy
- 5- Topical selenium sulphide

Answer & Comments

Answer: 5- Topical selenium sulphide

Pityriasis versicolor (also called tinea versicolor) is a skin lesion caused by a fungus called *Malassezia furfur*.

The treatment is topical selenium sulphide.

Oral itraconazole is also effective.



[Q: 3690] OnExamination 2012 - Dermatology

A 17-year-old girl presents with a two week history of urticaria.

Over the last couple of days she has been aware of new lesions occurring on a daily basis.

Which one of the following statements is most likely to be correct?

- 1- She is likely to have an associated asthma
- 2- She is likely to have taken penicillin recently
- 3- She is unlikely to have any identifiable trigger factor
- 4- The lesions will be present for at least 24 hours
- 5- There is likely to be a nut allergy

Answer & Comments

Answer: 3- She is unlikely to have any identifiable trigger factor

The commonest form of urticaria is idiopathic and there is no identifiable trigger.

Peanut allergy and penicillin may cause urticarial rashes but there is usually an associated specific history of contact with the allergen.

Urticarial lesions last less than 24 hours usually.



[Q: 3691] OnExamination 2012 - Dermatology

A 23-year-old female presents with a problem with her nails.

Over the last two months they have become rather unsightly and brittle. She has taken a selection of medications for acne.

Examination reveals onycholysis.

Which of the following preparations may be responsible for the onycholysis?

- 1- Dianette
- 2- Erythromycin
- 3- Isotretinoin
- 4- Tetracycline

- 5- Topical benzoic acid

Answer & Comments

Answer: 4- Tetracycline

Tetracycline is a recognised cause of onycholysis together with eczema, psoriasis and thyrotoxicosis to name but a few.



[Q: 3692] OnExamination 2012 - Dermatology

This 24-year-old woman presents with this rash for the past two weeks. She also complains of bilateral knee and ankle pains for the same duration of time.

What finding will be shown on a skin biopsy?

- 1- Fibrinoid necrosis and neutrophils within the walls of dermal capillaries
- 2- Intraepidermal clefting with eosinophils
- 3- Neutrophils within walls of medium sized arteries in the subcutis
- 4- Septal panniculitis
- 5- Subepidermal bulla with eosinophils

Answer & Comments

Answer: 1- Fibrinoid necrosis and neutrophils within the walls of dermal capillaries

The photograph reveals palpable purpura in a case of Henoch-Schönlein purpura (note the symptoms of arthralgia) on both legs. Leucocytoclastic vasculitis or Hypersensitivity angitis, histopathology reveals Fibrinoid degeneration, a neutrophilic infiltrate around small blood vessels along with karyorrhexis or nuclear dust arising out of disintegration of neutrophils.

Option B: This histological pattern is consistent with intraepidermal blistering conditions, for example, pemphigus.

Option C: This histological pattern is consistent with vasculitis affecting medium-

sized vessels, most commonly polyarteritis nodosa.

Option D: This histological pattern is consistent with erythema nodosum.

Option E: This histological pattern is consistent with subepidermal blistering disorders, for example, bullous pemphigoid.



[Q: 3693] OnExamination 2012 - Dermatology

A 35-year-old man has just been diagnosed with dermatitis herpetiformis.

Besides starting on a gluten-free diet, his dermatologist has decided to start him on oral dapsone.

What laboratory test needs to be within the normal range before commencing therapy?

- 1- Fasting glucose
- 2- Fasting lipids
- 3- Glucose-6-phosphate dehydrogenase (G6PD) levels
- 4- Haemoglobin-A1C levels (HbA1C)
- 5- Thiopurine methyltransferase (TPMT) levels

Answer & Comments

Answer: 3- Glucose-6-phosphate dehydrogenase (G6PD) levels

G6PD deficiency is an absolute contraindication to treatment with dapsone as it can lead to severe haemolytic anaemia. This is probably due to the N-hydroxy metabolites of dapsone, which are direct haemolytic agents. When allowed to build up to large enough amounts, they induce premature sequestration of the red cell in the spleen.

Options A, B and D: Abnormal HbA1C, fasting lipids and fasting glucose levels are not considered contraindications to treatment with dapsone.

Option E: TPMT levels are used to decide on starting doses of azathioprine.



[Q: 3694] OnExamination 2012 - Dermatology

This 6-month-old infant, who was born prematurely, presents with this lesion on his arm which was first noticed during the second week of life. It then progressively enlarged and deepened in colour over the next few months.

What is your most likely diagnosis?

- 1- Angiosarcoma
- 2- Lymphatic malformation
- 3- Haemangioma
- 4- Venous malformation
- 5- Kasabach-Merritt syndrome

Answer & Comments

Answer: 3- Haemangioma

Infantile haemangiomas are common vascular tumours that present in early infancy. They continue to enlarge and deepen in colour for the first few months of life before slowly involuting after six to 12 months. They are more common in premature infants.

Option A: Angiosarcomas, a high grade vascular malignancy, are very uncommon in infancy.

Option B: Lymphatic malformations are usually well formed at birth and do not have a proliferative stage like haemangiomas. They are usually skin coloured or bluish in appearance.

Option D: Venous malformations are usually well formed at birth and do not have a proliferative stage like haemangiomas. Clinically, they are usually skin coloured or have a bluish hue.

Option E: Kasabach-Merritt syndrome is seen in patients with kaposiform haemangioendothelioma, a rare vascular tumour seen in infants that present as a large,

firm, reddish-blue tumour. Patients usually have thrombocytopenia.



[Q: 3695] OnExamination 2012 - Dermatology

This 18-year-old man presents with this recurrent rash on both feet for the past two years. It worsened when football training started. He also has a history of allergic rhinitis.

What is your most likely diagnosis?

- 1- Bullous tinea pedis
- 2- Bullous pemphigoid
- 3- Erythema multiforme
- 4- Pompholyx / dyshidrotic eczema
- 5- Zoster

Answer & Comments

Answer: 4- Pompholyx / dyshidrotic eczema

Pompholyx or dyshidrotic eczema presents bilaterally on the hands and feet as itchy, erythematous blisters that resemble 'sago seeds'. It is commonly seen in young patients with a history of atopy and is more common in individuals who wear closed shoes or boots for long periods.

Option A: Bullous tinea pedis usually presents asymmetrically on one foot.

Option B: Bullous pemphigoid is very uncommon in this age group.

Option C: Erythema multiforme may present with acral blisters but are most commonly targetoid lesions. There is associated mucosal involvement.

Option E: Zoster presents as blisters in a dermatomal distribution, usually asymmetrically.



[Q: 3696] OnExamination 2012 - Dermatology

A young male presented with an itchy rash (above) on the buttocks and groins.

What is the most likely diagnosis?

- 1- Allergic contact dermatitis
- 2- Atopic dermatitis
- 3- Dermatophytosis
- 4- Irritant contact dermatitis
- 5- Scabies

Answer & Comments

Answer: 3- Dermatophytosis

Dermatophytosis is caused by a fungal infection of the skin. It presents with itchy annular plaques with a clear centre and a spreading peripheral margin. It is termed tinea corporis when it affects the trunk or extremities and tinea cruris when it affects the natal cleft or groins.

Option A: Allergic contact dermatitis may present with an acute eczematous reaction at the site of contact with the allergen after a period of sensitisation.

Option B: Atopic dermatitis may present in the acute phase with an acute eczematous reaction on the face in infants. In adults the flexures are involved.

Option D: Irritant contact dermatitis presents with an acute eczematous reaction with erythema, vesiculation, crusting and itching or a burning sensation at the site of the contact of the irritant. A sensitisation dose is not required as in allergic contact dermatitis.

Option E: Scabies presents as itchy papular eruptions and burrows in the flexures including the web spaces.



[Q: 3697] OnExamination 2012 -
Dermatology

A young male patient presented with sharply circumscribed hyperpigmented skin lesions over the back.

What is the most likely diagnosis?

- 1- Allergic contact dermatitis
- 2- Erythema multiforme
- 3- Fixed drug eruption
- 4- Folliculitis
- 5- Lichen planus

Answer & Comments

Answer: 3- Fixed drug eruption

Fixed drug eruption may present with sharply circumscribed pigmented macules, erythematous lesions or bullous lesions with a classical history of recurrence at the same site following the ingestion of the offending drug.

Option A: Allergic contact dermatitis is a form of contact dermatitis which follows contact with the offending agent such as chemicals, nickel and plants like poison ivy.

Option B: Erythema multiforme classically presents as discrete vesicular or bullous lesions surrounded by a pale area and a ring of erythema. However all three zones may not always be evident.

Option D: Folliculitis presents with painful papulopustular follicular lesions.

Option E: Lichen planus presents as violaceous polygonal papules usually around the ankles and wrists. Lichen planus pigmentosus may present in the dark skinned on the face and neck as dark to violaceous macules.



[Q: 3698] OnExamination 2012 -
Dermatology

A young otherwise healthy adolescent with multiple linear lacerations with the linear

lesions shown presented in various stages of healing with a vague history of possible antecedent causes.

What is the most likely primary diagnosis?

- 1- Contact dermatitis
- 2- Dermatitis artefacta
- 3- Hypertrophic scars
- 4- Keloids
- 5- Striae distensae

Answer & Comments

Answer: 2- Dermatitis artefacta

Option A: Contact dermatitis presents with itching, vesiculation or oozing in areas of contact with the offending allergen.

Option B (Correct answer): Dermatitis artefacta typically presents in a healthy individual with unexplained skin lesions which may be bizarre, sharply marginated geometric or linear tracks. Underlying psychiatric illness or a history of childhood neglect or abuse may be present.

Option C: Hypertrophic scars follow injuries and typically do not extend beyond the margins of the wound. As in keloids this case may present with multiple hypertrophic scars, however the primary diagnosis must be investigated.

Option D: Keloids may develop as sequelae to injuries where the overgrowth extends beyond the margins of the original injury with claw-like extensions. In this case such a patient may present with multiple keloids, however the primary diagnosis must be investigated.

Option E: Early striae may present as pinkish linear lesions of thinned skin and mature striae as white irregularly shaped bands of depressed areas of skin with their long axis parallel to lines of skin tension.



[Q: 3699] OnExamination 2012 -
Dermatology

A young adolescent girl presented with a rash in both axillary regions occurring a day after application of a new deodorant.

What is the most likely diagnosis?

- 1- Irritant contact dermatitis
- 2- Erythrasma
- 3- Herpes zoster
- 4- Intertrigo
- 5- Impetigo

Answer & Comments

Answer: 1- Irritant contact dermatitis

Option B: Erythrasma appears as reddish-brown slightly scaly patches with sharp borders. The patches occur in moist areas such as the groin, armpit, and skin folds. It is an infective condition caused by *Corynebacterium* spp.

Option C: Herpes zoster presents as grouped vesicular eruptions on an erythematous base in a dermatomal distribution.

Option D: Intertrigo is an inflammatory disorder of the skin affecting the folds commonly in the obese and diabetics and may become secondarily infected.

Option E: Impetigo commonly presents in children with painful bullous lesions with honey coloured crusts.



[Q: 3700] OnExamination 2012 -
Dermatology

A young adolescent male presented with multiple lesions on the face.

What is the most likely diagnosis?

- 1- Allergic contact dermatitis
- 2- Comedones
- 3- Nodulocystic acne

- 4- Sycosis barbae
- 5- Tinea barbae

Answer & Comments

Answer: 2- Comedones

Option A: Allergic contact dermatitis will present with itchy papulo-vesicular eruption at the site of contact of the allergen.

Option C: Nodulocystic acne presents with multiple inflammatory lesions over the face.

Option D: Sycosis barbae presents clinically with inflammatory folliculocentric pustules.

Option E: Tinea barbae presents with itchy follicular lesions and annular plaques on glabrous areas of the face.



[Q: 3701] OnExamination 2012 -
Dermatology

A 15-year-old boy was treated with permethrin cream for scabies infestation.

On follow-up three weeks later he was found to have continuing infestation.

What is the most likely reason for this?

- 1- Facial skin was not treated
- 2- Non-disposal of underwear
- 3- Other household members were not treated
- 4- The organism is resistant to permethrin
- 5- The treatment was not repeated as prescribed

Answer & Comments

Answer: 3- Other household members were not treated

Scabies is an intensely pruritic and highly contagious infestation of the skin acquired through close personal contact.

A delayed type IV hypersensitivity reaction to the mites, their eggs, or excreta occurs

approximately 30 days after infestation and is responsible for the intense pruritus that is the hallmark of the disease.

All household members and close personal contacts should be treated whether or not they are symptomatic and patients should be re-examined two weeks after treatment to evaluate effectiveness.

Treatment failures are uncommon. Recurrence of the eruption usually means re-infection has occurred.



[Q: 3702] OnExamination 2012 - Dermatology

A young adolescent male presents with dystrophic nails, with debris on the under surface of the nails and elevated distal end of nail plate.

He also had scaly plaques on his elbows and knees.

What is the most likely diagnosis?

- 1- Alopecia areata associated nail dystrophy
- 2- Irritant contact dermatitis
- 3- Onychomycosis
- 4- Psoriasis
- 5- Trachyonychia

Answer & Comments

Answer: 4- Psoriasis

Option A: Alopecia areata produces fine nail pits in parallel rows in a 'tram track appearance'.

Option B: Chronic irritant dermatitis of the hands present with inflammation of the skin typically manifested by erythema, mild oedema, and scaling in the periungual region with nail plate discolouration affecting multiple fingers and thumbs.

Option C: Onychomycosis causes nail dystrophy resulting in the moth eaten

appearance. Tinea corporis usually causes annular scaly plaques which are itchy.

Option E: Trachyonychia or 20-nail-dystrophy may be seen in lichen planus or alopecia areata.



[Q: 3703] OnExamination 2012 - Dermatology

A 60-year-old male presents with a sudden onset eruption of blisters. He gives a history of pain in the affected area a day prior to the eruption of the blisters for which he applied a topical analgesic.

What is the most likely diagnosis?

- 1- Allergic contact dermatitis
- 2- Folliculitis
- 3- Herpes zoster
- 4- Irritant contact dermatitis
- 5- Paederus dermatitis

Answer & Comments

Answer: 3- Herpes zoster

Option A: Allergic contact dermatitis presents with itchy papulo-vesicular eruption at the site of contact of the allergen.

Option B: Folliculitis presents with painful papulopustular follicular lesions.

Option D: Irritant contact dermatitis presents with vesicular eruption at sites of contact with the irritant, often on the exposed areas such as extremities. A burning sensation is experienced in irritant contact dermatitis as opposed to the itching in allergic contact dermatitis.

Option E: Paederus dermatitis is an acute irritant contact dermatitis which presents as plaques, linear streaks or 'kissing' lesions at sites where the offending pederin from the crushed beetle comes into contact with the skin.



[Q: 3704] OnExamination 2012 -
Dermatology

A mother brought her three children aged less than 10 years, all with the complaints of a rash around mouth and nose of 10 days duration.

The youngest child was affected first following which the other two children were affected. The lesions have been rapidly spreading in the affected area. Examination revealed 1-3 cms crusted erosions with golden yellow crusts around the lips and nares in all three children. The youngest child also had similar lesions on his hands.

What is the most likely diagnosis?

- 1- Ecthyma
- 2- Herpes simplex
- 3- Impetigo
- 4- Perioral dermatitis
- 5- Warts

Answer & Comments

Answer: 3- Impetigo

Option A: Ecthyma usually follows trivial trauma such as a scratch or insect bite on the legs and develops into a small pustular lesion on an erythematous base, with an adherent hard crust of dried exudate below which ulceration exists.

Option B: Herpes simplex infection presents with recurrent grouped vesicular eruptions on an erythematous base at mucocutaneous junctions.

Option D: Perioral dermatitis presents usually in women as vesicopustules around the mouth and rarely around the eyes, nose, or forehead. The rash appears very similar to acne.

Option E: Warts present with verrucous plaques and papules more commonly over extremities.



[Q: 3705] OnExamination 2012 -
Dermatology

A 40-year-old male presented with progressive discolouration of his great toe nail, which initially affected the distal part of the nail plate and progressively involved the more proximal parts of the same nail over a period of three months.

He also noticed a rash in the groins which had appeared approximately four weeks back.

Examination revealed a moth-eaten appearance of the right great toe nail with a scaly annular rash with an active peripheral margin in both groins.

What is the most likely diagnosis?

- 1- Allergic contact dermatitis
- 2- Fixed drug eruption
- 3- Onychomycosis with tinea cruris
- 4- Psoriasis
- 5- Reiter's disease

Answer & Comments

Answer: 3- Onychomycosis with tinea cruris

Onychomycosis is not uncommon in males. It typically affects the distal part of the nail plate with progressive involvement of the proximal portions of the nail. The great toe may be the only affected nail, although it is not uncommon to find other toe nails also affected over a period of time.

The affliction of the great toe may be long standing and asymptomatic except for the disfigurement of the nail plate. The patient frequently consults the doctor when he or she develops other symptoms of dermatophytosis as a result of spread of the infection commonly by auto inoculation in areas such as the groins, trunk, extremities or the scalp.

Option A: Allergic contact dermatitis will present with itchy papulo-vesicular eruption at the site of contact of the allergen.

Option B: Fixed drug eruptions present with macules, erythematous or hyperpigmented or bullous lesions. History of drug intake may be forthcoming. Onset is sudden with rapid progression. Lesions are uncommonly scaly plaques which will not show typical peripheral activity of dermatophytosis.

Option D: Psoriasis presents with papulosquamous lesions with micaceous scaling. Annular lesions may be present. Itching is not a feature.

Option E: Reiter's disease typically presents with papulosquamous plaques, keratoderma blennorrhagica and circinate balanitis which are not itchy.



[Q: 3706] OnExamination 2012 - Dermatology

A father, 48-year-old, and his son, 20-year-old, presented with multiple itchy red lesions over their trunks and groins.

The son had developed the rash initially after working out in the local gym following which his father noticed a similar rash afflicting him.

What is the most likely diagnosis?

- 1- Allergic contact dermatitis
- 2- Fixed drug eruption
- 3- Psoriasis
- 4- Sarcoidosis
- 5- Tinea corporis

Answer & Comments

Answer: 5- Tinea corporis

Dermatophytosis is common in young adults. It usually presents with annular scaly plaques with active peripheral margins and central clearing resulting in increasing size of the lesions. The lesions are typically itchy and increase in number over a period of time. The affliction of legs, thighs is termed tinea corporis. It is an occupational dermatoses in athletes and may be recurrent in them if due

precautions are not taken. The condition is contagious and can typically spread in immediate contacts such as family members if treatment is delayed or precautions are not taken.

Allergic contact dermatitis will present with itchy papulovesicular eruption at the site of contact of the allergen.

Fixed drug eruption presents with erythematous or hyperpigmented macules or patches, sometimes with central bullae. History of drug intake may be forthcoming and a history of other recurrent episodes at the same site may be present.

Psoriasis presents with papulosquamous lesions with micaceous scaling. Annular lesions may be present. Itching is not a feature.

Sarcoidosis may present with scaly plaques, however features of peripheral activity and central clearing are usually not seen and itching is not a feature.



[Q: 3707] OnExamination 2012 - Dermatology

A 38-year-old woman has erythematous plaques with hyperpigmentation at the edge and central hypopigmentation. Serological tests are unremarkable and the patient is diagnosed with discoid lupus.

Which of the following therapeutic strategies is most appropriate initially?

- 1- Cyclophosphamide
- 2- Dapsone
- 3- Methotrexate
- 4- Oral prednisolone
- 5- Sun protective measures

Answer & Comments

Answer: 5- Sun protective measures

Discoid lupus is photosensitive and so avoiding the sun with protective clothing and sunscreens, and changing behaviour is important.

Topical or intradermal steroids and hydroxychloroquine are useful therapies to prevent scarring and new lesions appearing. The latter are less effective if patients continue to smoke.

If these treatments are ineffective, second line drugs such as methotrexate, azathioprine, or thalidomide may be used.



[Q: 3708] OnExamination 2012 - Dermatology

A 51-year-old male presents with a rash that has been present intermittently over the last two years. On examination there is a symmetrical rash over the cheeks, nose and chin, with multiple papules and pustules.

What is the most appropriate therapy for this patient?

- 1- Flucloxacillin
- 2- Hydroxychloroquine
- 3- Isotretinoin
- 4- Oxytetracycline
- 5- Prednisolone

Answer & Comments

Answer: 4- Oxytetracycline

The description is that of acne rosacea particularly in view of the distribution, duration and absence of any other features. The most appropriate treatment is a tetracycline.

Isotretinoin although effective in rosacea is reserved for recalcitrant or fulminant cases.

Prednisolone is administered in rosacea fulminans.



[Q: 3709] OnExamination 2012 - Dermatology

Which of the following statements regarding psoriasis is correct?

- 1- 1% of patients have associated psoriatic arthropathy
- 2- Guttate psoriasis is the most common form of the disease
- 3- Psoriasis is more common at lower geographical altitudes
- 4- Psoriatic arthropathy precedes cutaneous lesions in roughly 20% of cases
- 5- The prevalence in the United Kingdom is 10%

Answer & Comments

Answer: 4- Psoriatic arthropathy precedes cutaneous lesions in roughly 20% of cases

The prevalence of psoriasis is reported as between 0.5 and 4.6%.

For reasons which may be explained by the filtering of ultraviolet B (UVB) light, psoriasis is more common at higher altitudes.

The commonest form of psoriasis is plaque psoriasis, making up approximately 80% of cases (guttate -10%, erythrodermic - 3%, pustular - 3%).

Studies report:

A 5-42% prevalence of psoriatic arthropathy in patients with cutaneous psoriasis and

Arthropathy precedes cutaneous lesions in 20%

Cutaneous lesions precede joint disease in 60-70% and

They occur simultaneously in 10-20%.



[Q: 3710] OnExamination 2012 -
Dermatology

A 65-year-old female who has a history of long-standing psoriasis and heavy alcohol intake, presents with a severe exacerbation of psoriasis. She was admitted and received topical therapy and over the month of her admission, her gamma-GT concentration had fallen from 400 U/L to 150 U/L (4-35).

Six weeks after discharge she was seen in outpatients where her psoriasis remained under control, but she complained of generalised hair loss.

What is the most likely cause for her hair loss?

- 1- Alopecia areata
- 2- Iron deficiency
- 3- Telogen effluvium
- 4- Thiamine deficiency
- 5- Trichotillomania

Answer & Comments

Answer: 3- Telogen effluvium

In a normal healthy person's scalp about 85% of the hair follicles are actively growing hair and 15% are resting.

If there is some shock to the system, as many as 70% of the scalp hairs can be precipitated into a resting state, thus reversing the usual ratio. Typical precipitants include illnesses, operations, accidents and childbirth.

The resting scalp hairs, now in the form of club hairs, remain firmly attached to the hair follicles at first. It is only about two months after the shock that the new hairs coming up through the scalp push out the 'dead' club hairs and increased hair fall is noticed. Thus, paradoxically, with this type of hair loss, hair fall is a sign of hair regrowth.

As the new hair first comes up through the scalp and pushes out the dead hair a fine fringe of new hair is often evident along the

forehead hairline. At first the fall of club hairs is profuse and a general thinning of the scalp hair may become evident but after several months a peak is reached and hair fall begins to lessen, gradually tapering back to normal over six to nine months.

As the hair fall tapers off the scalp thickens back up to normal, but recovery may be incomplete in some cases.



[Q: 3711] OnExamination 2012 -
Dermatology

A 38-year-old female presents with red target lesions confined to the hands and is diagnosed with erythema multiforme.

Which of the following could be the cause?

- 1- Cytomegalovirus infection
- 2- Group B streptococci
- 3- Langerhan's cells histiocytosis
- 4- Penicillin V
- 5- Ureaplasma urealyticum

Answer & Comments

Answer: 4- Penicillin V

Potential causes of erythema multiforme include:

1. Infections

Viruses: herpes simplex 1 and 2, hepatitis B, Epstein-Barr virus (EBV), enteroviruses

Small agents: Mycoplasma pneumoniae

Bacteria: Group A Streptococcus, eosin

Other: Mycobacterium tuberculosis, histoplasma, coccidioides.

2. Neoplasia

Leukaemia

Lymphoma.

3. Antibiotics

Penicillins, sulphonamides, isoniazid, tetracycline.

4. Anticonvulsants

Phenytoin, phenobarbitone, carbamazepine.

5. Other

Aspirin

Radiation therapy

Etoposide

NSAIDs

Sunlight

Pregnancy.



[Q: 3712] OnExamination 2012 - Dermatology

A 70-year-old woman complained of a rash that had developed over a month. She had otherwise been fit and well. On examination, there were numerous tense, fluid filled blisters over the trunk and limbs, but no mucosal involvement was evident.

What is the most likely diagnosis?

- 1- Dermatitis herpetiformis
- 2- Erythema multiforme
- 3- Herpes simplex
- 4- Pemphigoid
- 5- Pemphigus vulgaris

Answer & Comments

Answer: 4- Pemphigoid

The patient presents with tense blisters on her arms, trunk and legs. She is otherwise well and there is no mucosal involvement. This is typical of bullous pemphigoid.

Dermatitis herpetiformis presents with itchy excoriated areas in the elbows knees and buttocks.

Erythema multiforme presents with characteristic target lesions.

Herpes simplex is vesicular and in generalised cases the patient is likely to be unwell.

Pemphigus presents with superficial erosions and usually there is mucosal involvement.



[Q: 3713] OnExamination 2012 - Dermatology

A 30-year-old woman presents with a skin rash. On applying pressure to an unaffected area of skin it was relatively easy to induce trauma.

Increased fragility of the skin is characteristic of which of the following conditions?

- 1- Acute intermittent porphyria
- 2- Epidermolysis bullosa
- 3- Neurofibromatosis
- 4- Pseudo-xanthoma elasticum
- 5- Tuberous sclerosis

Answer & Comments

Answer: 2- Epidermolysis bullosa

Increased skin fragility is seen in a number of disorders and is used as a clinical test in bullous disorders (Nikolsky's sign).

Other causes include:

Pemphigus vulgaris

Porphyria cutanea tarda

Drug reactions (especially pseudoporphyria).

Other causes of increased skin fragility (not associated with bullae) include long term corticosteroid therapy, Ehlers-Danlos syndrome and scurvy (vitamin C deficiency).



[Q: 3714] OnExamination 2012 - Dermatology

An 18-year-old girl presents with this rash on both her upper arms and thighs for the past few years. It is generally asymptomatic.

Which of the following may be an associated skin condition?

- 1- Atopic dermatitis
- 2- Lichen planus
- 3- Nodulocystic acne
- 4- Pilonidal sinus
- 5- Psoriasis vulgaris

Answer & Comments

Answer: 1- Atopic dermatitis

This patient has keratosis pilaris, characterised by tiny, hyperkeratotic, follicular papules, most commonly affecting the upper arms and thighs. It is commonly seen in patients with atopic dermatitis.

Options B to E: There is no proven association with these other conditions.



[Q: 3715] OnExamination 2012 - Dermatology

A middle aged female patient presented with a non-itchy scaly rash on the scalp, elbows and knees.

What is the most likely diagnosis?

- 1- Allergic contact dermatitis
- 2- Atopic dermatitis
- 3- Irritant contact dermatitis
- 4- Psoriasis
- 5- Tinea capitis

Answer & Comments

Answer: 4- Psoriasis

Option A: Allergic contact dermatitis may present with an acute eczematous reaction at

the site of contact with the allergen after a period of sensitisation.

Option B: Atopic dermatitis may present in the acute phase with an acute eczematous reaction on the face in infants. In adults the flexures are involved.

Option C: Irritant contact dermatitis presents as an acute eczematous reaction at the site of contact with the irritant.

Option E: Tinea capitis presents as itchy scaly plaques on the scalp along with loss of hair, presenting as 'black-dot' alopecia.



[Q: 3716] OnExamination 2012 - Dermatology

A young farmer presented with web space infection as shown.

What is the most likely causative organism?

- 1- Candida
- 2- Dermatophytes
- 3- Pseudomonas
- 4- Staphylococcus
- 5- Streptococcus

Answer & Comments

Answer: 3- Pseudomonas

Option A: Candidal web space infection presents as soft cottony growth in the macerated web space.

Option B: Dermatophyte infection of the web space results in an itchy scaly lesion usually with affliction of the forefoot or the dorsum with an annular scaly plaque of tinea pedis.

Option D: Staphylococcus and Option E: Streptococcus infections present with painful blistering maceration of the affected web space.

Pseudomonas intertrigo typically presents with a bluish to greenish pigmentation in the affected areas. In the typical 'immersion foot'

the affected area is sodden and macerated with inhibition of the Gram positive bacteria and dermatophytes. Secondary invasion after pseudomonal infection is possible with Candida.



[Q: 3717] OnExamination 2012 - Dermatology

A 30-year-old female presented with mildly itchy violaceous papular eruptions on the dorsum of feet, ankles, wrist and low back.

What is the most likely diagnosis?

- 1- Lichen planus
- 2- Papular urticaria
- 3- Pityriasis rosea
- 4- Psoriasis
- 5- Scabies

Answer & Comments

Answer: 1- Lichen planus

Option B: Papular urticaria presents as chronic or recurrent erythematous papules caused by a hypersensitivity reaction to insect bites.

Option C: Pityriasis rosea presents as annular papulosquamous plaques with a peripheral collarette of scales.

Option D: Psoriasis presents as papulosquamous plaques over the extensors with micaceous scaling.

Option E: Scabies presents with itchy papules and burrows in flexors and web spaces of the hands and feet.



[Q: 3718] OnExamination 2012 - Dermatology

A young female patient presented with the above rash of few hours duration after tending her garden. She had a similar milder rash on the arms a few weeks ago.

What is the most likely diagnosis?

- 1- Allergic contact dermatitis
- 2- Folliculitis
- 3- Herpes zoster
- 4- Irritant contact dermatitis
- 5- Paederus dermatitis

Answer & Comments

Answer: 1- Allergic contact dermatitis

Folliculitis presents with painful papulopustular follicular lesions.

Herpes zoster presents with acute onset grouped vesicular eruptions in dermatomal distribution.

Irritant contact dermatitis presents with vesicular eruption at sites of contact with the irritant, often on the exposed areas such as extremities.

Paederus dermatitis is an acute irritant contact dermatitis which presents as plaques, linear streaks or 'kissing' lesions at sites where the offending pederin from the crushed beetle comes into contact with the skin.

The question mentions a past history of similar complaints a few days back. Allergic contact dermatitis needs a sensitization dose following which the subsequent exposures manifest early with severe manifestations. Irritant contact dermatitis does not need a sensitization dose and manifests almost immediately after exposure.

This case had a milder sensitization exposure earlier followed by a severe reaction on the subsequent exposure. Hence it is a case of Allergic contact dermatitis.



[Q: 3719] OnExamination 2012 - Dermatology

A 50-year-old male presented with bullous lesions on both his feet. He also had dystrophic nails and an itchy scaly rash

affecting the groins and interdigital web spaces of his feet.

What is the most likely diagnosis?

- 1- Bullous impetigo
- 2- Bullous pemphigoid
- 3- Bullous tinea pedis
- 4- Erythema multiforme
- 5- Herpes zoster

Answer & Comments

Answer: 3- Bullous tinea pedis

Option A: Bullous impetigo presents with painful bullous lesions in children.

Option B: Bullous pemphigoid commonly starts with itching and a non-specific rash on the limbs that may be either urticaria-like or occasionally eczematous. It presents as erythematous and urticated plaques followed by tense blisters over the affected areas of trunk, limbs and flexures.

Option D: Erythema multiforme classically presents with target lesions with a central bullous lesion surrounded by an erythematous halo following the intake of an offending drug.

Option E: Herpes zoster presents with vesicobullous lesions in a dermatomal distribution.



[Q: 3720] OnExamination 2012 - Dermatology

A 12-year-old child presents with the above depressed sclerotic linear lesion of two years duration with a history of initial progression and thereafter a static phase.

What is his diagnosis?

- 1- Acrodermatitis chronica atrophicans
- 2- Aplasia cutis
- 3- En coup de sabre
- 4- Post traumatic scar

- 5- Scleroedema

Answer & Comments

Answer: 3- En coup de sabre

En coup de sabre, a variant of scleroedema is characterised by a linear, atrophic depression affecting the frontoparietal aspect of the face and scalp, suggestive of a stroke from a sword, as shown in the image. Such lesions may extend into the underlying tissues. Scalp involvement results in scarring alopecia.

Option A: Acrodermatitis chronica atrophicans affects the acral parts and not the scalp.

Option B: Aplasia cutis is congenital absence of skin. It is present at birth.

Option D: Post traumatic scar will present with obvious history of trauma in such a case. Scarring will be evident while this child has sclerosis with no obvious scarring.

Option E: Scleroedema is a misnomer. It presents with induration and occasional erythema. The lesions reveal no sclerosis and although it can present over the face, linear lesions such as this are absent.



[Q: 3721] OnExamination 2012 - Dermatology

A young male athlete presented with pedal hyperhidrosis with a non-itchy rash on both soles, with foul odour.

Examination revealed well sculpted painless pits of varying depths along both soles symmetrically.

What is the most likely diagnosis?

- 1- Corns
- 2- Erythrasma
- 3- Pitted keratolysis
- 4- Plantar warts
- 5- Tinea pedis

Answer & Comments

Answer: 3- Pitted keratolysis

Pitted keratolysis is a common infection of the thickly keratinised areas of the plantar soles by *Micrococcus sedentarius*.

It presents with sharply defined pits in the thick skin of the plantar surface of feet in areas which stay in contact with footwear in young adults. It is usually associated with pedal hyperhidrosis which promotes maceration and hence facilitates bacterial penetration. The lesions are usually non-tender.

Plantar warts are usually painful, however they may present as a mosaic collection which may be non-tender and tinea pedis presents with itchy plaques classically over the instep of the soles in an asymmetric fashion.

Option A: Corns are painful keratotic lesions which develop at pressure points.

Option B: Erythrasma appears as reddish-brown slightly scaly patches with sharp borders. The patches occur in moist areas such as the groin, armpit, and skin folds.

Option D: Plantar warts present with solitary or multiple painful verrucous lesions on the soles with obvious loss of skin markings over the lesions.

Option E: Tinea pedis presents with itchy scaly plaques typically over instep of soles and between toes.



[Q: 3722] OnExamination 2012 - Dermatology

A 43-year-old female presents with a weepy, erythematous rash mainly affecting the forehead, scalp, neck and upper back.

Three days earlier she had used red hair dye at home to self-administer 'highlights'.

What is the likely diagnosis?

1- Acne rosacea

2- Contact allergic dermatitis

3- Lupus erythematosus

4- Psoriasis

5- Seborrhoeic dermatitis

Answer & Comments

Answer: 2- Contact allergic dermatitis

Hair dye contains substances which may induce an eczematous response in form of contact allergic dermatitis.

This type of reaction is typical for this sort of time scale, and is an example of a type IV, or delayed, hypersensitivity reaction.

Sensitisation occurs on initial exposure to the allergen and 'memory' T-cells proliferate in lymphoid tissue. Subsequent exposure to allergen induces activation of the T-lymphocytes and an inflammatory response.

Hairdressing chemicals are a very common cause of contact allergic dermatitis, a disorder which is very common amongst the hairdressing community.

A lady at this age is unlikely to present with a new, previously undiagnosed case of eczema.

Acne rosacea is usually a disorder of the skin on the cheeks and nose.

Acute cutaneous lupus erythematosus presents with an erythematous rash over the face and neck. However there are no eczematous features.



[Q: 3723] OnExamination 2012 - Dermatology

A 40-year-old female presents with a six month history of pruritic papules, vesicles and excoriations on the elbows, knees, buttocks and scalp.

Her GP has prescribed topical betamethasone therapy which has been unhelpful.

What is the most likely diagnosis?

- 1- Atopic dermatitis (eczema)
- 2- Dermatitis herpetiformis (DH)
- 3- Henoch-Schönlein purpura (HSP)
- 4- Psoriasis
- 5- Scabies

Answer & Comments

Answer: 2- Dermatitis herpetiformis (DH)

The question describes the characteristic distribution of the lesions of dermatitis herpetiformis.

DH is one of the immunobullous conditions and characteristically has very intensely pruritic vesicles. It is not usually responsive to topical steroids, but would respond well to dapsone. It is associated with gluten sensitivity and coeliac disease.

Atopic eczema is non-vesicular and would respond to potent topical steroids.

HSP is a purpuric rash and is non-pruritic.

Scabies usually affect the extremities and rarely affect above the neck line. They do not cause papules and vesicles.



[Q: 3724] OnExamination 2012 - Dermatology

During a follow up visit at an asthma clinic a 38-year-old female complains of the appearance of a mole.

Which of the following characteristics of the lesion would raise suspicion that it is a malignant melanoma?

- 1- Lesion has irregular outline
- 2- Lesion is deeply pigmented
- 3- Lesion is present on face
- 4- Lesion is raised
- 5- Lesion is 6 mm in diameter

Answer & Comments

Answer: 1- Lesion has irregular outline

The mnemonic of ABCDE regarding characteristics of a melanoma are as follows:

A - Asymmetry - one half of the lesion does not match the other half

B - Border irregularity

C - Colour variegation - pigmentation is not uniform

D - Diameter- a diameter 7 mm warrants investigation although changes in size are also important

E - Evolution - evolving size or changes in characteristics such as nodules.



[Q: 3725] OnExamination 2012 - Dermatology

A 40-year-old female presents with a long history of excessive localised armpit sweating.

She finds the problem embarrassing and has problems staining clothes. She has tried antiperspirants without relief.

Which is the most appropriate treatment that you would offer this patient?

- 1- Amitriptyline
- 2- Axillary surgery
- 3- Botulinum toxin injection
- 4- Propantheline
- 5- Topical aluminium salts

Answer & Comments

Answer: 3- Botulinum toxin injection

This woman has primary hyperhidrosis which can be quite psychologically disabling.

In this case the most appropriate treatment would be botulinum toxin injection to each axilla. This treatment is licensed for use and would be the preferred treatment before

aluminium salts, as antiperspirants have failed.

Similarly, antimuscarinics are associated with systemic side effects that may prove intolerable and their efficacy is really not proven.

Pharmacological approaches should be tried before surgery.



[Q: 3726] OnExamination 2012 - Dermatology

A 20-year-old female with a history of systemic lupus erythematosus presents with symmetrical reticulated, violaceous patches, which become more prominent in cold weather involving both lower limbs.

Which of the following is the likely diagnosis?

- 1- Erythema ab igne
- 2- Erythema marginatum
- 3- Erythema nodosum
- 4- Livedo reticularis
- 5- Pyoderma gangrenosum

Answer & Comments

Answer: 4- Livedo reticularis

Livedo reticularis is due to dilation of capillary blood vessels and stagnation of blood within these vessels producing a mottled discolouration of the skin.

It is described as being reticular (net-like) cyanotic cutaneous discolouration surrounding pale central areas. It occurs mostly on the legs, arms and trunk and is more pronounced in cold weather.

Mostly it is idiopathic, or secondary to

Malignancy

Vasculitis

SLE

Cancer and

Cholesterol embolisation.



[Q: 3727] OnExamination 2012 - Dermatology

A 72-year-old woman presents with a longstanding leg ulcer.

Which of the following minerals is most important in wound healing?

- 1- Copper
- 2- Magnesium
- 3- Potassium
- 4- Selenium
- 5- Zinc

Answer & Comments

Answer: 5- Zinc

Certain supplements are important in wound healing particularly zinc, vitamin C and arginine.

Zinc is a component of many of the enzymes responsible for wound healing.



[Q: 3728] OnExamination 2012 - Dermatology

A 52-year-old female presents with blistering of the hands and arms which deteriorates during the summer. She is otherwise well and drinks approximately 20 units of alcohol weekly.

Examination of her skin revealed erosions and scarring on the backs of her hands and forearms, and some mild hirsutism.

Which one of the following is the most likely diagnosis?

- 1- Acute intermittent porphyria
- 2- Erythropoietic protoporphyria
- 3- Pemphigoid
- 4- Porphyria cutanea tarda (PCT)
- 5- Subacute lupus erythematosus (LE)

Answer & Comments

Answer: 4- Porphyria cutanea tarda (PCT)

The history of photosensitive eruption, hypertrichosis and milia formation (keratin-containing cysts) are characteristic of PCT.

Acute intermittent porphyria usually causes intermittent neurological and abdominal problems.

Subacute LE can cause erythema and scarring, but in a patient with increased alcohol intake and hypertrichosis the most likely diagnosis is PCT.

Erythropoietic protoporphyria patients get pain and erythema on exposure to sunlight.



[Q: 3729] OnExamination 2012 - Dermatology

A 16-year-old girl is seen in clinic as she is concerned due to areas of hair loss on the scalp.

Past medical history includes atopic eczema and she has a number of depigmented areas on her hands.

What is the most likely diagnosis?

- 1- Alopecia areata
- 2- Hypothyroidism
- 3- Seborrhoeic dermatitis
- 4- Systemic lupus erythematosus
- 5- Trichotillomania

Answer & Comments

Answer: 1- Alopecia areata

This girl has a combination of vitiligo and alopecia areata which can co-exist and have similar autoimmune aetiology.

Discrete areas of hair loss and normal texture on the scalp are highly suggestive of alopecia areata.



[Q: 3730] OnExamination 2012 - Dermatology

In the treatment of psoriasis, which of the following statements is correct?

- 1- Etanercept is not effective in psoriatic arthritis
- 2- Infliximab is associated with tuberculosis
- 3- PUVA is ineffective
- 4- Retinoids are the most useful monotherapy in psoriatic patients
- 5- Vitamin D analogues are associated with cutaneous atrophy

Answer & Comments

Answer: 2- Infliximab is associated with tuberculosis

Psoralen and ultraviolet light (PUVA) is an effective treatment for psoriasis but has been related to increased risk of squamous cell carcinoma, and possibly malignant melanoma.

Retinoids are most effective in combination therapy especially with ultraviolet B (UVB) phototherapy and PUVA.

Part of the attraction of vitamin D analogues over steroids is that they do not cause cutaneous atrophy whereas steroids do.

The recombinant tumour necrosis factor and receptor fusion protein, etanercept, has demonstrated considerable beneficial effects on psoriatic arthropathy in placebo controlled, double blind studies.

Infliximab is associated with tuberculosis by reactivation of latent disease. Thus it is advised that patients who are to be treated with infliximab are tuberculin tested and if required receive chest radiography.



[Q: 3731] OnExamination 2012 -
Dermatology

A 58-year-old man has a history of obesity, gastro-oesophageal reflux disease, low back pain and IHD.

He presents with large, itchy weals over the trunk and limbs and a sensation of tightness in the throat.

Which one of the following drugs is the most likely to have triggered this skin eruption?

- 1- Aspirin
- 2- GTN (nitrate) spray
- 3- Omeprazole
- 4- Paracetamol
- 5- Simvastatin

Answer & Comments

Answer: 1- Aspirin

In hypersensitive patients, aspirin can cause:

Angioedema
Bronchospasm
Urticaria (skin rashes).



[Q: 3732] OnExamination 2012 -
Dermatology

Which is true regarding eczema herpeticum?

- 1- Is invariably fatal if untreated
- 2- Is more severe in reactivation disease
- 3- Is typically associated with a high fever for over a week
- 4- Only a single crop of vesicles usually appear
- 5- Usually has an indolent onset

Answer & Comments

Answer: 3- Is typically associated with a high fever for over a week

Eczema herpeticum is the result of primary infection of eczematous skin with Herpes

simplex virus (HSV). The severity varies from mild to fatal.

There is usually an abrupt onset with crops appearing over seven to nine days. These may become coalesced. Typically, the child has a high fever for seven days, and recurrent attacks can occur.

Death can result from physiological disturbances (loss of fluid electrolytes and protein through the skin) or dissemination of the virus to brain and other organs or from secondary bacterial sepsis.



[Q: 3733] OnExamination 2012 -
Dermatology

What is the most common presenting feature of porphyria cutanea tarda?

- 1- Acute blistering crises affecting the trunk and limbs
- 2- Acute redness and swelling following sun exposure
- 3- Erythroderma
- 4- Generalised hypertrichosis
- 5- Skin fragility and blistering affecting the hands, face and scalp

Answer & Comments

Answer: 5- Skin fragility and blistering affecting the hands, face and scalp

Porphyria cutanea tarda (PCT) is a term that encompasses a group of related disorders, all of which arise from deficient activity of the haeme-synthetic enzyme uroporphyrinogen decarboxylase (URO-D) in the liver.

The porphyrins produced in PCT are photoactive molecules that absorb light energy strongly in the visible violet spectrum. Photoexcited porphyrins in the skin mediate oxidative damage to biomolecular targets, causing cutaneous photosensitivity reactions.

The most common presenting sign of PCT is fragility of sunexposed skin after mechanical trauma, leading to erosions and bullae, worst on dorsal hands, forearms and face.



[Q: 3734] OnExamination 2012 - Dermatology

A 75-year-old female presents with chronic leg ulceration which is a consequence of venous insufficiency.

Which one of the following is the most appropriate management?

- 1- Appropriate systemic antibiotic in preparation for skin grafting
- 2- Compression bandaging
- 3- Improve the venous return by limb elevation
- 4- Skin biopsy to exclude neoplasm
- 5- Vein surgery exclusion of neoplasm by skin biopsy

Answer & Comments

Answer: 2- Compression bandaging

Venous ulcers are secondary to venous stasis and chronic stretching vessel of the vein walls of the superficial veins.

These eventually become thinner and ulcerate.

The only treatment shown in studies to be beneficial for this condition would be to compress the superficial venous using a four layer compression bandage.

The patient should always have their Doppler's and ABPI (ankle brachial pulse index) prior to compression. This should be greater than 1.



[Q: 3735] OnExamination 2012 -
Ethics and law

An 85-year-old lady with advanced Alzheimer's dementia has inhaled her hearing aid. The respiratory rate is 35. A bronchoscopy is proposed.

Which of the following apply with regard to obtaining consent for the procedure?

- 1- If the mini mental score is above 20/30, consent can be taken from patient
- 2- Psychogeriatric opinion is needed before consent can be obtained
- 3- Relatives/next of kin will have to consent for the patient
- 4- The doctor will be able to consent for the patient
- 5- The procedure does not require a written consent

Answer & Comments

Answer: 5- The procedure does not require a written consent

In this case, which is an emergency, informed written consent is not essential as the procedure is potentially life-saving and the doctor would be seen to be acting in the patient's best interest.

The process of consent for a procedure relies upon written and informed consent which the patient has to understand.

When a patient has impaired mental capacity, the doctor may be uncertain whether the patient is competent to give informed consent. Under English law no other person can consent to treatment on behalf of an adult, though it is desirable that next of kin are consulted before treating an adult without consent.

Recent legislation gives legal authority to people appointed by the patient, or by the state, or a relative or carer, to consent (or refuse) on behalf of the patient.

A mini-mental score may not adequately identify those unable to give consent.



[Q: 3736] OnExamination 2012 -
Ethics and law

A patient of yours suffers a myocardial infarction and dies in Spain. His relatives arrange for his body to be repatriated and plan for him to be cremated.

You last saw him alive seven days before his death.

Which of the following is true with respect to completion of cremation forms?

- 1- A colleague should complete form 4
- 2- A cremation may only take place if a coroner rules that no inquest or post mortem is needed
- 3- The Spanish doctor who originally treated him should complete form 4
- 4- You are allowed to complete form 5
- 5- You are allowed to complete forms 4 and 5

Answer & Comments

Answer: 2- A cremation may only take place if a coroner rules that no inquest or post mortem is needed

Where deaths abroad are concerned, a cremation may only take place if the coroner is satisfied that a post mortem or inquest is not necessary.

It is highly unlikely that you will be in a position to complete forms 4 and 5, and it is not appropriate for form 4 to be completed by the Spanish doctor who originally treated the patient.

Ministry of Justice cremation guidelines



[Q: 3737] OnExamination 2012 -
Ethics and law

You are the general practitioner of a 76-year-old man who has been suffering from

bronchial carcinoma for the past one and a half years. He is requiring increasing amounts of morphine to cope with his pain, and he dies in his sleep.

You certify the cause of death as bronchial carcinoma.

His wife who requests cremation asks to see form 4.

Which of the following is true with respect to her viewing the form?

- 1- She is not allowed to view it in any circumstances
- 2- The form should be typewritten if possible
- 3- The name of the completing doctor must be obscured
- 4- You can apply for certain information not to be disclosed by discussing this with the referee
- 5- You cannot prevent her from reviewing all aspects of the form

Answer & Comments

Answer: 4- You can apply for certain information not to be disclosed by discussing this with the referee

The recent cremation regulations detail that the cremation applicant can view the form.

There may be circumstances though when you wish for certain information not to be disclosed, that the patient may have told you in confidence. In this case you can write to the cremation referee requesting that certain pieces of information are withheld.

In the case of a patient with an underlying carcinoma this might be details around the diagnosis or co-morbidities that the patient may have withheld from relatives during life.

When you complete the form it is important that you remember the information may be seen by a relative; also make sure that your handwriting is as legible as possible.

Ministry of Justice cremation guidelines



[Q: 3738] OnExamination 2012 - Ethics and law

A 30-year-old male is unconscious on admission following a road traffic accident. He was the driver of the car and there is the suspicion that he was responsible for the accident in which a passenger of another car died. In attendance with the patient is his wife who was uninjured in the accident. The police are keen to obtain a blood sample for alcohol measurement but the patient is incapable of giving consent for this procedure.

What is the most appropriate action in these circumstances?

- 1- Inform the police that you may only take blood samples on medical grounds.
- 2- Draw a blood sample for later analysis when the patient is competent to consent.
- 3- Draw a blood sample which can be analysed immediately.
- 4- Obtain consent from his wife, as next of kin, to draw the blood sample.
- 5- Refuse to obtain a blood sample until the patient is competent to provide consent.

Answer & Comments

Answer: 2- Draw a blood sample for later analysis when the patient is competent to consent.

There is clear guidance published on such a situation by the BMA. Following the Police Reform Act, it is no longer necessary to obtain consent from unconscious or incapacitated drivers. However, the sample is not tested until the person regains competence and gives valid consent to it being tested. A competent person who refuses to allow his or her sample to be tested might be liable to prosecution. Similarly, the new law recognises the duty to justice.



[Q: 3739] OnExamination 2012 -
Ethics and law

You intend to undertake a study of patients who have undergone excision of minor lumps and bumps over the last five years.

Specifically you wish to compare post-operative infection rates and also whether there are any differences between the clinical diagnosis and the histological diagnosis between the differing grades of practitioner performing the procedure.

Which of the following statements are correct concerning this study?

- 1- Approval for the study must be obtained from the local ethics committee.
- 2- If a study has already published with exactly the same concept then this constitutes plagiarism.
- 3- If such a study has already been published then the investigators must obtain consent from the original authors to replicate their work.
- 4- The study is flawed in its design and should not be performed.
- 5- This is an audit and does not require ethical committee approval.

Answer & Comments

Answer: 1- Approval for the study must be obtained from the local ethics committee.

This is not an audit.

There is no information provided to indicate that there are either any local or national guidelines relating to such a study. Furthermore, there is no information provided to indicate that there is a specific clinical problem to which an audit should be addressed.

Consequently, this is a research study and is a retrospective study. As such, it requires local ethical committee approval.

The study itself seems very reasonable and even if it were published elsewhere it would still be reasonable to perform in the investigator's practice as the outcomes may be completely different.

Using the same methods as another study is perfectly justifiable, if only to prove the veracity of the original publication.

No consent is required from the original authors if a similar study has already been published.



[Q: 3740] OnExamination 2012 -
Ethics and law

You are intending to publish a case report as a fascinoma of the month within a national medical journal. As part of the publication you provide an image from the MRI film of the abdomen.

Medical Illustration have transferred the film to electronic format and have removed all patient identification markings. The case report itself is otherwise completely anonymous.

Which of the following concerning consent is correct?

- 1- Consent for publication may not be required depending on the journal to which the manuscript is submitted
- 2- Consent for publication must be sought from the local ethics committee
- 3- Consent for publication of the image must be obtained from the radiologist
- 4- Patient consent for publication is not required
- 5- Patient consent must be provided for publication

Answer & Comments

Answer: 5- Patient consent must be provided for publication

There is much controversy concerning case reports and consent but without question, prior to publication, and particularly as you are using images, consent for publication must be obtained from the patient for use of both images and for the publication of the case report.

This consent must also be appropriately informed.

All UK journals expect this prior to publication despite the anonymity of the subject matter.

This is not an issue for which medical ethics committees are involved.

This is a complex area and there is flexibility around publication of images. However, there have been incidences of x rays being published which have been deemed to have been an invasion of privacy.



[Q: 3741] OnExamination 2012 - Ethics and law

Does integrity refer to a virtue that requires the physician to do the following?

- 1- Acknowledge and respond to the suffering of patients
- 2- Ignore irrelevant differences between the physician and the patient
- 3- Practise medicine according to intellectual and moral standards of excellence
- 4- Risk health and life in the care of patients
- 5- Treat in the best interests of the patient

Answer & Comments

Answer: 3- Practise medicine according to intellectual and moral standards of excellence

Integrity refers to the practise of medicine according to appropriate ethical standards and excellence.



[Q: 3742] OnExamination 2012 - Ethics and law

By which of the following are most deaths determined?

- 1- Absent pulse
- 2- Brain stem tests
- 3- Loss of pupillary reflex
- 4- The absence of vital signs
- 5- The coroner

Answer & Comments

Answer: 4- The absence of vital signs

The absence of vital signs is the commonest mode of diagnosing death and entails

Absent pulse

Absent heart sounds

Respiratory arrest and

Loss of pupillary light reflex.

Brain stem tests are generally reserved for ventilated cases where organ transplantation may be required.

Doctors most commonly diagnose death not the coroner who provides a verdict on the cause of death.



[Q: 3743] OnExamination 2012 - Ethics and law

A placebo is defined as which of the following?

- 1- A standard treatment against which a newer treatment is compared
- 2- A substance given as a treatment for a disorder
- 3- A way to deceive a patient into taking a medication
- 4- An inert substance given as a medicine in an assessment of its suggestive effect

- 5- The medication given to a patient for a specific type of ailment

Answer & Comments

Answer: 4- An inert substance given as a medicine in an assessment of its suggestive effect

A placebo typically produces mainly a psychological effect when administered to a patient or person involved in a trial.



[Q: 3744] OnExamination 2012 - Ethics and law

Which medical procedure highlighted the need for new methods of defining and determining death in the face of continued cardiorespiratory function?

- 1- Artificial resuscitation
- 2- Brain surgery
- 3- ITU ventilation
- 4- Open heart surgery
- 5- Organ transplantation

Answer & Comments

Answer: 5- Organ transplantation

The conventional criteria previously established for clinical death were based upon lack of cardiorespiratory function.

The development of organ transplantation highlighted patients who had conditions incompatible with life, but who continued to have some form of cardiorespiratory function with artificial support. This led to a code of practice for the diagnosis of brainstem death.

This is based on the knowledge that when the brainstem is damaged to such a degree that its functions are irreversibly destroyed, the heart will inevitably stop beating shortly afterwards. When this occurs, therefore, the patient is dead even though respiration and circulation can be artificially maintained.

Brain stem function is checked through set criteria, and the findings must be agreed by at least two senior doctors. 'Life-support' should be withdrawn at this point, but consideration should be taken as to whether the person would be a suitable organ donor.



[Q: 3745] OnExamination 2012 - Ethics and law

A 76-year-old female was admitted 24 hours ago following a fall.

The orthopaedic senior house officer asks for your help because the patient is shouting out on the ward keeping all the other patients in the bay awake. He tells you that he is not able to reason with her and that she is distracted and incoherent. On arrival you note that her left leg is shortened and externally rotated.

Which one of the following additional findings would suggest a diagnosis of delirium rather than dementia?

- 1- A positive Urine dipstick
- 2- MMSE of 28 in the patient's notes that was done six months ago
- 3- The patient has been given lorazepam with minimal effect
- 4- The patient is febrile at 38?
- 5- The patient was coherent and compliant on admission

Answer & Comments

Answer: 5- The patient was coherent and compliant on admission

Delirium is diagnosed using the DSM-IV classification or short confusion assessment method (CAM).

Features of CAM are:

Acute onset and fluctuation course (within the last day)

Inattention

Disorganised thinking

Altered level of consciousness (hypo- or hyperactive).

For a diagnosis of delirium the patient must have 1 and 2 and either 3 or 4.

Answer A is incorrect because a positive dipstick may help you to ascertain a cause for delirium, but you have to use CAM for the diagnosis.

Answer B is incorrect because a MMSE of 28 done six months ago shows you that the patient was cognitive intact six months ago, but you have to use CAM to diagnose delirium.

Answer C is incorrect because you have to use CAM to diagnose delirium.

Answer D is incorrect because a fever may help you to ascertain the cause for delirium, but you have to use CAM for the diagnosis.



[Q: 3746] OnExamination 2012 - Ethics and law

A 63-year-old smoker has been investigated for a cough and chest pain and a diagnosis of bronchial carcinoma is made on a plain chest x ray examination.

Before a tissue diagnosis can be made, he dies in hospital of a large and unexpected haemoptysis and a post mortem examination is carried out with the consent of the relatives. At this examination, the correct diagnosis is shown to be tuberculosis and there is no carcinoma.

In this circumstances, is it mandatory to make a report to a particular authority, and if so, which?

- 1- Consultant in Communicable Diseases Control
- 2- Coroner
- 3- General Medical Council
- 4- Health and Safety Executive
- 5- Strategic Health Authority

Answer & Comments

Answer: 1- Consultant in Communicable Diseases Control

A diagnosis of bronchial carcinoma cannot be made without a tissue biopsy.

There are a number of notifiable infectious diseases that it is mandatory to report to the Consultant in Communicable Diseases Control. They include:

- Tuberculosis
- Malaria
- Meningitis
- Meningococcal sepsis.



[Q: 3747] OnExamination 2012 - Ethics and law

You are completing a list of cremation form 5s for patients in the hospital where you work.

You examine one form where the junior doctor has completed the cause of death as stroke, but the patient appears to have fallen at home. The husband wants to arrange cremation as soon as possible.

Apparently the junior doctor is working nights and has gone home, so you cannot easily get hold of him to question him further.

Which of the following is true with respect to completion of the form?

- 1- Completion of form 5 to show that examination of the case has been "adequate" would be acceptable
- 2- It is acceptable in this case not to question the doctor
- 3- Medical referees will not mind if you have not contacted the doctor
- 4- When completing form 5 you must only be reasonably sure that the patient suffered a stroke

- 5- You should wait to complete the form until the doctor is available to answer questions

Answer & Comments

Answer: 5- You should wait to complete the form until the doctor is available to answer questions

Doctors are now instructed that form 5 should always be completed after questioning the doctor who completed form 4 except under exceptional circumstances, that is, only if the doctor is seriously ill.

Unavailability of the doctor is not an appropriate excuse, so quite clearly in this case you should wait to complete the form.

The other major principle with respect to completion of form 5 is that you must be absolutely sure that the cause of death is correct.

Ministry of Justice cremation guidelines



[Q: 3748] OnExamination 2012 - Ethics and law

A female patient of yours unfortunately goes into premature labour at 23 weeks. The fetus is not viable. She wishes to have the fetal remains cremated.

Which of the following is true with respect to legal aspects of this case?

- 1- Cremation of the remains is not subject to the Cremation Act
- 2- Only a pathologist is allowed to complete form 4
- 3- Only form 4 need be completed
- 4- Only form 5 need be completed
- 5- The case must be discussed with the coroner

Answer & Comments

Answer: 1- Cremation of the remains is not subject to the Cremation Act

Cremation of fetal remains under 24 weeks is not subject to the Cremation Act.

As such, forms 4 and 5 should not be completed.

In spite of this, most crematoria are happy to make arrangements to cremate fetal remains.

Where body parts are removed at post mortem, arrangements for cremation of these are normally made by the pathology service.

Ministry of Justice cremation guidelines



[Q: 3749] OnExamination 2012 - Ethics and law

You are working for the elderly care team in the hospital when an 82-year-old woman under your care is found dead by the nursing staff in the early hours of the morning.

She was not resuscitated due to a history of severe chronic obstructive pulmonary disease (COPD).

You have written the cause of death as old age and you complete cremation form 4.

Which of the following is true with respect to completion of the forms?

- 1- Civil proceedings have been taken against doctors who have inappropriately completed form 5
- 2- Old age is usually not an acceptable cause of death for cremation purposes when completing form 4
- 3- The consultant who heads up the team may complete form 5
- 4- The locum staff grade who qualified three years ago in India may sign form 5
- 5- Your brother who is a house officer on another team at the hospital may sign form 5

Answer & Comments

Answer: 2- Old age is usually not an acceptable cause of death for cremation purposes when completing form 4

A key point with respect to completing form 4 is that the cause of death must be accurately established.

Whilst old age may be acceptable when certifying for a burial, it is not accepted by cremation referees.

The latest guidelines for doctors include specific instructions that members of the same hospital team as the physician completing part 4 must not complete the form, nor may partners in the same GP practice complete the form either.

Additionally, relatives of the patient are forbidden from completing either form 4 or 5, and relatives of the doctor who completes form 4 cannot complete form 5.

Ministry of Justice cremation guidelines



[Q: 3750] OnExamination 2012 - Ethics and law

A 23-year-old female attends clinic for a routine appointment regarding a six month history of occasional fits.

She has seen the neurologists who have diagnosed idiopathic epilepsy and have prescribed lamotrigine. She informs you that she is doing well with this medication and has not had a fit for two months.

She has been told that she must stop driving but you have seen that she drove to attend the clinic. You discuss this with her and insist that she stops driving to which she informs you that she had stopped driving but since she is fit free she must continue to drive because of her employment.

Which of the following is the most appropriate action to take in these circumstances?

- 1- Inform patient that you will notify the DVLA
- 2- Inform patient that you will notify the police
- 3- Inform the epilepsy clinic that she is still driving and allow them to deal with this issue.
- 4- You cannot inform any external body due to patient confidentiality.
- 5- Your only action is to write in the notes that the patient has been repeatedly warned but chose to ignore advice as she presents no serious risk in view of her epilepsy control.

Answer & Comments

Answer: 1- Inform patient that you will notify the DVLA

The law is quite clear on such issues regarding epilepsy and the ability to drive.

If the diagnosis is confirmed the patient must stop driving and inform the DVLA regarding the diagnosis.

If the patient continues to drive despite advice to the contrary then the doctor has a duty of care to society overriding confidentiality to the patient and may inform the DVLA.



[Q: 3751] OnExamination 2012 - Ethics and law

A 78-year-old male dies and is found by his children the following morning (after having seen him alive the night before). His GP attends to certify him dead.

The patient had a known history of ischaemic heart disease and was treated in the local hospital where angiography performed nine months previously for angina had revealed some insignificant coronary artery disease of two vessels for which medical therapy was deemed most appropriate. He had also been

diagnosed eight years previously with diabetes mellitus for which he took metformin and gliclazide.

He had seen the practice nurse two weeks ago for review of his diabetes. One month ago he had seen the diabetologists for his annual review and had seen the cardiologists approximately six months ago. He had last seen a partner in the practice six weeks ago for advice concerning driving licence registration.

The family are keen to have a death certificate issued and proceed to cremation. They do not want any post mortem examination.

Which of the following is true with regard to issuing of a death certificate in this scenario?

- 1- The certifying doctor may issue a death certificate
- 2- The death needs to be referred to the coroner
- 3- The diabetologist can certify the death
- 4- The partner in the practice may issue a death certificate
- 5- The practice nurse can certify the death

Answer & Comments

Answer: 2- The death needs to be referred to the coroner

A death certificate may be completed if the practitioner has seen the deceased within 14 days of the death (28 days in NI). In this case the patient had been seen six weeks previously by the partner.

Consequently, and in view of the sudden death, the coroner should be informed, although he may decide that in the circumstances reported, the doctor may be able to issue a death certificate stating ischaemic heart disease if he deems it appropriate, and on the balance of advice given to him.



[Q: 3752] OnExamination 2012 - Ethics and law

Withholding the truth about a patient's illness is a violation of which of the following?

- 1- Autonomy
- 2- Beneficence
- 3- Informed consent
- 4- Infringement of the Human Rights Act
- 5- The Bolam principle

Answer & Comments

Answer: 1- Autonomy

By not informing the patient about all the aspects of their illness we are removing their ability to make decisions for themselves. In effect we, and their relatives, are making the decisions for them. This is the removal of their autonomy.

Informed consent relies upon the patient being provided with the information that is generated from the investigations to which he has consented. Justice implies going beyond one's own feelings, prejudices, and desires to find an appropriate balance among conflicting interests.

The Bolam principle is the basis upon which a doctor's actions are judged such that they would be considered appropriate and reasonable to those actions that would be performed by a responsible body of their peers in similar circumstances.



[Q: 3753] OnExamination 2012 - Ethics and law

A 75-year-old woman presents with a 6-12 Hz tremor in the hands.

The tremor initially started in the right hand, but has worsened over time and now involves both hands. The tremor has also slowly increased in severity. She remembers that her father suffered from 'the shakes' as well.

Which additional finding would suggest a diagnosis of essential tremor rather than Parkinson's disease?

- 1- Action tremor
- 2- Bradykinesia
- 3- Kinetic tremor
- 4- Postural tremor
- 5- The tremor increases with emotional stress

Answer & Comments

Answer: 1- Action tremor

One of the main characteristics of essential tremor is that the tremor is an action tremor. Action tremor constitutes both postural and kinetic tremor.

Answer B is incorrect as bradykinesia is a key feature of Parkinson's disease and not essential tremor.

Answer C is incorrect as essential tremor has both kinetic and postural tremor which constitutes an action tremor. Parkinson's disease has a resting tremor.

Answer D is incorrect because essential tremor has both postural and kinetic tremor which constitutes an action tremor. Parkinson's disease has a resting tremor.

Answer E is incorrect because the tremor in both Parkinson's disease and essential tremor may worsen with emotional stress.

Reference:

http://www.ninds.nih.gov/disorders/tremor/detail_tremor.htm



[Q: 3754] OnExamination 2012 - Ethics and law

A 70-year-old man is brought to the memory clinic by his wife.

The patient appears calm and composed and does not have any complaints. His wife said over the last three months her husband lost

his way back home in the evening three times and was brought back by the neighbours.

Choose the appropriate diagnosis from the following list.

- 1- Alcoholism
- 2- Chronic subdural haematoma
- 3- Depression
- 4- Dementia
- 5- Transient global amnesia

Answer & Comments

Answer: 4- Dementia

Because the confusion occurred in the evenings, alcoholism is a possibility and should be explored in the history. However, it is not mentioned in the scenario, hence alcoholism is unlikely.

Chronic subdural haematoma and depression would present with gradual and persistent change in personality without any recovery. However, chronic subdural haematoma and depression should be excluded in all cases of suspected dementia.

Transient global amnesia almost always occurs as a single episode.



[Q: 3755] OnExamination 2012 - Ethics and law

Which of the listed common conditions can mimic the signs and symptoms of an acute stroke?

- 1- Cardiac arrest
- 2- Hypoglycaemia
- 3- Hypothyroidism
- 4- Pneumothorax
- 5- Stokes-Adams attacks

Answer & Comments

Answer: 2- Hypoglycaemia

Hypoglycaemia is common and mimics signs and symptoms of acute stroke; hence determination of blood glucose and treatment of hypoglycaemia is part of the initial assessment of a patient with symptoms or signs of acute stroke.

Signs of cardiac arrest are

Unresponsiveness

No breathing

No pulse and

Absence of other signs of circulation.

Stokes-Adams attacks present with sudden short lasting loss of consciousness resulting in falls.

Hypothyroidism and pneumothorax are obviously false answers.



[Q: 3756] OnExamination 2012 - Ethics and law

Which of the following drugs would improve prognosis in heart failure?

- 1- ACE - I
- 2- Atenolol
- 3- Digoxin
- 4- Furosemide
- 5- Nitrates

Answer & Comments

Answer: 1- ACE - I

Furosemide is effective in improving symptoms secondary to volume overload, it does not improve prognosis.

However, the randomised Aldactone evaluation study (RALES) trial has shown 30% reduction in mortality when spironolactone was added to conventional treatment.

Atenolol has not been evaluated in the management of heart failure.

Carvedilol, metoprolol and bisoprolol have been proven through trials to improve prognosis in heart failure.

Trials showed digoxin neither increased nor decreased total cardiovascular mortality because reduction in deaths due to progressive heart failure was balanced by an increase in deaths due to ischaemia and arrhythmia as a result of digoxin therapy.

Hydralazine and isosorbide nitrate in combination have been shown to be as effective as ACE-I for improving symptoms, but these drugs do not alter prognosis.



[Q: 3757] OnExamination 2012 - Ethics and law

Which one of the following deaths should be reported to the coroner?

- 1- A 52-year-old male with a long history of alcohol abuse is admitted with confusion. He dies two days later with hepatic failure.
- 2- A 62-year-old male with a two year history of severe dementia is admitted from a nursing home with fever and breathlessness. He dies three days later with pneumonia.
- 3- A 69-year-old male with pneumoconiosis is admitted with fever and breathlessness. He dies two days later from pneumonia.
- 4- A 72-year-old male is admitted with a myocardial infarction and dies 48 hours following admission.
- 5- A 73-year-old female who had undergone a hip replacement two months previously presents with severe chest pain and breathlessness. She is diagnosed with pulmonary embolism but dies.

Answer & Comments

Answer: 3- A 69-year-old male with pneumoconiosis is admitted with fever and breathlessness. He dies two days later from pneumonia.

Increasingly emphasis is placed on the appropriate reporting of deaths particularly from the enquiries into Shipman and the Coroners Reform Bill. In fact, it is the duty of the Registrar of Births, Deaths and Marriages to report a death to the coroner but doctors need to be aware of the circumstances in which a death should be reported.

These include:

The cause of death is unknown.

The deceased was not seen by the certifying doctor either after death or within 14 days before death.

The death was violent or unnatural.

The death may be due to an accident.

The death may be due to self neglect or neglect by others.

The death may be the result of industrial illness or due to the persons employment (as with the 69-year-old male above, pneumoconiosis being an industrial disease).

The death may be due to an abortion.

The death occurred during an operation or before recovery from anaesthesia.

The death may be suicide.

The death occurred during or shortly after being taken into police custody.

The MDU have published a guide to Coroners Inquiries which is free to members:

www.the-mdu.com



[Q: 3758] OnExamination 2012 - Ethics and law

A 22-year-old female is admitted following severe injuries sustained in a road traffic accident. She is communicative but in shock with low blood pressure and tachycardia.

You realise that without a transfusion she will die but she informs you that she has recently

become a Jehovah's Witness and that she adamantly refuses transfusion, despite knowledge that she could die.

Her distraught parents tell you that she has only recently joined the Jehovah's Witnesses and implore you to transfuse her, as they insist that she does not know her own mind.

Together with other intervention which she permits, what is the most appropriate action regarding possible transfusion?

- 1- Declare her incompetent and transfuse
- 2- Do not transfuse even if it means that she will die
- 3- Get immediate psychiatric intervention to section her and then transfuse
- 4- Transfuse immediately, irrespective of the patient's wishes
- 5- Wait until she becomes unconscious and then get consent from her parents to transfuse

Answer & Comments

Answer: 2- Do not transfuse even if it means that she will die

The patient appears competent and has elected to refuse the transfusion. Despite the parents' protestation you must respect the patient's wishes if, as seems likely here, she is making a reasoned judgement.

If the patient refuses the transfusion then even if she slips into unconsciousness you are not permitted to treat with transfusion even if it is in her best interests.



[Q: 3759] OnExamination 2012 - Ethics and law

Which of the following defines ethics?

- 1- Codes and statements of professional organisations of physicians about appropriate conduct
- 2- Obedience to the law

- 3- Prescriptions found in Scripture
- 4- The study of morality
- 5- The study of the human conscience

Answer & Comments

Answer: 4- The study of morality

Ethics are defined as the study of morality/the philosophical study of moral values and rules.



[Q: 3760] OnExamination 2012 -
Ethics and law

In which of the following cases is the individual's right to autonomy violated?

- 1- A Jehovah's witness patient with symptomatic anaemia who refuses blood transfusion
- 2- An athlete who seeks a second opinion
- 3- An infant whose parents elect for surgery to correct a congenital heart defect
- 4- An older man whose physician and family coerce him into having foot surgery
- 5- An older woman who refuses to undergo back surgery

Answer & Comments

Answer: 4- An older man whose physician and family coerce him into having foot surgery

Autonomy refers to an individual's right to be self-governing.

Although the procedures may be in the best interests of the patient, if the patient refuses and this refusal is informed, then the doctor or relatives cannot coerce that person into having the procedure.



[Q: 3761] OnExamination 2012 - Psychiatry

A 17-year-old male is brought to clinic as his parents are concerned about changes in his behaviour.

Which of the following suggest a diagnosis of schizophrenia?

- 1- Auditory hallucinations with clouding of consciousness
- 2- Feelings of panic in buses and shops
- 3- Grandiose ideations
- 4- Incongruity of affect
- 5- Memory impairment

Answer & Comments

Answer: 4- Incongruity of affect

Incongruity of affect is emotion inappropriate to circumstances. Although not one of the first-rank symptoms of schizophrenia, it is consistent with the diagnosis.

Auditory hallucinations are typical, especially third person, but clouding of consciousness is not typical.

The panic in crowds suggests an anxiety disorder and grandiose ideations suggest mania.



[Q: 3762] OnExamination 2012 - Psychiatry

The parents of an 8-year-old boy have noticed increased blinking and throat clearing.

He had normal development and is doing well at school until recently when he was sent home for shouting swear words during assembly.

His parents have not noticed any change in behaviour, with normal appetite, sleep and energy. He takes no medication. His father suffers with partial seizures.

What is the likely diagnosis?

- 1- Epilepsy
- 2- Huntington's disease
- 3- Rett syndrome
- 4- Tourette syndrome
- 5- Wilson's disease

Answer & Comments

Answer: 4- Tourette syndrome

Tourette syndrome presents before 18 years of age and many children grow out of it.

The criteria for diagnosis require multiple motor and one or more vocal tics, showing themselves over a year, with not more than three consecutive months tic free. The motor tics often have a build up that the patient is aware of, like an itch. Commonly they involve blinking, throat clearing or shoulder shrugging.

Although his father has epilepsy this is unlikely to be epilepsy as the shouting of swear words is a typical vocal tic of Tourette's.

Huntington's disease is a neurodegenerative genetic disorder that is autosomal dominant. The features are of choreiform movements, problems with coordination and walking, behavioural and psychiatric problems. The disease leads eventually to dementia and premature death.

Rett syndrome predominantly affects females and is a neurodevelopment disorder of the grey matter. The sufferers have small hands and feet with deceleration of head growth. Many patients are epileptic, display repetitive hand movements, rarely develop speech and also have GI problems, such as constipation.

Wilson's disease is an autosomal recessive condition which causes build up of copper in the body. Copper accumulates in the liver and brain. This results in hepatitis, liver failure or cirrhosis. Accumulation in the brain can result in behavioural changes, depression, seizures,

parkinsonism, however the initial sign is usually increased clumsiness.



[Q: 3763] OnExamination 2012 - Psychiatry

A 32-year-old man visits his GP complaining that he is totally depressed and fixated by the loss of his wife and child who were killed by a hit and run driver around one year earlier.

He says that he has taken to drinking large quantities of alcohol every day and occasionally even smoking heroin in an attempt to forget what happened and stop the memories of the event playing back in his mind. He cannot hold down a job because he finds it impossible to concentrate, is constantly irritable and hardly sleeps at night. He attends the clinic with his mother who tells you that he has not cried since the event.

Which of the following is the most appropriate treatment for him?

- 1- Cognitive therapy
- 2- Diazepam
- 3- Mirtazapine
- 4- Paroxetine
- 5- Phenelzine

Answer & Comments

Answer: 1- Cognitive therapy

This man has post traumatic stress disorder (PTSD) as a result of the horrific event which led to the death of his wife and child.

NICE guidelines support the use of trauma focussed cognitive behavioural therapy as the mainstay of therapy.

Other options include:

Eye movement desensitisation

Reprocessing and relaxation techniques.

Drug therapies are very much second line therapy for PTSD, although they may be of

value in treating associated co-morbidities such as depression, with selective serotonin reuptake inhibitors (SSRIs) being recommended by NICE as first line drug therapy.

Clinicians are warned, however, that increased agitation may lead to suicidal ideation during the first few weeks of treatment.



[Q: 3764] OnExamination 2012 - Psychiatry

A 45-year-old female with chronic schizophrenia was recently converted to a new antipsychotic agent. She presented two weeks later with a sore throat and fever.

Her full blood count shows:

Haemoglobin 12.5 g/dl(11.5-16.5)

White cell count $1.3 \times 10^9/L$ (4-11)

Platelets $135 \times 10^9/L$ (150-400)

What drug is she likely to have commenced?

- 1- Clozapine
- 2- Haloperidol
- 3- Olanzapine
- 4- Quetiapine
- 5- Risperidone

Answer & Comments

Answer: 1- Clozapine

Clozapine is associated with agranulocytosis and granulocytopenia in approximately 1-2% of patients, which can result in fatal sepsis. The mechanism through which this happens remains unclear. In order to safeguard against harm a UK Clozaril Patient Monitoring System ensures strict monitoring of all patients on this treatment. A white cell count with differential is checked prior to treatment, then weekly for the first 18 weeks, then two weekly from week 18 to 52, and then four weekly after one year of clozapine with stable

blood results. They are then checked for four weeks after discontinuation of treatment.

Olanzapine has been associated with agranulocytosis in the form of case reports in the literature. However, unlike clozapine, this link is not well established.

None of the other medications listed are commonly associated with agranulocytosis.



[Q: 3765] OnExamination 2012 - Psychiatry

A 22-year-old woman presented following an overdose. She had had an argument with her boyfriend and had then driven to an isolated country lane where she had swallowed 20 paracetamol tablets and a bottle of wine.

Which one of the following is the strongest predictor that she may later make a fatal suicide attempt?

- 1- Female gender
- 2- Location of the suicide attempt
- 3- Taking alcohol with the tablets
- 4- The argument with the boyfriend
- 5- The number of tablets

Answer & Comments

Answer: 2- Location of the suicide attempt

About one-third of people who attempt suicide will repeat the attempt within one year, and about 10% of those who threaten or attempt suicide eventually do kill themselves.

There are certain characteristics that have been found in those who are more likely to repeat an attempted suicide.

These characteristics include

Age of 45 or more

The fact of being male

A previous attempt which resulted in hospital admission

Problems with drugs or alcohol

Suffering from a personality disorder

Living alone (especially if separated, divorced, or widowed)

Previous history of psychiatric treatment

Criminal record

Unemployment

Lower social class.

Relational pathology, for example an ongoing difficulty with her relationship with her boyfriend, is also a recognised factor for repeat suicide attempts. The fact that we do not know whether she has ongoing relationship problems means that we cannot class this as the strongest predictor of future suicidal intent.

Thus, the fact that she drove to an isolated area where there was little chance of her being found suggests that this is a serious attempt at suicide which predicts future suicidal intent.



[Q: 3766] OnExamination 2012 - Psychiatry

A 70-year-old woman had a major depressive disorder which was unresponsive to antidepressant medication.

Which one of the following statements is correct?

- 1- Associated dementia is unlikely
- 2- Electroconvulsive therapy (ECT) is likely to improve her mood
- 3- If she recovers, relapse is unlikely
- 4- The risk of suicide is low
- 5- Underlying physical illness is unlikely

Answer & Comments

Answer: 2- Electroconvulsive therapy (ECT) is likely to improve her mood

Depression in the elderly is a widespread problem that is often not diagnosed and frequently under-treated.

Depression can also be a sign of a medical problem. It may be complicated by brain disorders associated with the ageing process such as Alzheimer's disease.

Suicide risk in the elderly is an important consideration and is at least as common as in younger age groups. Relapse of depressive symptoms is common in the elderly.

ECT is indicated in patients who derive no benefit from antidepressant medication.



[Q: 3767] OnExamination 2012 - Psychiatry

A 30-year-old man is admitted to the psychiatric unit after abnormal behaviour in a police cell. He told police that there was a conspiracy against him and he began behaving irrationally.

Thirty six hours after admission to the psychiatric unit the patient has a grand-mal seizure.

Which of the following is the most likely cause of the seizure?

- 1- Amphetamine withdrawal
- 2- Hypercalcaemia
- 3- Idiopathic epilepsy
- 4- LSD withdrawal
- 5- Withdrawal from barbiturates

Answer & Comments

Answer: 5- Withdrawal from barbiturates

LSD withdrawal is not reported to cause seizures, and amphetamine withdrawal is

associated with depression, intense hunger and lethargy, but not with seizures.

There is nothing to suggest hypercalcaemia in this patient as the cause for fits but hyponatraemia associated with water intoxication following ecstasy abuse would be a possibility.

Barbiturate withdrawal in an habitual abuser is a well recognised cause of fits together with the altered behaviour.

It is unlikely, given the circumstances, that this is idiopathic epilepsy, although it remains a differential diagnosis.



[Q: 3768] OnExamination 2012 - Psychiatry

Which of the following statements concerning the causation and dynamics of schizophrenia is correct?

- 1- Decline in IQ scores during childhood may be a harbinger of psychotic symptoms in adults.
- 2- In monozygotic twins the risk of the second twin developing schizophrenia if the first is affected is of the order of 10%
- 3- Schizophrenia is commoner in higher socio-economic groups
- 4- Schizophrenia is commoner in individuals in unstable relationships
- 5- The lifetime risk of developing schizophrenia if one parent is affected is of the order of 50%

Answer & Comments

Answer: 4- Schizophrenia is commoner in individuals in unstable relationships

Schizophrenia occurs twice as often in unmarried and divorced people as in married or widowed individuals. Furthermore, people with schizophrenia are eight times more likely to be in the lowest socioeconomic groups.

These statistics are likely to reflect the alienating effects of this disease rather than any causal relationship or risk factor associated with poverty or a single life.

Nevertheless, low income and poverty may increase the risk for exposure to biological factors (for example, infections or toxins) or social stressors that could trigger the illness in susceptible people.

Monozygotic twins may have a 50% concordance and 10% of offspring may be affected suggesting strong inheritance.



[Q: 3769] OnExamination 2012 - Psychiatry

Which of the following features is most strongly suggestive of a diagnosis of somatisation disorder?

- 1- Below average intelligence
- 2- Male gender
- 3- Having a close relative with a physical illness
- 4- Many admissions to medical wards as an adult
- 5- Symptoms of a bizarre nature

Answer & Comments

Answer: 4- Many admissions to medical wards as an adult

Somatisation means the expression of psychological distress into bodily complaints for which medical help is sought.

Somatisation disorder is characterised by multiple, recurrent and changing symptoms for which no physical cause can be found. These typically last for over two years, and can be associated with multiple medical admissions. Patients refuse to accept advice or reassurance that no physical cause can be found. Functional impairment is common due to the nature of the symptoms and resultant behaviour. It affects women much more than

men, and is accompanied by a tendency to excessive drug use.

Common symptoms include gastrointestinal (belching, pain, vomiting, nausea), skin (burning, itching, tingling) and sexual and menstrual complaints. They are not usually bizarre.

There is no recognised link with IQ or a family history of disease.

Other forms of persistent somatisation include hypochondriasis, dysmorphophobia and psychogenic pain.



[Q: 3770] OnExamination 2012 - Psychiatry

Regarding puerperal psychosis which of the following statements is true?

- 1- Often takes the form of schizophrenia
- 2- Recurrence of puerperal psychosis in subsequent pregnancies is the rule
- 3- The onset is usually insidious
- 4- The prognosis is usually good
- 5- Usually begins after the second week of the puerperium

Answer & Comments

Answer: 4- The prognosis is usually good

Puerperal psychosis is a relatively rare complication of childbirth affecting 1 - 2 per 1000 births. (Postnatal depression is much commoner affecting 100 - 150 women per 1000 births).

Puerperal psychosis is a mood disorder with features of loss of contact with reality, hallucinations, thought disorder and abnormal behaviour. It usually presents rapidly in the first month but most often starts in the first week.

Prognosis is good.

Read more SIGN guideline 60.



[Q: 3771] OnExamination 2012 - Psychiatry

Which of the following is considered indicative of an abnormal grief reaction?

- 1- Adopting mannerisms of the deceased
- 2- Anger
- 3- Denial
- 4- Duration longer than 12 months
- 5- Hallucinations

Answer & Comments

Answer: 4- Duration longer than 12 months

Worden (1991) gives four headings for 'complicated grief reactions'

Chronic grief reactions

Delayed reactions

Exaggerated grief reactions and

Masked grief reactions.

There are huge variations between individuals and cultures and the question of what is normal and abnormal grief needs to be approached with sensitivity. In the west, six months is considered average for grief, most authorities would consider greater than 12 months abnormal.

Anger and denial have been identified by Kubler-Ross (1969) as part of her five 'stages' of normal grief (although even Kubler-Ross herself now states that the concept of a neat linear progression through grief is simplistic).

Hallucinations and adopting the deceased's mannerisms can occur in the early stages of grief and would not be considered abnormal on their own.



[Q: 3772] OnExamination 2012 - Psychiatry

A 63-year-old man was found collapsed.

A department of psychiatry outpatient card was found in his jacket, together with a bottle of procyclidine tablets.

He was febrile (38.2°C), conscious but unresponsive to commands. The blood pressure was 160/105 mmHg and there was marked muscle rigidity.

What is the most likely diagnosis?

- 1- Acute catatonic schizophrenia
- 2- Bacterial meningitis
- 3- Cerebral malaria
- 4- Neuroleptic malignant syndrome
- 5- Procyclidine overdose

Answer & Comments

Answer: 4- Neuroleptic malignant syndrome

The symptoms are typical of neuroleptic malignant syndrome (NMS).

NMS is characterised by:

Fever

Muscular rigidity

Altered mental status

Autonomic dysfunction.

Procyclidine is used to treat the Parkinsonian side effects of neuroleptics; its presence in the patient's pocket implies that he was taking neuroleptics.

Signs of procyclidine overdose include:

Agitation

Confusion

Sleeplessness lasting up to 24 hours or more

Pupils are dilated and unreactive to light.

Visual and auditory hallucinations and tachycardia have also been reported.

Further reading

Neuroleptic malignant syndrome information service



[Q: 3773] OnExamination 2012 - Psychiatry

A 34-year-old female presents with swallowing difficulties.

She says that she feels a "lump in her throat" that is worse in the morning. There is no associated pain and she had a steak sandwich for supper. Her family feels that she has lost weight since her partner left her eight months ago.

On meeting her you note sweaty palms and tremor. She has a BMI 22.

What is the most likely diagnosis?

- 1- Anorexia nervosa
- 2- Barrett's oesophagus
- 3- Globus hystericus
- 4- Hyperthyroidism
- 5- Pheochromocytoma

Answer & Comments

Answer: 3- Globus hystericus

Despite this woman's weight loss there is unlikely to be an organic cause, as she is able to swallow food boluses. There is no evidence of acid reflux to produce Barrett's oesophagus.

Hyperthyroidism may present with weight loss and a sensation of fullness in the throat, plus tachycardia and tremor. However the weight loss appears to be associated with a life change (stressor) and the "lump in her throat" alters throughout the day.

Anorexia nervosa is diagnosed when BMI is less than 17, there is altered body image and avoidance of food.

Phaeochromocytoma may give weight loss, sweating and tremor, however it would not give a strange sensation in the neck, and

there would be complaints of palpitations or anxiety with tachycardia.

Globus hystericus is part of the anxiety disorders and thought to be due to somatisation. In this case a stressor is the loss of her partner and this has led to anxiety symptoms and altered sensation in her neck.

This sensation is fluctuating and there is no mechanical problem. It is a diagnosis of exclusion and therefore it would be necessary to rule out some of the other mentioned diagnoses first.



[Q: 3774] OnExamination 2012 - Psychiatry

A 65-year-old gentleman presents with a two month history of memory impairment.

His wife has noticed that he often needs prompting for daily tasks and can be quite drowsy on some days. His memory fluctuates but is not necessarily better in the morning or evening. He has also started to act bizarrely, talking to himself and reaching out for things that do not appear to be there.

On examination he has cog-wheeling with a mask-like face and shuffling gait.

What is the most likely diagnosis?

- 1- Alzheimer's disease
- 2- Lewy body dementia
- 3- Normal pressure hydrocephalus
- 4- Parkinson's disease
- 5- Wilson's disease

Answer & Comments

Answer: 2- Lewy body dementia

Lewy body dementia is a mixture of Alzheimer's disease with Parkinson's disease.

Lewy body dementia is distinguished from dementia with Parkinson's by the time frame, as the cognitive impairment occurs within 12 months of Parkinsonism.

The main features are fluctuating cognition and alertness from hour to hour, visual hallucinations (usually of animal or human, and the patient may have insight into these hallucinations) and motor features of Parkinson's disease.

Wilson's disease is an autosomal recessive condition which causes build up of copper in the body. Copper accumulates in the liver and brain. This results in hepatitis, liver failure or cirrhosis. Accumulation in the brain can result in behavioural changes, depression, seizures, parkinsonism, however the initial sign is usually increased clumsiness.

This gentleman has change in cognition and hallucinations as well as being 65-years-old, making Wilson's less likely.

Parkinson's disease causes motor signs such as pill-rolling tremor, cog-wheel rigidity, shuffling gait, low voice, reduced arm swing and reduced expression (mask-like), as well as falls due to postural hypotension. Patients can develop memory impairment usually one year after motor symptoms.

Normal pressure hydrocephalus presents with urinary incontinence and urgency, gait disturbance (magnetic gait with reduced foot clearance, an increased preponderance to fall backwards and problems particularly with curbs) and dementia (frontal lobe characteristics).

Alzheimer's disease is dementia with loss of memory over a period of time, with behavioural changes often aggression, and withdrawal from social/family life. There is reduced attention, with language, problem solving and perception affected (MMSE important test). There are no motor signs.



[Q: 3775] OnExamination 2012 - Psychiatry

Which of the following might be a reason for someone to be judged to lack mental capacity using the functional test of capacity (for

example, as used by the Mental Capacity Act 2005)?

- 1- Contradicting previously expressed wishes
- 2- Inability to understand the relevant information
- 3- Irrational decision making
- 4- Loss of hearing aid
- 5- Presence of mental illness

Answer & Comments

Answer: 2- Inability to understand the relevant information

The Mental Capacity Act 2005 uses a functional test of capacity.

In the case of the MCA, the specific tests applied are that the individual must show an ability to

Understand and retain the relevant information

Weigh their options (and see the consequences of any choice)

Communicate their choice.

Although the Mental Capacity Act is specific to England and Wales, the functional test of capacity is used internationally and forms the basis for legislation in Scotland, USA and most English-speaking nations.

Whilst previously expressed wishes should be taken into account, these usually form part of a 'best interests' assessment, which occurs after capacity has been evaluated. The issue of previously expressed wishes would not be a determinant under functional tests of capacity, and mentally capacitated individuals have a right to contradict previously expressed wishes.

Using widely accepted criteria for the functional test of capacity, the answer is inability to understand the relevant information.

Irrational decision making is called the 'rational outcome' approach - it is not a functional test of capacity and is not used, for example, in the Mental Capacity Act as it is too subjective.

Although 'communicating choice' is a criterion in the MCA, loss of a hearing aid would not be considered a sufficiently good reason to judge lack of capacity. The onus is on the doctor to alleviate any remediable communication problem prior to assessing capacity.

Many functional tests of capacity have a 'diagnostic hurdle', that is, the presence of mental illness might be a reason to trigger a mental capacity assessment, but mental illness itself is no reason automatically to assume lack of capacity - this would be a 'status' test of capacity.



[Q: 3776] OnExamination 2012 - Psychiatry

Which of the following demographic factors is associated with a higher than normal risk of completed suicide?

- 1- Age below 35 years
- 2- Female sex
- 3- Marriage
- 4- Socio-economic group 1
- 5- Unemployment

Answer & Comments

Answer: 5- Unemployment

Deliberate self harm (DSH) is significantly more common than completed suicide.

For every 100 patients admitted to hospital following self harm, one will complete suicide within a year (Key topics in psychiatry 1996).

The demography and risk factors for deliberate self harm are often different from those for suicide.

Unemployment and low socio-economic groups are consistently associated with a higher risk of suicide than those with employment or in higher socio-economic groups.

Older males are considered at higher risk of completed suicide whilst younger women are considered the 'typical' profile for someone committing self harm (however DSH rates in younger men have risen considerably in recent years, closing the gap).

Marriage is one of the strongest protective factors against completed suicide, with men tending to benefit more than women.



[Q: 3777] OnExamination 2012 - Psychiatry

Which of the following is a biological feature of depression?

- 1- Derailment
- 2- Early morning waking
- 3- Low mood
- 4- Negativism
- 5- Thought block

Answer & Comments

Answer: 2- Early morning waking

Symptoms of depression include low mood, negative ideation including suicidality, biological symptoms and in severe cases, psychosis.

Biological symptoms include early morning waking, loss of appetite and libido, although many textbooks include poor concentration, anhedonia and easy fatigability as biological symptoms.

Biological symptoms are considered specific to depression but may lose specificity when a patient has symptoms of medical illness.

Derailment and thought block are forms of thought disorder associated with schizophrenia.

Negativism is a symptom of catatonia.

Only early morning waking is a biological feature of depression.



[Q: 3778] OnExamination 2012 - Psychiatry

A 25-year-old male is brought to casualty by his family.

He has become isolative, and is talking in a disorganised fashion. He complains that his thoughts are 'leaking' from his head and can be read by all.

What is the likely diagnosis?

- 1- Borderline (emotionally unstable) personality disorder
- 2- Delirium
- 3- Persistent delusional disorder
- 4- Psychotic depression
- 5- Schizophrenia

Answer & Comments

Answer: 5- Schizophrenia

The age and sex of the patient fits the demographic profile of schizophrenia. The symptom of thought broadcasting is one of Schneider's first rank symptoms, which are widely regarded as specific to schizophrenia. Therefore option E is the correct answer.

Option A, borderline personality disorder, may present with symptoms mimicking psychosis, for example, pseudo-hallucinations, but not thought broadcasting.

Options B, C and D may present with psychotic symptoms but not thought broadcasting.



[Q: 3779] OnExamination 2012 - Psychiatry

A 34-year-old woman comes to the clinic complaining of chronic fatigue. She has felt increasingly tired over the past few months, and just walking her children to school makes her so tired that she has to lie down for a rest for two to three hours. She has even had to give up her part time job selling cosmetics.

There have also been increasing headaches, and occasional palpitations.

Her only past medical history of note includes irritable bowel syndrome. On examination her BP is normal at 115/70 mmHg, pulse is 62 and regular and her BMI is 22 kg/m².

Cardiovascular, respiratory and abdominal examination is normal.

Investigations show

Haemoglobin 12.0 g/dl (11.5-16.0)

White cell count 5.6 x 10⁹/L (4-11)

Platelets 187 x 10⁹/L (150-400)

Serum Sodium 137 mmol/l (135-146)

Serum Potassium 4.2 mmol/l (3.5-5)

Creatinine 90 µmol/l (79-118)

Thyroid stimulating hormone 1.2 mu/l (0.5-5.0)

Glucose 5.0 mmol/l (4.5-5.6)

Calcium 2.3 mmol/l (2.20-2.67)

Which of the following is the most appropriate intervention?

- 1- Amitriptyline
- 2- Fluoxetine
- 3- Graded exercise therapy
- 4- Melatonin
- 5- Multi-vitamin replacement

Answer & Comments

Answer: 3- Graded exercise therapy

This woman is suffering from chronic fatigue syndrome as evidenced by her history, including:

Prolonged periods of rest after relatively minor exercise

Recurrent headaches

and normal physical examination and basic haematological and biochemical investigations.

There is little evidence to support the use of pharmacological therapies, although co-existent depression may be best managed with a non-sedating selective serotonin reuptake inhibitor (SSRI) such as fluoxetine, and sleep disorders with amitriptyline. Melatonin may be helpful in the paediatric population.

The best evidence for benefit in chronic fatigue syndrome comes from trials examining the use of graded exercise therapy, and as such should be considered in this case.



[Q: 3780] OnExamination 2012 - Psychiatry

A 27-year-old woman complained of palpitations, breathlessness and chest pain, radiating to the left arm.

These symptoms had developed six weeks previously, after she had witnessed her father dying from a myocardial infarction.

In the past 10 years she had been investigated for abdominal pain, headaches, joint pains, and dyspareunia, without serious cause being found for these symptoms.

What is the most likely diagnosis?

- 1- Depressive episode
- 2- Factitious disorder
- 3- Generalised anxiety disorder
- 4- Obsessive compulsive disorder
- 5- Somatisation disorder

Answer & Comments

Answer: 5- Somatisation disorder

Although the brief scenario does not have quite enough criteria to fulfil a diagnosis there is enough to make somatisation disorder the most likely answer.

Somatisation disorder is characterised by multiple recurring pains and gastrointestinal, sexual, and pseudo-neurologic symptoms that occur over a period of years.

To meet the diagnostic criteria for somatisation disorder, the patient's physical complaints must not be intentionally induced and must result in medical attention or significant impairment in social, occupational, or other important areas of functioning.

By definition, the first symptoms appear in adolescence and the full criteria are met by 30 years of age.

Of all the other disorders 'factitious disorder' would seem the least likely.

The other three are possible explanations but not as likely as somatisation.



[Q: 3781] OnExamination 2012 - Psychiatry

A 35-year-old man with a known history of acute intermittent porphyria because he carries a medical emergency card is brought to the Emergency department by the police; he has been violent with acute psychosis.

Which of the following sedatives would be the safest to use in this circumstance?

- 1- Chloral hydrate
- 2- Chlorpromazine
- 3- Diazepam
- 4- Haloperidol
- 5- Phenobarbitone

Answer & Comments

Answer: 2- Chlorpromazine

Phenothiazines have antiemetic and antipsychotic properties, making them the medication of choice for acute porphyria episodes.



[Q: 3782] OnExamination 2012 - Psychiatry

A 57-year-old man is admitted following a serious suicide attempt. He tries to leave hospital stating he is going to 'do the job properly'.

Under advice from your consultant, you use a section 5(2) holding power of the Mental Health Act (MHA) 2007 to detain him.

Which of the following is permitted in a section 5(2)?

- 1- Conversion to section 2 (assessment order) or 3 (treatment order) of the MHA 2007
- 2- Detention for 28 days
- 3- Leave if agreed with the responsible clinician
- 4- Transfer to a psychiatric hospital
- 5- Treatment with an antidepressant

Answer & Comments

Answer: 1- Conversion to section 2 (assessment order) or 3 (treatment order) of the MHA 2007

The MHA 2007 affects mainly England and Wales but other mental health acts in other countries have similar short term holding orders.

The purpose of the holding power is simply to keep an in-patient in hospital for the purpose of formal assessment, therefore formal assessment to a section 2 or 3 is not just permissible, it is strongly encouraged (option A).

As a holding order, the power of a 5(2) is limited - it does not allow any treatment, physical or psychiatric, that needs to be done under the Mental Capacity Act if the patient does not consent (option E).

An individual cannot be given leave or transferred either, unless there is a medical emergency (options C and D).

A 5(2) lasts a maximum of 72 hours (section 2 is for 28 days [option B]), but it would be considered bad practice for it to get to the maximum time limit without a formal assessment. (See MHA Code of Practice.)



[Q: 3783] OnExamination 2012 - Psychiatry

A 42-year-old man presented with confusion following a seizure.

He has a history of epilepsy and is also known to the community psychiatry team.

Examination reveals that he has a temperature of 37°C, BP 138/84 mmHG, coarse tremor and a pulse of 90 bpm.

Which of the following is the most likely underlying diagnosis?

- 1- Benzodiazepine overdose
- 2- Carbamazepine toxicity
- 3- Lithium toxicity
- 4- Neuroleptic malignant syndrome
- 5- Tricyclic overdose

Answer & Comments

Answer: 3- Lithium toxicity

The tremor, seizure and confusion should raise the possibility of lithium toxicity which is the condition that best fits this clinical picture.

eMedicine: Lithium toxicity



[Q: 3784] OnExamination 2012 - Psychiatry

A 67-year-old man is referred as an emergency by his general practitioner.

The night before he attempted to smother his wife whilst he was fast asleep. The following day, whilst oblivious to the potentially dangerous situation, he reports remembering dreaming about fighting a bear. His father had experienced a similar event some years before being diagnosed with Parkinson's disease.

Which of the following is the most likely diagnosis?

- 1- Adult attention deficit hyperactivity disorder (ADHD)
- 2- Lewy body dementia
- 3- Night terrors
- 4- REM sleep behaviour disorder
- 5- Schizophrenia

Answer & Comments

Answer: 4- REM sleep behaviour disorder

Rapid eye movement (REM) sleep behaviour disorder, often associated with the violent re-enacting of dreams, occurs when the normal atonicity of REM sleep is lost.

There is an association with the later development of movement disorders and these can be predicted by a number of years.

Making the situation safe is paramount but treatment with clonazepam is the intervention of choice.



[Q: 3785] OnExamination 2012 - Psychiatry

An 82-year-old male with longstanding Alzheimer's dementia presents as his carers are concerned about his increased episodes of aggression. Physically he is well.

Which is the most appropriate treatment for his aggressive outbursts?

- 1- Diazepam
- 2- Quetiapine
- 3- Risperidone
- 4- Temazepam
- 5- Valproate

Answer & Comments

Answer: 2- Quetiapine

Risperidone used to be a favourite treatment for aggression/agitation in dementia but recent studies indicate that it is associated with an increased mortality and a threefold increased risk of stroke.

Valproate is widely used for its calming effects in this situation but although widely used there is little evidence of the efficacy of valproate.

Valproic acid for agitation in dementia
Cochrane Database Syst Rev. 2004;(2):CD003945

Haloperidol may be associated with cardiac arrhythmias, and its use is now discouraged for long term use.

The other options are associated with more prominent adverse effects.



[Q: 3786] OnExamination 2012 - Psychiatry

A 27-year-old female presents with persistent fatigue, myalgia, poor concentration and irritability following a flu-like illness 18 months previously.

A diagnosis of chronic fatigue syndrome (CFS) is made.

What is the appropriate initial management of this patient?

- 1- Antidepressants
- 2- Cognitive behavioural therapy

- 3- ECT
- 4- Psychoanalysis
- 5- Reversion therapy

Answer & Comments

Answer: 2- Cognitive behavioural therapy

In general, in order to receive a diagnosis of chronic fatigue syndrome, a patient must satisfy two criteria:

Have severe chronic fatigue of six months or longer duration with other known medical conditions excluded by clinical diagnosis.

Concurrently have four or more of the following symptoms:

Substantial impairment in short term memory or concentration

Sore throat

Tender lymph nodes

Muscle pain

Multi-joint pain without swelling or redness

Headaches of a new type pattern or severity

Unrefreshing sleep

Post-exertional malaise lasting more than 24 hours.

(source CDC).

There is a RCP report on CFS from 1996.

Low dose antidepressants are used in the treatment of CFS, but the suggested first line therapy should include cognitive behavioural therapy, if access to this service is available.



[Q: 3787] OnExamination 2012 - Psychiatry

An 18-year-old woman presented with a history of 15 kg weight loss in the previous four months. She has been amenorrhoeic for some months.

On examination she had fine lanugo hair and a blood pressure of 110/60 mmHg.

Which one of the following laboratory results would support the most likely clinical diagnosis?

- 1- High plasma follicle stimulating hormone (FSH) concentration
- 2- High serum ferritin concentration
- 3- Low plasma cortisol concentration
- 4- Low plasma testosterone concentration
- 5- Suppressed thyroid stimulating hormone (TSH) concentration

Answer & Comments

Answer: 5- Suppressed thyroid stimulating hormone (TSH) concentration

The question alludes to a patient with anorexia nervosa.

Anorexia is associated with functional hypogonadotrophic hypogonadism with low FSH and luteinising hormone (LH) levels.

Cortisol levels may be increased but are typically within the 'normal range'. They may however, may fail to suppress with dexamethasone.

Plasma testosterone levels are normal in females with anorexia.

Basal levels of TSH may be depressed in anorexia, though T4 and T3 may be normal.

Ferritin levels are low in a state of malnutrition.



[Q: 3788] OnExamination 2012 - Psychiatry

A 28-year old man complained of voices which told him to self-harm.

He was unemployed, having dropped out of university two years previously.

Dependence on which of the following is the most likely cause?

- 1- Alcohol
- 2- Amphetamines
- 3- Benzodiazepines
- 4- Gamma-hydroxybutyrate (GHB)
- 5- Opiates

Answer & Comments

Answer: 2- Amphetamines

The question suggests that the patient is suffering from actions experienced as made or influenced by external agents, a Schneider's first rank symptom.

Amphetamines are known to lead to drug induced schizophrenia.

Benzodiazepines are not known to induce schizophrenia, but there are reports of auditory hallucinations on benzodiazepine withdrawal.

GHB is not associated with drug induced schizophrenia; opiates may be associated with hallucinations, but not Schneider's first rank symptoms.

One must be aware of the potential dual-diagnosis scenario; that is the patient who is dependent on a drug, but who also has schizophrenia, which may have been precipitated by drug-use or stress, but which is not drug-induced per se.



[Q: 3789] OnExamination 2012 - Psychiatry

A 50-year-old business man who has been drinking heavily for at least two years, states that he drinks alcohol on his way into work as he suffers from anxiety attacks.

Which one of the following statements is true regarding these episodes?

- 1- They are imagined
- 2- They are not accompanied by tremor
- 3- They are still present after drinking

- 4- They will deteriorate after three weeks of abstinence from alcohol
- 5- They will improve after three weeks of abstinence from alcohol

Answer & Comments

Answer: 5- They will improve after three weeks of abstinence from alcohol

This patient has anxiety symptoms due to withdrawal from alcohol.

The typical symptoms include agitation, fever, sweats and tremor which are relieved by alcohol. These symptoms usually peak after about 72 hours and may last a week or more but should have improved after three weeks.



[Q: 3790] OnExamination 2012 - Psychiatry

With respect to symptoms of withdrawal related to chronic alcohol use, which of the following statements is correct?

- 1- Benzodiazepines are ineffective in the treatment of seizures secondary to alcohol withdrawal, due to cross tolerance with ethanol a type A gamma-aminobutyric acid receptor
- 2- Carbamazepine is as effective as benzodiazepines in the acute treatment of the symptoms of alcohol withdrawal
- 3- Phenytoin is an effective treatment for seizures related to alcohol withdrawal
- 4- Withdrawal reflects enhanced neurotransmission in type A gamma-aminobutyric acid pathways
- 5- Withdrawal reflects reduced neurotransmission in N-methyl-D-aspartate pathways

Answer & Comments

Answer: 2- Carbamazepine is as effective as benzodiazepines in the acute treatment of the symptoms of alcohol withdrawal

Carbamazepine at a starting dose of 800 mg per 24 hours has been shown to be as effective as oxazepam in the treatment of acute alcohol withdrawal.

Phenytoin is not effective in the treatment of alcohol withdrawal-related seizures.

Alcohol withdrawal reflects the damping of neurotransmission through type A gamma-aminobutyric pathways, and enhanced neurotransmission through N-methyl-D-aspartate pathways.



[Q: 3791] OnExamination 2012 - Psychiatry

A patient on the ward is diagnosed with schizophrenia.

You are asked to speak with the mother and father of the patient. They ask you about prognostic features of schizophrenia.

Which of the following features of their son's illness, character, and lifestyle, which they raise are poor prognostic indicators in schizophrenia?

- 1- A precipitating cause
- 2- High intelligence
- 3- Strong family history
- 4- Sudden onset of symptoms
- 5- Unstable social background

Answer & Comments

Answer: 3- Strong family history

Unstable social background predisposes, but does not confer poor prognosis in schizophrenia.

A strong family history is related to prognosis in schizophrenia.

Insidious onset confers a poor prognosis, and a precipitating cause and high intelligence are favourable prognostic indicators.



[Q: 3792] OnExamination 2012 - Psychiatry

You are asked to consent a patient for electroconvulsive therapy (ECT).

Which of the following is not a hazard of ECT?

- 1- Amnesia
- 2- Crush fracture of the vertebral bodies
- 3- Induction of cardiac arrhythmia
- 4- Induction of dementia
- 5- Memory loss

Answer & Comments

Answer: 4- Induction of dementia

Side effects of ECT are rare.

Over the course of ECT, it may be more difficult for patients to remember newly learned information, though this difficulty disappears over the days and weeks following completion of the ECT course.

Some patients also report a partial loss of memory for events that occurred during the days, weeks, and months preceding ECT. While most of these memories typically return over a period of days to months following ECT, some patients report longer lasting problems with recall of these memories.

Other individuals report improved memory ability following ECT, because of its ability to remove the amnesia sometimes associated with severe depression.

Cardiac arrhythmia may be stimulated by the electrical shock of ECT.

Musculoskeletal injury has been reported after ECT, but with adequate anaesthetisation, this is rare.

Dementia is an organic illness which is not induced by ECT.



[Q: 3793] OnExamination 2012 - Psychiatry

A 45-year-old woman presents with polydipsia and polyuria. She says that she is having difficulty sleeping as she is constantly thirsty, drinking many glasses of water during the day, and passing urine excessively at night.

She has a history of anxiety and depression and is currently managed with fluoxetine to control her symptoms. She also has a history of mild hypertension, which is controlled with ramipril 5 mg.

On examination her BP is 135/70 mmHg, and a general physical examination is normal.

Investigations show

Hb 13.1 g/dl (11.5-16.5)

WCC $5.6 \times 10^9/L$ (4-11)

PLT $203 \times 10^9/L$ (150-400)

Na 134 mmol/l (135-146)

K 4.0 mmol/l (3.5-5)

Cr 90 $\mu\text{mol/l}$ (79-118)

Glucose 5.6 mmol/l (4.5-5.6)

Ca 2.2 mmol/l (2.2-2.67)

Plasma osmolality 275 mOsm/l (282-295)

Which of the following is the most likely diagnosis?

- 1- Cranial diabetes insipidus
- 2- Hyperglycaemia-related polyuria
- 3- Nephrogenic diabetes insipidus
- 4- Psychogenic polydipsia
- 5- Syndrome of inappropriate antidiuretic hormone hypersecretion (SIADH)

Answer & Comments

Answer: 4- Psychogenic polydipsia

This patient has a previous history of anxiety and depression and has been prescribed

fluoxetine, which may invoke SIADH, but there is no evidence of that here.

The low sodium seen is likely to result from water overload due to excess fluid intake. Her glucose and calcium are not in the range to precipitate thirst and polyuria.

In this case, cognitive therapy is likely to have the greatest impact on her symptoms.



[Q: 3794] OnExamination 2012 - Psychiatry

A 50-year-old woman presents with multiple recurrent and frequently changing symptoms that are 'functional' in nature (somatisation disorder).

Which of the following statements concerning her management is correct?

- 1- Antidepressant medication is unlikely to help
- 2- An understanding of her early childhood experiences is necessary
- 3- Her progress will be slower if she thinks her doctors do not believe her
- 4- Medical staff need to minimise their contact with her relatives
- 5- She should be persuaded to understand that her symptoms are psychological

Answer & Comments

Answer: 3- Her progress will be slower if she thinks her doctors do not believe her

This is quite a tough question. The College has asked about somatisation disorder in at least four recent examinations so they must think it is quite important.

Knowledge of early childhood experiences is not necessary

Depression is often found so antidepressives are useful

Relatives should be involved and

Empathy, not persuasion, is the key to management.



[Q: 3795] OnExamination 2012 - Psychiatry

A 24-year-old male presents with shortness of breath, chest pains and cough.

He is a smoker of 10 pack/years and occasionally uses cocaine and ketamine.

He uses PRN salbutamol inhaler for asthma diagnosed in childhood. He has been treated by his GP for chest infections four times in the past seven months, with different courses of antibiotics.

On examination he has a white exudate on his tongue and throat. His examination is otherwise normal. The nursing staff tells you that his saturations drop to 74% on room air when walking to the bathroom.

What test will confirm your diagnosis?

- 1- Chest x ray
- 2- ECG
- 3- Peak expiratory flow
- 4- Sputum culture
- 5- Sputum immunofluorescence

Answer & Comments

Answer: 5- Sputum immunofluorescence

This gentleman has candidiasis of his throat that may be due to his inhaler usage but given his other symptoms and history may well be secondary to HIV infection.

He has recurrent chest infections and now symptoms compatible with PCP infection (dry cough, chest pains, desaturation on exertion, normal chest examination).

The only test that will confirm this is sputum immunofluorescence. Severe cases should be treated with steroids in addition to co-trimoxazole or pentamidine.

Chest x ray classically shows perihilar interstitial shadowing, but this can occur with other infections and therefore is not conclusive evidence.

ECG will be unremarkable.

Peak expiratory flow (PEF) may show reduction in his ability due to exacerbation of asthma in the presence of infection, but again it is not a diagnostic test.

A straightforward sputum culture will not diagnose *Pneumocystis carinii*.



[Q: 3796] OnExamination 2012 - Psychiatry

A 27-year-old woman is suffering with headaches that have occurred daily for the past three months.

They occur at different times of the day and affect the frontal and occipital areas. She has no neck stiffness or rash. She does not have any visual symptoms.

She has noticed cramps and tingling in her lips and fingers associated with palpitations and a feeling of suffocation. She takes no medication.

She is concerned because her father died from glioblastoma 12 months ago.

What is the likely cause of her headaches?

- 1- Anxiety neurosis
- 2- Benign intracranial hypertension
- 3- Glioblastoma
- 4- Nelson's syndrome
- 5- Neurosarcoidosis

Answer & Comments

Answer: 1- Anxiety neurosis

This lady's symptoms do not have any 'red flags' so it is unlikely to be organic in cause.

Benign intracranial hypertension (BIH) and glioblastoma would give her a headache that

worsened with coughing or sneezing and might be associated with visual symptoms.

Neurosarcoidosis can present with nerve palsies, deficiencies of the pituitary function or character changes/psychosis. This lady does not have any other symptoms pointing towards sarcoid.

Nelson's syndrome is pituitary enlargement following adrenalectomy for Addison's disease.

This lady's symptoms fit with an anxiety neurosis. She has symptoms of anxiety, headache, hyperventilation (tetany and tingling) and palpitations, related to the stressor of her father's death.



[Q: 3797] OnExamination 2012 - Psychiatry

A 70-year-old man with vascular dementia is recuperating on the stroke rehabilitation ward after a middle cerebral artery infarct.

Despite several conversations he does not realise he is in hospital but is usually settled, accepts medication and is not on any neuroleptics; however on two nights in the last week he has tried to leave the ward at night, having to be forcibly returned. His doctors and nurses agree his rehabilitation is in his best interests, although likely to take weeks.

What is the best medico-legal framework for his management?

- 1- Common law
- 2- DOLS (deprivation of liberty safeguarding)
- 3- Mental Capacity Act
- 4- Mental Health Act
- 5- Nothing - he should be allowed to leave

Answer & Comments

Answer: 2- DOLS (deprivation of liberty safeguarding)

DOLS assessments require a doctor approved under the Mental Health Act and a best interest assessor to ascertain whether

The patient is over the age of 18

Has a mental illness as defined under the Mental Health Act

Lacks capacity

Is being detained in his or her best interests and that

The DOLS order will not conflict with a pre-existing arrangement under either the MHA or MCA.

The Mental Capacity Act (option C) has now superseded common law (option A); both allow treatment of a mentally incapacitated adult in emergency circumstances, where such treatment is in their best interests.

However the emergency powers of the MCA are designed only for short term crises, one of the reasons DOLS was introduced.

The Mental Health Act (option D) is designed primarily to enforce psychiatric treatment and is neither necessary nor sufficient for his physical medical treatment.

However the DOLS legislation (option B), which has been added to the MCA, is designed for exactly such a situation, that is, a mentally incapacitated adult whose consent to remain is dubious.

E is not an option - you have a duty of care to vulnerable patients, and a court of law would take a dim view of any doctor who allowed such a patient to put himself at risk.



[Q: 3798] OnExamination 2012 - Psychiatry

You see a 45-year-old man in clinic with symptoms of akathisia from his antipsychotic medication.

You discuss reducing his antipsychotic but he insists that every time medication is reduced

below the current dosage his delusions get much worse.

What would be your next best therapeutic manoeuvre?

- 1- Antimuscarinic (for example, procyclidine)
- 2- Benzodiazepine (for example, clonazepam)
- 3- Beta-blocker
- 4- Dopamine agonist (for example, pramipexole)
- 5- Vitamin E

Answer & Comments

Answer: 2- Benzodiazepine (for example, clonazepam)

This man suffers from akathisia, a well-documented side effect of dopamine blockade.

According to a Cochrane review (Oct 1999), benzodiazepines (traditionally clonazepam) have the best research evidence in combating this unpleasant side effect.

B-blockers, (option C) are often recommended but according to a 2004 Cochrane review, there is insufficient evidence to support their use.

Antimuscarinics (option A) are often prescribed, mainly because they are used for other motor side effects of dopamine blockade but again a Cochrane review (Oct 2006) concluded the evidence was poor and there are in fact case reports of antimuscarinics worsening symptoms.

There is no firm evidence to support the use of pramipexole (option D) and akathisia is listed as a side effect, so it cannot be recommended. Pramipexole is licensed for the treatment of restless legs syndrome, a condition superficially similar to akathisia.

Finally vitamin E (option E) is often recommended in the treatment of early

tardive dyskinesia (although evidence of efficacy is mixed).



[Q: 3799] OnExamination 2012 - Psychiatry

You are asked to review a 35-year-old man who was transferred from a psychiatric ward a week ago with unexplained pyrexia.

Nurses say he is deteriorating: on examination he has reduced conscious level, a temperature of 38.5°C, BP 90/ 50 mmHg, pulse 110 bpm. There is generalised muscle stiffness but no neck stiffness and no focal neurology.

Basic screening bloods in casualty show mild leucocytosis and dehydration with CRP 50. The rest of the FBC and biochemistry including liver function tests are essentially normal. Infection screen - including CXR, mid-stream urine (MSU) and blood cultures - is negative.

Which of the following would be the best investigation to perform next?

- 1- Brain CT (computerised tomography)
- 2- Creatine kinase (CK)
- 3- Lumbar puncture
- 4- Repeat blood culture
- 5- Sputum m, c and s (microscopy, culture and sensitivity)

Answer & Comments

Answer: 2- Creatine kinase (CK)

The history is strongly suggestive of neuroleptic malignant syndrome. This is an idiopathic drug reaction associated with initiation or adjustment of neuroleptic medication, particularly dopamine blockers such as antipsychotics. Primary diagnostic features are altered conscious level, autonomic instability and muscular rigidity with raised creatine kinase (CK).

A CK level (option B) can give an answer within a matter of hours: given the history of muscular rigidity, it should be the next investigation.

Options C to E are reasonable investigations in the situation but will all take time, it would be hard to justify their priority over a simple test like a CK.

A CT (option A) is unlikely to give a useful answer in the absence of focal neurology.



[Q: 3800] OnExamination 2012 - Psychiatry

Which of the following is the most useful imaging modality of the brain when investigating Lewy body dementia?

- 1- CT
- 2- DaTscan™ (dopamine transporter scan)
- 3- HMPAO PET
- 4- MRI
- 5- Skull x ray

Answer & Comments

Answer: 2- DaTscan™ (dopamine transporter scan)

Conventional imaging is used mainly to rule out other causes of cognitive impairment.

Alzheimer's disease may show as atrophy (medial temporal atrophy is considered most characteristic of Alzheimer's). Vascular dementia may show as scattered ischaemia. Both these changes are more easily detected on MRI than CT. Lewy body dementia (LBD) is poorly served by conventional imaging.

DaTscan™, (option B), uses radio ligands to bind to dopamine receptors in the brain. The sensitivity of the DaTscan for the diagnosis of DLB is 88% and specificity is 100 % (Walker et al 2007). Its main drawback is expense.

Lewy body dementia has no specific identifying features on CT (option A) or MRI (option D).

Some studies suggest HMPAO PET can be used to distinguish between LBD and other dementias but it is not as specific as DaTscan.

Skull x ray (option E) cannot show the soft tissues of the brain and has little value in diagnosing any dementia.



[Q: 3801] OnExamination 2012 - Psychiatry

A 24-year-old man is admitted to the Emergency department via the police. He was found trying to kick in the windows of a local department store.

His flatmates tell you that he has been acting increasingly strangely over the past few weeks, and has covered the inside of his room with silver paper.

On examination he looks agitated, his BP is 155/80 mmHg, and his pulse is 90. He tells you to stop the voices in the room from commenting on his actions and his personality.

Investigations show

Hb 12.9 g/dl(13.5-18)

WCC $6.7 \times 10^9/L$ (4-11)

PLT $256 \times 10^9/L$ (150-400)

Na 139 mmol/l (135-146)

K 4.5 mmol/l (3.5-5)

Cr 120 mmol/l (79-118)

Urine Positive for cannabinoids

Which of the following is the most likely diagnosis?

- 1- Drug-induced psychosis
- 2- Encephalitis
- 3- Hypomania
- 4- Personality disorder
- 5- Schizophrenia

Answer & Comments

Answer: 5- Schizophrenia

This patient is displaying a number of the 'first-rank' symptoms of schizophrenia. For the purpose of the MRCP examination these are considered diagnostic of schizophrenia.

In this case the patient has third person auditory hallucinations with running commentary. Covering his room with silver paper may be an attempt to stop thought broadcasting.

The presence of urinary cannaboids may make you think about drug-induced psychosis. However the presence of first-rank symptoms precludes this diagnosis. In addition, cannabis has been linked with the development of schizophrenia, and cannabis may be used by patients suffering from schizophrenia to self-medicate.

The first-rank symptoms also make encephalitis, hypomania and personality disorder unlikely.

For treatment of acute psychosis, haloperidol or a rapidly dissolving formulation of olanzapine may be of value. Other atypical antipsychotics such as risperidone are usually used for maintenance treatment.



[Q: 3802] OnExamination 2012 - Psychiatry

A 72-year-old man presents to the Emergency department. He has an unshakable belief that he has stomach cancer and has taken an overdose of paracetamol tablets after making a decision to end it all.

He has been off his food for the past six months, having lost 6 kg. He is finding it difficult to fall asleep and wakes in the early hours of the morning at about 4 am. He sees nothing positive in his current situation and has lost all interest in work.

On examination he looks unkempt, has clearly not washed or shaved for many days.

Investigations show:

Haemoglobin 13.1 g/dl(13.5-18)

White cell count $7.2 \times 10^9/L$ (4-10)

Platelets $203 \times 10^9/L$ (150-400)

Sodium 141 mmol/l (134-143)

Potassium 4.7 mmol/l (3.5-5)

Creatinine 99 $\mu\text{mol/l}$ (60-120)

ESR 5 (<10)

Which of the following is the most likely diagnosis?

- 1- Carcinoma of the stomach
- 2- Depression
- 3- Hypomania
- 4- Personality disorder
- 5- Schizophrenia

Answer & Comments

Answer: 2- Depression

This man shows:

Depressed mood

No interest or pleasure

Weight loss

Early morning waking.

This all fits with an episode of major depression, the delusion that he has stomach cancer being consistent with this picture.

He has a normal full blood count and an ESR just outside the normal range. This makes actual underlying carcinoma of the stomach unlikely.

After initial treatment of his paracetamol overdose, medication for his depression should take into account risk of future overdose.

Tricyclic anti-depressants are likely to carry significantly more risk than selective

serotonin reuptake inhibitors (SSRIs) in overdose.



[Q: 3803] OnExamination 2012 - Psychiatry

A 21-year-old history student has returned to university after a field trip to the US. His girlfriend has called the student health service as he has begun dressing in ceremonial robes and has announced to her that he is the dean of the faculty and orders her to wait on his every need.

He has been known to use cannabis in the past and has used ecstasy on several other occasions. Additionally, he has been using some caffeine tablets to help him stay up at night to prepare an essay for submission and has been suffering from worsening headaches over the past few weeks.

The student health service persuades him to come in for an urgent appointment, where on examination, he is wearing a very bright shirt and trousers, and a black academic robe and mortar board hat. His BP is 112/70 mmHg, his pulse is 80 and regular.

Physical examination is unremarkable but you identify both pressure of speech and flight of ideas on mental state examination.

Investigations show

Haemoglobin 13.1 g/dl (13.5-8)

White cell count $6.1 \times 10^9/L$ (4-10)

Platelets $209 \times 10^9/L$ (150-400)

Sodium 142 mmol/l (134-143)

Potassium 4.6 mmol/l (3.5-5)

Creatinine 110 $\mu\text{mol/l}$ (60-120)

Which of the following is the most likely diagnosis?

- 1- Drug induced psychosis
- 2- Intracerebral mass lesion
- 3- Mania
- 4- Personality disorder

5- Schizophrenia

Answer & Comments

Answer: 3- Mania

This man's grandiose delusions, flight of ideas and pressure of speech fit best with a diagnosis of mania. The headaches and illicit drug use are distractors from the most likely diagnosis.

The objective is to control this patient's symptoms rapidly, and ensure safety for both himself and his partner.

Treatment options include:

Mood stabilisers such as:

Lithium

Sodium valproate

Carbamazepine

Atypical anti-psychotics, such as risperidone

Benzodiazepines.



[Q: 3804] OnExamination 2012 - Psychiatry

A 52-year-old male is admitted after taking an overdose.

Which single feature best suggests a high risk of future suicide?

- 1- Ingestion of alcohol with the overdose drug
- 2- Ingestion of more than one drug
- 3- Ingestion of more than 100 tablets
- 4- Making plans before the overdose to avoid discovery
- 5- Previous history of overdose

Answer & Comments

Answer: 4- Making plans before the overdose to avoid discovery

The effort to conceal the overdose suggests a serious intent to commit suicide, more so than the other options given.

Previous history of overdoses (rather than parasuicide - as we do not know exactly what was taken, he could have taken an overdose of cod liver oil) does not necessarily imply a more serious intent.

Other factors that would imply a more sinister intent would be male, elderly with mental illness.



[Q: 3805] OnExamination 2012 - Psychiatry

Which of the following is a typical side effect of olanzapine?

- 1- Akathisia
- 2- Hypoadrenalism
- 3- Hypoglycaemia
- 4- Macroglossia
- 5- Steven-Johnson syndrome

Answer & Comments

Answer: 1- Akathisia

Akathisia is a typical side effect associated with the use of the atypical antipsychotic olanzapine.

Others include

Agranulocytosis

Hyperprolactinaemia

Hyperglycaemia

Depression

Anxiety.



[Q: 3806] OnExamination 2012 - Psychiatry

A 22-year-old man consults his GP complaining of redness and itching on his face

and hands.

He has regularly visited another GP for similar complaints within the last two years and has been signed off on sick leave from employment as a builder. He is in receipt of benefits and reports that he is in the process of making an insurance claim for loss of earnings.

He says that there was one ointment that cured the problem but he had not been able to find any proprietary medication that works. Examination showed no skin lesions and no apparent rash.

What is the most likely diagnosis?

- 1- Conversion disorder
- 2- Delusional disorder
- 3- Malingering
- 4- Munchausen syndrome
- 5- Obsessive compulsive disorder

Answer & Comments

Answer: 3- Malingering

In somatoform disorders, both illness production and motivation are unconscious drives.

In malingering, as suggested here, the patient consciously fakes or claims to have a disorder in order to attain a specific gain (for example, financial).

Munchausen syndrome is manifested by a chronic history of multiple hospital admissions and willingness to receive invasive procedures.



[Q: 3807] OnExamination 2012 - Psychiatry

A 45-year-old woman has, approximately four hours ago, taken an unknown quantity of amitriptyline tablets that were being prescribed for her depression. She is feeling drowsy, agitated and has a dry mouth.

An ECG shows wide QRS complexes with arrhythmias.

Blood gas analysis revealed:

pH 7.2 (7.36-7.44)

paO₂ 10 kPa(11.3-12.6)

paCO₂ 4 kPa(4.7-6.0)

What is the most appropriate treatment?

- 1- Activated charcoal
- 2- Gastric lavage
- 3- Haemodialysis
- 4- Intravenous insulin
- 5- Intravenous sodium bicarbonate

Answer & Comments

Answer: 5- Intravenous sodium bicarbonate

There is no specific treatment for tricyclic antidepressant poisoning.

500 ml of 1.26% sodium bicarbonate should be used to treat arrhythmias, hypotension and significant ECG abnormalities to a pH of 7.50-7.55 in tricyclic antidepressant overdose, even in the absence of acidosis.



[Q: 3808] OnExamination 2012 - Psychiatry

A 41-year-old female is brought into the Emergency department after taking an uncertain quantity of paracetamol two hours previously and trying to hang herself.

She becomes agitated and insists that she wants to go home immediately. You judge that she is at high risk of suicide.

Which of the following is the most appropriate course of action for this patient?

- 1- Ask her to sign a 'discharge against medical advice' form and let her go
- 2- Call the duty psychiatrist, and with other staff in the emergency department attempt to restrain her under common law until they arrive

- 3- Call the duty psychiatrist, but let the patient go if she insists and the duty psychiatrist does not arrive in time to see her
- 4- Call the hospital security services, restrain her and sedate her
- 5- Detain her under section 5(2) of the Mental Health Act

Answer & Comments

Answer: 2- Call the duty psychiatrist, and with other staff in the emergency department attempt to restrain her under common law until they arrive

In an Emergency department the suicidal patient who declines to be admitted for observation and treatment should be managed as follows:

Ensure that a member of staff stays with them at all times

Call the duty psychiatrist if they attempt to abscond before or during psychiatric assessment.

The staff of the Emergency department have a duty under common law to restrain the patient.

If a patient who is already being nursed on a medical, surgical or obstetric ward, or in a high dependency or intensive care unit, develops a mental illness (or has an exacerbation of a pre-existing disorder), their physician or surgeon can authorise their compulsory detention for up to 72 hours under section 5(2) of the Mental Health Act.



[Q: 3809] OnExamination 2012 - Psychiatry

A 81-year-old male presents with difficulty coping at home and is found to be depressed.

Which one of the following statements regarding this patient is correct?

- 1- Electroconvulsive therapy (ECT) would be contraindicated if he had a previous cerebrovascular accident
- 2- He is unlikely to have had previous episodes of depression
- 3- Monoamine oxidase inhibitors are the most appropriate treatment for this patient
- 4- Somatic symptoms would be an unexpected feature
- 5- Suicide would be unlikely in a patient of this age

Answer & Comments

Answer: 1- Electroconvulsive therapy (ECT) would be contraindicated if he had a previous cerebrovascular accident

ECT may result in seizures, cerebral ischaemia and cardiac arrhythmias.

In the elderly confusion and falls may also occur.

Somatic complaints and previous depressive illness are common.

Suicide rates in males of this age group are significantly above the national average.

Monoamine oxidase (MAO) inhibitors are not the drugs of choice in the elderly due to the risk of side effects including severe hypertension.



[Q: 3810] OnExamination 2012 - Psychiatry

A 76-year-old male attends clinic with his wife who states that her husband has become disinterested and withdrawn.

Which of the following would favour a diagnosis of dementia rather than depression?

- 1- Agitation
- 2- Poor short term memory

- 3- Reduced libido
- 4- Self-reported concern of poor memory
- 5- Urinary incontinence

Answer & Comments

Answer: 5- Urinary incontinence

Urinary incontinence would be particularly unusual in association with a depressive episode and would be far more typical of dementia. Almost invariably a patient with dementia will develop incontinence as the disease progresses. This is not due to urinary tract pathology, but more due to impaired mobility, reduced manual dexterity, mental capacity and motivation. All these factors combine to make continence incredibly difficult.

The other symptoms may be found in dementia, particularly impaired memory and concern over memory deficits.



[Q: 3811] OnExamination 2012 - Psychiatry

A 40-year-old ex-footballer presents requesting treatment for alcoholism and is prescribed disulfiram.

What is the mode of action of disulfiram?

- 1- Decreases severity of alcohol withdrawal
- 2- Helps alcoholics to drink safely
- 3- Inhibits acetaldehyde dehydrogenase activity
- 4- Inhibits alcohol dehydrogenase activity
- 5- Reduces the desire for alcohol

Answer & Comments

Answer: 3- Inhibits acetaldehyde dehydrogenase activity

Alcohol is mainly metabolised in the liver to acetaldehyde by alcohol dehydrogenase.

Acetaldehyde is then oxidised to acetate by acetaldehyde dehydrogenase (AcDH).

Disulfiram irreversibly inhibits the oxidation of acetaldehyde by competing with the cofactor nicotinamide adenine dinucleotide (NAD) for binding sites on AcDH.

The increased acetaldehyde levels are thought to produce the unpleasant side effects associated with acetaldehyde syndrome such as headaches, nausea, flushing, etc.



[Q: 3812] OnExamination 2012 - Psychiatry

All of the following lead to the increased risk of developing schizophrenia or a schizophrenic-like illness, except which?

- 1- Amphetamine addiction
- 2- Being brought up in an institution
- 3- Sibling with schizophrenia
- 4- Social Class V
- 5- Temporal lobe epilepsy

Answer & Comments

Answer: 2- Being brought up in an institution

Nurture in an institution does not predispose individuals to schizophrenia.

Schizophrenia is however more common in social classes IV and V.

The lifetime risk of developing schizophrenia in the UK is 1%. If there is an affected sibling the risk increases to 8-10%.

Temporal lobe epilepsy may cause hallucinations mimicking schizophrenia, and amphetamines may cause a state resembling hyperactive paranoid schizophrenia with hallucinations.



[Q: 3813] OnExamination 2012 - Psychiatry

A 21-year-old woman is known to suffer from anorexia nervosa.

Which of the following metabolic disturbances would be a characteristic finding?

- 1- A decrease in cortisol levels
- 2- An increase in LH levels
- 3- Hyperkalaemia
- 4- Impaired glucose tolerance
- 5- Raised androgen levels

Answer & Comments

Answer: 4- Impaired glucose tolerance

Malnutrition is another cause of diabetes. (Can you name the others? In addition to type 1 and type 2, gestational or post pancreatitis / pancreatectomy, read more about the others).

Cortisol and growth hormone levels are elevated.

Luteinising hormone (LH) and follicle-stimulating hormone (FSH) would be low and LH response to luteinising-hormone releasing hormone (LHRH) is impaired when weight loss is severe.

Hypokalaemia (not hyperkalaemia) may be seen.

Also there may be:

- Hypoalbuminaemia
- Anaemia
- Leukopenia
- Raised serum carotene.



[Q: 3814] OnExamination 2012 - Psychiatry

Which of the following features is

characteristic of early Alzheimer's disease?

- 1- Ataxic gait
- 2- Impaired short term memory
- 3- Myoclonic jerks
- 4- Urinary incontinence
- 5- Visual hallucinations

Answer & Comments

Answer: 2- Impaired short term memory

Alzheimer's disease is characterised early in the disease by short term memory loss.

The other features listed here would suggest an alternative diagnosis such as:

Normal pressure hydrocephalus (gait ataxia and urinary incontinence)

Creutzfeldt-Jakob disease (myoclonic jerks)

Delirium or vascular dementia (visual hallucinations).



[Q: 3815] OnExamination 2012 - Psychiatry

A 17-year-old girl presents after having ingested 50 of her mother's fluoxetine tablets, approximately five hours previously.

Which one of the following clinical features is compatible with this history?

- 1- Heart rate of 30 beats per minute
- 2- Pupillary constriction
- 3- QRS duration of 120 ms (<100)
- 4- Respiratory rate of six breaths per minute
- 5- Vomiting

Answer & Comments

Answer: 5- Vomiting

Unlike the tricyclic antidepressants, fluoxetine, like many of the SSRIs are safe in overdose, causing very few effects.

Rarely, reports would suggest that tachycardia can occur together with

Tremor

Drowsiness

Nausea

Vomiting.

Pupillary constriction or respiratory suppression suggests opiates.

Prolonged QRS complex is consistent with TCA overdose.



[Q: 3816] OnExamination 2012 - Psychiatry

A 17-year-old female is referred with a six month history of amenorrhoea and weight loss, for which no organic cause can be found.

Which of the following features would support a diagnosis of anorexia nervosa (AN)?

- 1- Delusion of being overweight
- 2- Delusions of poisoning
- 3- Hypergonadotrophic hypogonadism
- 4- Hypotrichosis
- 5- Watery diarrhoea

Answer & Comments

Answer: 1- Delusion of being overweight

Features of AN include:

- A phobic avoidance of normal weight
- Relentless dieting
- Self-induced vomiting
- Laxative use
- Excessive exercise
- Amenorrhoea
- Lanugo hair
- Hypotension
- Denial

- Concealment
- Overperception of body image
- Enmeshed families.



[Q: 3817] OnExamination 2012 - Psychiatry

Which of the following is true regarding depersonalisation syndrome?

- 1- Characteristically precedes derealisation
- 2- Is a feeling that other people have changed
- 3- Is an indication for electroconvulsive therapy (ECT)
- 4- Is associated with depression
- 5- Precedes the onset of schizophrenia

Answer & Comments

Answer: 4- Is associated with depression

Depersonalisation is not exclusively seen in schizophrenics.

The feeling that other people have changed is derealisation - see below.

Depersonalisation may occur in

- Almost all major psychiatric disorders
- Drug abuse
- Migraine
- Epilepsy
- Systemic lupus erythematosus (SLE)

and, transiently, in

Normal individuals.

ECT has been tried in the past.

Selective serotonin reuptake inhibitor (SSRI) antidepressants and coping strategies are useful.

Derealisation is a separate pathology.

Depersonalisation is a change in an individual's self-awareness such that they feel detached from their own experience with the self, the body and mind seeming alien.

Derealisation is a change in an individual's experience of the environment where the world around them feels unreal and unfamiliar.



[Q: 3818] OnExamination 2012 - Psychiatry

A 30-year-old male presented with a paranoid psychosis accompanied by visual hallucinations which resolved over the next three days.

Which one of the following is the most likely diagnosis?

- 1- Alcohol withdrawal.
- 2- Diazepam dependence.
- 3- Fluoxetine overdose.
- 4- Heroin withdrawal.
- 5- Smoking cannabis.

Answer & Comments

Answer: 1- Alcohol withdrawal.

The key points in the history are that, firstly, these are visual hallucinations and secondly that they resolve over 72 hours. Of all the options given, alcohol withdrawal is the most likely. The fact that this patient has paranoid psychosis makes it even more likely.

Symptoms typically present about 8 hours after a significant fall in blood alcohol levels. The peak is on day two, and by day five the symptoms are significantly better. Minor withdrawal symptoms appear 6-12 hours after cessation of alcohol and include: insomnia, fatigue, tremor, anxiety, nausea, vomiting, headache, sweating, palpitations, anorexia, depression and craving. Alcoholic hallucinosis can appear 12-24 hours after stopping alcohol and includes visual, auditory

and tactile hallucinations. Withdrawal seizures can appear 24-28 hours after cessation and are generalised tonic-clonic seizures. Alcohol withdrawal delirium ('delerium tremens') can appear 48-72 hours after cessation. Mortality without treatment is approximately 35%.

Benzodiazepines can cause a protracted withdrawal syndrome, with symptoms persisting for 6 months or more. It is characterised by anxiety, irritability, insomnia and sensory disturbance. In severe cases it can resemble mania and schizophrenia.

Fluoxetine overdose typically causes few symptoms, but can be associated with arrhythmias.

Heroin withdrawal has significant physical symptoms, including tremors, cramps, muscle and bone pain, rhinitis, tachycardia and diarrhoea and vomiting, in addition to psychiatric symptoms.

Cannabis use causes relaxation, euphoria, short-term memory loss and dry mouth and eyes. A withdrawal syndrome is recognised but not well defined. Long-term use has been linked with paranoia and schizophrenia, but these symptoms do not resolve quickly and visual hallucinations are unlikely.



[Q: 3819] OnExamination 2012 - Psychiatry

A student is worried that she may not be able to take her final university examinations in three months time because she says she becomes faint and dizzy when she does examinations.

What is the most appropriate course of action?

- 1- 24 hour ECG monitoring
- 2- Advise her to withdraw from examinations on medical grounds
- 3- Arrange counselling, with relaxation training

4- Prescribe diazepam

5- Prescribe fluoxetine

Answer & Comments

Answer: 3- Arrange counselling, with relaxation training

The symptoms the student describes are characteristic of stress/anxiety and are quite common.

She should be reassured.

Electrocardiogram (ECG) monitoring would support her fears of organic disease.

Diazepam would impair her examination performance and fluoxetine may increase feelings of anxiety.



[Q: 3820] OnExamination 2012 - Psychiatry

A 22-year-old woman complains of haemoptysis, abdominal pains and pyrexia for a month.

She is admitted to hospital and found to be afebrile and haemodynamically stable. There are numerous crusted, linear lesions on her forearms.

What is the most likely diagnosis?

- 1- Acute intermittent porphyria
- 2- Factitious disorder
- 3- Systemic lupus erythematosus
- 4- TB
- 5- Wegener's granulomatosis

Answer & Comments

Answer: 2- Factitious disorder

The history is very vague and the patient has no clinical features other than a rash which sounds typical of dermatitis artefacta.

The crusted lesions on the forearms suggest artefacta or wounds from recent self harm as this is the most typical site for these lesions.

Porphyria may be expected to have vesicles on sun exposed regions, face, arms and legs.



[Q: 3821] OnExamination 2012 - Psychiatry

Which of the following is true of obsessional neurosis (obsessive compulsive disorder)?

- 1- Low intelligence is a common feature
- 2- Patients have good insight
- 3- Patients often act on their aggressive impulses
- 4- The onset is usually after the age of 50 years
- 5- There is often a history of faulty toilet training

Answer & Comments

Answer: 2- Patients have good insight

Obsessional neurosis is associated with rituals, fears (for example, hurting others but never carried out), thoughts abhorrent to the patient and ruminations.

The illness is distressing to them and may cause depression.

It usually starts in early adult life with equal sex incidence.

The intelligence of these subjects is often above average.



[Q: 3822] OnExamination 2012 - Psychiatry

Which of the following symptoms is more suggestive of a functional disorder?

- 1- Disorientation in time
- 2- Inability to retain new information
- 3- Mutism

4- Perseveration

5- Visual hallucinations

Answer & Comments

Answer: 3- Mutism

Functional refers to an illness that is without a structural defect.

Organic brain syndromes are physical conditions including structural brain disease and metabolic disturbances causing mental dysfunction.

Mutism is the most likely of the symptoms described to be associated with a functional disorder but is associated with schizophrenia or autism.



[Q: 3823] OnExamination 2012 - Psychiatry

A 17-year-old student presented with recurrent attacks of dizziness.

Which one of the following additional features is most suggestive that she has an anxiety disorder?

- 1- Elevated diastolic blood pressure
- 2- Nocturia
- 3- Paraesthesia in the hands
- 4- Rotational vertigo
- 5- Tinnitus

Answer & Comments

Answer: 3- Paraesthesia in the hands

Paraesthesia is often experienced with hyperventilation associated with anxiety disorders and is often in hands, feet and periorally.

Rotational vertigo and tinnitus suggest an organic disorder, whilst anxiety disorder may be associated with raised systolic blood pressure, but not diastolic



[Q: 3824] OnExamination 2012 - Psychiatry

An 18-year-old female is reluctant to eat food that is prepared for her.

Which one of the following would be most consistent with a diagnosis of anorexia nervosa?

- 1- She believes the food is poisoned
- 2- She has a full-time job
- 3- She has bouts of heavy drinking
- 4- She regards herself as ill
- 5- She secretly abuses anabolic steroids

Answer & Comments

Answer: 2- She has a full-time job

Anorexia nervosa is associated with the abnormal perception of body image.

Patients generally feel well despite the protestations of others who think that they look awful. They exercise avidly and until the very late stages of the disease hold down full time jobs.

There is no delusion with regard to the food being poisoned.

Heavy drinking associated with food refusal would suggest alcoholism and alcoholic gastritis.

The secretive abuse of laxatives would fit with the diagnosis rather than anabolic agents.



[Q: 3825] OnExamination 2012 - Psychiatry

A 25-year-old male with learning difficulties presents with behavioural problems.

He confessed to smoking the occasional cannabis joint.

Which of the following is most likely to be the cause of his behavioural problems?

- 1- Cannabis

- 2- Dementia
- 3- Depression
- 4- Mania
- 5- Schizophrenia

Answer & Comments

Answer: 3- Depression

This man may be frustrated by his incapacity and would appear to be having behavioural problems as a manifestation of his depression.

Cannabis may actually relieve these frustrations.

There are no features to suggest an organic brain syndrome.



[Q: 3826] OnExamination 2012 - Psychiatry

An 18-year-old man had repeated episodes of breathlessness and palpitations, lasting about 20 minutes and resolving gradually.

There were no abnormal physical signs.

What is the most likely cause of these features?

- 1- Drug abuse
- 2- Panic disorder
- 3- Paroxysmal supraventricular tachycardia (SVT)
- 4- Personality disorder
- 5- Thyrotoxicosis

Answer & Comments

Answer: 2- Panic disorder

Drug abuse is unlikely since the symptoms are quite short lived.

We would expect other symptoms such as gastrointestinal (GI) disturbance, headaches or hypertension to accompany a variety of drug abuse causes.

Paroxysmal SVT would start and stop suddenly, not gradually.

Personality disorder and thyrotoxicosis would both be expected to lead to symptoms of longer duration with other associated symptoms.

This leaves 'panic disorder' as the most likely diagnosis.



[Q: 3827] OnExamination 2012 -
Ophthalmology

Which of the following conditions is associated with a pathognomonic retinal change?

- 1- Infective endocarditis
- 2- Polycythaemia rubra vera
- 3- Sickle cell anaemia
- 4- Toxoplasmosis
- 5- Wilson's disease

Answer & Comments

Answer: 3- Sickle cell anaemia

Sickle cell disease (SCD) is associated with the 'black sunburst' - a chorioretinal scar, which is one of the commoner retinal manifestations of SCD and pathognomonic.

Roth spots, seen in infective endocarditis, are also seen in leukaemia.

Choroidoretinitis in toxoplasmosis may also be seen with other disorders.

The Kayser-Fleischer (KF) rings of Wilson's disease are found on the iris.



[Q: 3828] OnExamination 2012 -
Ophthalmology

A 50-year-old man presented with a three day history of floaters and blurred vision in his left eye.

What is the diagnosis?

- 1- Angioid streaks
- 2- Arteriolar embolus
- 3- Diabetic retinopathy
- 4- Macular degeneration
- 5- Reactivation of Toxoplasma chorioretinitis

Answer & Comments

Answer: 5- Reactivation of Toxoplasma chorioretinitis

Toxoplasma chorioretinitis is the most common cause of infectious retinitis in immunocompetent individuals. It is caused by the obligate intracellular protozoan parasite *Toxoplasma gondii*, the definitive host of which is the cat. Human infection occurs following ingestion of cysts, which are shed in cat faeces, via contaminated drinking water or infected meat.

Reactivation may occur following infection and is commonly seen as an area of inflammation adjacent to an area of chorioretinal scarring.

The photograph shows a colour photograph of the left fundus with a white area of inflammation adjacent to a scar nasal to the optic disc.

There may be coexisting vitritis and aqueous cells and keratic precipitates. Diagnosis is confirmed by serology. Patients should be referred to a specialist ophthalmic unit for treatment.

Regarding the listed options:

A. Angioid streaks is incorrect. These are dark linear lesions with irregular edges, radiating out from the optic disc. They are caused by breaks in Bruch's membrane and are associated with systemic diseases including

- Pseudoxanthoma elasticum
- Ehlers-Danlos syndrome
- Paget's disease
- Thalassaemias.

B. Arteriolar embolus is incorrect. This would cause retinal pallor distal to the location of the embolus.

C. Diabetic retinopathy is incorrect as there are no signs of diabetic retinopathy (for

example, haemorrhage, exudates, cotton wool spots).

D. Macular degeneration is incorrect as the macula is healthy.

E. Reactivation of Toxoplasma chorioretinitis is correct.



[Q: 3829] OnExamination 2012 - Ophthalmology

A 45-year-old woman presents with a three day history of red right eye associated with an aching pain. She reports the pain is so severe it keeps her awake at night. Her vision is unaffected.

Photo of her right eye shows vasodilation of the deep and superficial episcleral vessels, which did not blanch on application of topical phenylephrine 2.5%. Her globe was tender and she experienced pain on eye movements.

Her past medical history includes Crohn's disease.

What is the diagnosis?

- 1- Acute anterior uveitis
- 2- Blepharoconjunctivitis
- 3- Conjunctivitis
- 4- Episcleritis
- 5- Scleritis

Answer & Comments

Answer: 5- Scleritis

Scleritis is a rare cause of red eye, associated with severe aching pain which classically disturbs sleep. The pain may be worse on eye movements and the eye is tender to touch.

It is associated with systemic diseases including:

Rheumatoid arthritis

Wegener's granulomatosis

Polyarteritis nodosa

Systemic lupus erythematosus

Sarcoidosis

Inflammatory bowel disease.

Episcleritis is a common cause of red eye which may be associated with mild discomfort. Application of topical phenylephrine 2.5% leads to blanching of episcleral vessels in episcleritis but not in scleritis.

A. Acute anterior uveitis is incorrect as it does not cause sectoral redness.

B. Blepharoconjunctivitis is incorrect as it does not cause severe pain or pain on eye movements.

C. Conjunctivitis is incorrect as above.

D. Episcleritis is incorrect as it does not lead to severe pain associated with disturbing sleep. Topical phenylephrine 2.5% leads to blanching of vessels in episcleritis.

E. Scleritis is correct.



[Q: 3830] OnExamination 2012 - Ophthalmology

A 53-year-old woman presents with a five day history of a painful left eye.

On examination there is a small white infiltrate on the inferior aspect of her left cornea, which is close to the limbal edge, but separated from it by an area of clear cornea.

The infiltrate stains with fluorescein and there is significant blepharitis affecting both lid margins. She reports no contact lens wear.

Her past medical history includes rheumatoid arthritis.

What is the diagnosis?

- 1- Anterior uveitis
- 2- Corneal abrasion
- 3- Herpes simplex keratitis
- 4- Hypopyon

5- Marginal keratitis

Answer & Comments

Answer: 5- Marginal keratitis

A. Anterior uveitis is incorrect as this does not cause an infiltrate.

B. Corneal abrasion is incorrect as there is an infiltrate present indicating keratitis.

C. Herpes simplex keratitis is incorrect.

D. Hypopyon is incorrect, this refers to a collection of inflammatory material in the anterior chamber resulting in an opaque fluid level visible inferiorly. It occurs in severe cases of anterior uveitis or endophthalmitis.

E. Marginal keratitis is correct.

Marginal keratitis is areas of peripheral corneal infiltrates/ulcers associated with blepharitis. It classically causes an infiltrate near the limbal edge with an area of clear cornea. There may be limbal vessels growing towards the lesion/s.

It is thought to be caused by a hypersensitivity reaction to staphylococcal exotoxins from *Staphylococcus aureus* present on the lid margins in blepharitis.

Treatment involves topical steroids for the keratitis and lid hygiene advice and topical antibiotics to treat the underlying blepharitis. In severe cases oral doxycycline can also be used.



[Q: 3831] OnExamination 2012 - Ophthalmology

A 50-year-old man presented with a three day history of red eye associated with pain, blurring of vision and photophobia.

Examination revealed cells in the anterior chamber. He was diagnosed with anterior uveitis. A photo of his eye is shown with a characteristic sign of anterior uveitis.

What is the diagnosis?

1- Corneal oedema

2- Hypopyon

3- Keratic precipitates

4- Posterior synechiae

5- Punctuate epithelial erosions

Answer & Comments

Answer: 3- Keratic precipitates

Of the listed options,

Option:

A. Corneal oedema is incorrect as the cornea is clear allowing visualisation of the iris details.

B. Hypopyon is incorrect. This is a collection of inflammatory exudate in the anterior chamber resulting in a white fluid level. It is associated with severe inflammation in the eye.

C. Keratic precipitates is correct. The photograph shows small opaque aggregates on the endothelium.

D. Posterior synechiae is incorrect, the pupil is dilated, spherical and symmetrical.

E. Punctuate epithelial erosions is incorrect. They are fine defects of the epithelium which show up with fluorescein. They are not a sign of anterior uveitis.



[Q: 3832] OnExamination 2012 - Ophthalmology

A 47-year-old man, who is currently being treated with quadruple therapy for pulmonary tuberculosis comes to the Emergency department complaining of a sudden deterioration in the visual acuity in his left eye and loss of colour vision.

Which of the following anti-tuberculous agents is most likely to have been responsible?

1- Ethambutol

- 2- Isoniazid
- 3- Pyrazinamide
- 4- Rifampicin
- 5- Streptomycin

Answer & Comments

Answer: 1- Ethambutol

The answer is ethambutol, which is associated with:

Retrobulbar neuritis

Generalised cutaneous reactions

Hepatitis

Peripheral neuropathy.

The retrobulbar neuritis seen with ethambutol may be unilateral or bilateral; as such unilateral symptoms do not preclude the diagnosis.

Isoniazid is associated with peripheral neuropathy, skin rash and hepatitis

Pyrazinamide can cause arthralgia and hepatitis.

Streptomycin is associated with vestibular and auditory nerve damage.

Rifampicin causes orange discolouration of secretions, and may cause hepatitis.



[Q: 3833] OnExamination 2012 - Ophthalmology

A 47-year-old man, otherwise fit and healthy, complained of a one week history of not being able to see objects placed at the centre of his visual fields, even with both eyes opened.

An objective visual fields test revealed an incongruous binasal hemianopia.

What is the most likely diagnosis?

- 1- Carotid-cavernous sinus fistula
- 2- Craniopharyngioma

- 3- External carotid artery dissection
- 4- Internal carotid artery displacement
- 5- Pituitary tumour

Answer & Comments

Answer: 4- Internal carotid artery displacement

Bilateral internal carotid artery displacement can cause binasal incongruous hemianopia if the optic nerves are compressed.



[Q: 3834] OnExamination 2012 - Ophthalmology

Which one of the following diseases is most likely to be associated with scleritis?

- 1- Ankylosing spondylitis
- 2- Crohn's disease
- 3- Rheumatoid arthritis
- 4- SLE
- 5- Ulcerative colitis

Answer & Comments

Answer: 3- Rheumatoid arthritis

Rheumatoid arthritis is associated with scleritis, whereas the other choices are more associated with anterior uveitis.



[Q: 3835] OnExamination 2012 - Ophthalmology

A 26-year-old tall, thin, lady with a known cardiac valvulopathy, was reported to have skin laxity and folds on the back of the neck and her underarms.

Fundoscopy revealed bilateral angioid streaks with optic disc drusens.

What is the most likely diagnosis?

- 1- Ehlers-Danlos syndrome
- 2- Marfan's syndrome
- 3- Menkes syndrome

- 4- Osteogenesis imperfecta
5- Pseudoxanthoma elasticum

Answer & Comments

Answer: 5- Pseudoxanthoma elasticum

Pseudoxanthoma elasticum with angioid streaks is also known as Grönblad-Strandberg syndrome.

Ehlers-Danlos and Marfan's syndrome are not associated with laxity and folds of skin on the back of the neck.

Menkes syndrome and osteogenesis imperfecta are not associated with angioid streaks.



[Q: 3836] OnExamination 2012 - Ophthalmology

A 28-year-old Lebanese lady developed left branch retinal artery occlusion (BRAO) one week after an uneventful elective caesarean section. She also developed some mouth and vulval ulcers two weeks post-partum.

Visual acuity in the affected left eye was counting fingers.

Full blood picture, U&Es and coagulation screen were all within normal limits. CRP was 28. Anti-nuclear antibody, ANA titre was 1:20.

What is the most likely cause of her left BRAO?

- 1- Amniotic fluid embolus
2- Behçet's disease
3- Fat embolus
4- Reiter's syndrome
5- SLE

Answer & Comments

Answer: 2- Behçet's disease

This lady with thrombosis and oro-genital ulceration has Behçet's syndrome.

Behçet's syndrome is a systemic vasculitis with an unknown aetiology, which affects small and large vessels (venous and arterial). More than 60% of patients are HLA-B51, and there is an increased prevalence in the Mediterranean countries. It is commonly associated with mucocutaneous manifestations (oro-genital ulceration, erythema nodosum), ocular disease, gastrointestinal involvement and neurological features. Venous thrombosis is a common complication, but arterial occlusion can also occur.

The International Study Group criteria for classification of Behçet's disease requires the presence of recurrent oral ulceration (minor aphthous, major aphthous or herpetiform ulceration observed by physician or patient, which have recurred at least three times in a 12 month period), and two of the following:

- Recurrent genital ulceration: aphthous ulceration or scarring, observed by physician or patient
- Eye lesions: anterior uveitis, posterior uveitis, or cells in vitreous on slit lamp examination; or retinal vasculitis observed by ophthalmologist
- Skin lesions: erythema nodosum observed by physician or patient, pseudofolliculitis or papulopustular lesions; or acneiform nodules observed by the physician in post-adolescent patients not on corticosteroid treatment
- Positive pathergy test: read by physician at 24-48 hours.

Pathergy is the non-specific hyper-reactivity of the skin following minor trauma, and is specific to Behçet's disease. It involves intradermal injection of skin with a 20-gauge needle under sterile conditions. It is considered positive if an erythematous sterile papule develops within 48 hours.

Recurrent oral ulcers occur in SLE but genital ulcers are less common. Additional features are usually present in this condition.

Reiter's syndrome (reactive arthritis) is not typically associated with thrombosis.

Amniotic fluid embolism presents with rapid cardiovascular collapse, acute left ventricular failure with pulmonary oedema, disseminated intravascular coagulation and neurological impairment.

Fat embolism usually presents following long bone fracture, and causes an acute respiratory distress syndrome associated with fever, petechial rash and neurological impairment.



[Q: 3837] OnExamination 2012 - Ophthalmology

A 64-year-old man presents with redness affecting his right eye, having noticed it on waking two days earlier.

He reports no pain, watering or discharge and his vision is unaffected. There was no corneal staining with fluorescein.

What is the diagnosis?

- 1- Conjunctivitis
- 2- Episcleritis
- 3- Herpes simplex keratitis
- 4- Iritis
- 5- Subconjunctival haemorrhage

Answer & Comments

Answer: 5- Subconjunctival haemorrhage

A. Conjunctivitis is incorrect as it causes diffuse redness associated with discharge.

B. Episcleritis is incorrect as although it can cause sectoral redness the conjunctival vessels are still visible.

C. Herpes simplex keratitis is incorrect. This is a cause of painful red eye and classically a

dendritic ulcer visible with fluorescein staining.

D. Iritis is incorrect as it is a cause of painful red eye, associated with watering, photophobia and blurring of vision.



[Q: 3838] OnExamination 2012 - Ophthalmology

Which of the following may be associated with optic atrophy (OA)?

- 1- Anti-acetylcholinesterase antibodies
- 2- Intense iron deposition on liver biopsy
- 3- Low plasma caeruloplasmin
- 4- Red ragged fibres on muscle biopsy
- 5- XXY karyotype

Answer & Comments

Answer: 4- Red ragged fibres on muscle biopsy

Red ragged fibres found in mitochondrial myopathy are found in Kearns-Sayre syndrome; mitochondrial myopathy, lactic acidosis and stroke-like episodes (MELAS); and Leber's optic atrophy.

Wilson's disease is associated with Kayser-Fleischer (KF) rings; and myotonic dystrophy rather than myasthenia gravis is associated with OA.

OA is not associated with Klinefelter's disease.



[Q: 3839] OnExamination 2012 - Ophthalmology

A 31-year-old man presented with raised yellow lesions above the left upper eye lid.

What is the diagnosis?

- 1- Acne rosacea
- 2- Eczema
- 3- Herpes simplex

4- Herpes zoster ophthalmicus

5- Molluscum contagiosum

Answer & Comments

Answer: 3- Herpes simplex

Herpes simplex virus may lie dormant in the trigeminal ganglion, reactivation can occur giving rise to eyelid and periorbital vesicles. The patient may experience prodromal facial and lid tingling, and may have associated conjunctivitis, lid swelling and/or keratitis.

It can be treated with topical or oral aciclovir (for example, 400 mg five times a day for three days¹) although oral aciclovir is usually better tolerated.

In patients with atopic dermatitis or eczema herpes simplex infection can cause eczema herpeticum, which may be further complicated by secondary staphylococcal infection. This is treated by adding oral antibiotics, for example, flucloxacillin 500 mg q.i.d.

Eczema herpeticum is a serious and potentially life-threatening condition which may require medical and dermatology input.

[BNF treatment for non-genital herpes simplex treatment is aciclovir 200 mg (400 mg in the immunocompromised or if absorption impaired) five times daily usually for five days (longer if new lesions appear during treatment or if healing incomplete).]

A. Acne rosacea is incorrect. This causes facial erythema commonly affecting the cheeks, nose and forehead.

B. Eczema is incorrect. This is a form of dermatitis characterised by dryness and erythema. Herpes simplex in atopic individuals can give rise to eczema herpeticum which is treated with both systemic antivirals and antibiotics.

C. Herpes simplex is correct.

D. Herpes zoster ophthalmicus is caused by the varicella zoster virus, which starts as a maculopapular rash progressing to vesicles, pustules and crusting in the distribution of the dermatome served by the ophthalmic division of the trigeminal nerve. It mainly affects elderly patients but may affect younger patients and is more severe in patients who are immunocompromised.

E. Molluscum contagiosum is incorrect, this is also caused by a viral infection (human specific double-stranded DNA poxvirus) but gives rise to pearly umbilicated lesions. It commonly affects children, most commonly between the ages of 2 and 4.

It is highly contagious and is transmitted by contact. Treatment may not be necessary unless the lesions are close to the lid margin, in which case treatment options include shave excision or cauterisation.

Reference:

Kanski JJ. Clinical Ophthalmology: A systematic approach. 6th edition, Butterworth-Heinemann, 2007.



[Q: 3840] OnExamination 2012 - Ophthalmology

A 24-year-old wearer of daily disposable contact lenses presented with a two day history of red eye with associated soreness.

Examination revealed a small corneal ulcer on her right eye.

What would be first line treatment?

- 1- Brolene drops two hourly
- 2- Chloramphenicol drops four times a day
- 3- Fucithalamic ointment twice a day
- 4- Levofloxacin hourly
- 5- Predsol drops four times a day

Answer & Comments

Answer: 4- Levofloxacin hourly

A. Brolene is incorrect as it does not treat *Pseudomonas aeruginosa* which is commonly associated with contact lens related infections.

It is used in the management of Acanthamoeba keratitis, which is a rare and serious keratitis associated with contact lens (CL) wear. Risk factors for Acanthamoeba keratitis are exposure of CL to contaminated water, for example, using tap water to clean CL or swimming in lenses.

Clinical features of Acanthamoeba keratitis include pain out of proportion to clinical signs, ring infiltrates and radial keratoneuritis.

B. Chloramphenicol is incorrect as above as it does not cover *Pseudomonas*.

C. Fucithalmic is incorrect as above.

D. Levofloxacin hourly is correct. The management must also include advising the patient to discontinue wearing contact lenses and referral to a specialist ophthalmic unit.

E. Predsol is incorrect and contraindicated as sole therapy in the management of contact lens related keratitis.



[Q: 3841] OnExamination 2012 - Ophthalmology

A 28-year-old man presents with a three day history of 'gritty pain' in his right eye with pain on blinking. He recollects no history of trauma.

He is otherwise well but occasionally experiences cold sores.

On examination there are multiple linear epithelial defects.

Which of the options below must be included in the management?

- 1- Aciclovir ointment
- 2- Everting the eyelid
- 3- Oral antibiotics

4- Orbital x ray

5- Topical steroid drops

Answer & Comments

Answer: 2- Everting the eyelid

Options A, C, D and E are incorrect as they would fail to solve the cause of the problem.

Option B, everting the eyelid, is the correct answer as symptoms and signs are suggestive of a subtarsal foreign body so the appropriate management would be to examine underneath the lid to search for and remove a foreign body.

Further management would involve topical chloramphenicol ointment three to four times a day for five days.



[Q: 3842] OnExamination 2012 - Ophthalmology

A 33-year-old man presents with a four day history of painful loss of vision. His past medical history includes eczema and hay fever.

On examination his cornea is opaque and appears to be protruding. The corneal surface appears irregular but there is no staining with fluorescein.

What is the diagnosis?

- 1- Acute anterior uveitis
- 2- Acute corneal hydrops
- 3- Episcleritis
- 4- Herpes simplex keratitis
- 5- Scleritis

Answer & Comments

Answer: 2- Acute corneal hydrops

Acute corneal hydrops occurs in advanced keratoconus, which is the most common cause of corneal ectasia.

The cornea is made of 3 main layers:

Epithelium

Stroma

Endothelium

The transparency of the cornea is maintained by the endothelium which constantly pumps water out from the stroma.

Descemet's membrane is a specialised basement membrane which lies between the endothelium and stroma, which helps to provide structural integrity to the cornea. In acute corneal hydrops the endothelium and Descemet's membrane split which allows aqueous to enter the corneal stroma.

Stromal and epithelial oedema results in corneal opacification and formation of epithelial bullae.

Keratoconus is associated with atopic conditions (for example, asthma, hay fever, eczema) and Down's syndrome.

Options A, C, D and E are incorrect as they do not cause this level of corneal oedema or protrusion of the cornea.

Acute corneal hydrops (option B) is correct as it results in acute blurring of vision associated with corneal opacification and corneal protrusion.



[Q: 3843] OnExamination 2012 - Ophthalmology

An 18-year-old man was found to have multiple small pigmented lesions in the peripheral retina of both eyes.

These lesions resembled bear tracks. However, his visual acuity was 6/6 on the Snellen chart in both eyes. His father also had similar lesions.

Which one of the following would be the best next step in managing this man's condition?

1- Referral to cardiology

2- Referral to endocrinology

3- Referral to gastroenterology

4- Referral to infectious disease specialist

5- Referral to ophthalmology

Answer & Comments

Answer: 3- Referral to gastroenterology

This description of the lesion is that of congenital hypertrophy of retinal pigment epithelium (CHRPE), which is associated with autosomal dominantly inherited familial adenomatous polyposis (FAP).

A referral to gastroenterology is the best next step.



[Q: 3844] OnExamination 2012 - Ophthalmology

A 45-year-old lady with rheumatoid arthritis attended a routine appointment at the rheumatology clinic, and was complaining of a two day history of right red eye with dull pain.

She denied any photophobia and there was no ocular discharge noted.

What is the most likely diagnosis?

1- Acute angle closure glaucoma

2- Conjunctivitis

3- Inflammation caused by corneal melt

4- Scleritis

5- Scleromalacia perforans

Answer & Comments

Answer: 4- Scleritis

Rheumatoid arthritis is associated with both scleritis and episcleritis.

Scleritis may cause severe pain and results in diffuse or nodular injection.

Episcleritis results in ocular irritation with nodules.

In the absence of photophobia and discharge, scleritis would be the best answer.



[Q: 3845] OnExamination 2012 - Ophthalmology

A 34-year-old man, who has just recovered from gastroenteritis following a recent trip to Turkey, suddenly developed progressive gait ataxia and restriction of eye movements in all directions of gaze.

There was no nystagmus.

What is the most likely diagnosis?

- 1- Acute cerebellar degeneration
- 2- Millard-Gubler syndrome
- 3- Miller-Fisher syndrome
- 4- Parinaud's syndrome
- 5- Subacute combined degeneration of the spinal cord

Answer & Comments

Answer: 3- Miller-Fisher syndrome

Miller-Fisher syndrome is a variant/spectrum of Guillain-Barré syndrome (GBS).

GBS is associated with Campylobacter jejuni infection, which can trigger this syndrome.

Miller-Fisher is classically described as a triad of:

- * External ophthalmoplegia
- * Ataxia
- * Areflexia

so the above history would be most in keeping with Miller-Fisher syndrome.



[Q: 3846] OnExamination 2012 - Ophthalmology

A 61-year-old emmetropic female nurse presented with a three day history of missing steps when walking down the stairs as she was seeing double of each of the steps. She

reported no such problems when walking up the stairs.

She admitted to bumping her head moderately hard when trying to get out of her car four days ago. She denied any deterioration of her visual acuity.

No horizontal diplopia was elicited.

What is the most likely cause of her problems?

- 1- Right inferior oblique palsy
- 2- Right inferior rectus palsy
- 3- Right superior oblique palsy
- 4- Right superior rectus palsy
- 5- This patient needs glasses for distance

Answer & Comments

Answer: 3- Right superior oblique palsy

This patient essentially suffered from vertical diplopia following bumping her head moderately hard.

The fourth cranial nerve can be affected in such a situation resulting in superior oblique palsy.



[Q: 3847] OnExamination 2012 - Ophthalmology

A 60-year-old man presents with an acute red eye.

Of the following conditions which is the most likely cause?

- 1- Closed angle glaucoma
- 2- Optic neuritis
- 3- Retinal vein occlusion
- 4- Retinal detachment
- 5- Vitreous haemorrhage

Answer & Comments

Answer: 1- Closed angle glaucoma

Of those listed the most likely to present with an acute red eye would be glaucoma.

Other causes of acute red eye include

Anterior uveitis

Corneal ulcers

Conjunctivitis

Scleritis

Episcleritis

Subconjunctival haemorrhage.

Optic neuritis presents with a particular type of central visual loss - a central scotoma.

Retinal vein occlusion, retinal detachment and vitreous haemorrhage would present as visual loss or disturbance.



[Q: 3848] OnExamination 2012 - Ophthalmology

A 34-year-old man presented with a two day history of red eye, associated with sharp pain, watering, photophobia and blurring of vision. He does not wear contact lenses.

He reports having two similar episodes over the past two years.

Examination revealed reduced corneal sensation and an irregular epithelial defect.

What is the diagnosis?

- 1- Episcleritis
- 2- Herpes simplex keratitis
- 3- Marginal keratitis
- 4- Microbial keratitis
- 5- Recurrent corneal erosion syndrome

Answer & Comments

Answer: 2- Herpes simplex keratitis

A. Episcleritis is incorrect as it does not cause a dendritic ulcer or reduced corneal sensation.

B. Herpes simplex keratitis is correct.

C. Marginal keratitis is incorrect as this causes ulceration close to the limbus, is neither dendritic in appearance nor causes reduced corneal sensation.

D. Microbial keratitis is incorrect as this does not cause a dendritic ulcer but usually a more spherical ulcer with associated infiltrate.

E. Recurrent corneal erosion syndrome is incorrect as this does not cause a dendritic ulcer or reduced corneal sensation. It is associated with previous corneal abrasions and classically presents with sudden onset severe pain typically occurring in the early hours of the morning.



[Q: 3849] OnExamination 2012 - Ophthalmology

A patient presents with deteriorating vision.

On examination, fundoscopy reveals retinitis pigmentosa.

Which of the following conditions would be unlikely to be responsible for this presentation?

- 1- Abetalipoproteinaemia
- 2- Friedreich's ataxia
- 3- Kearns-Sayre syndrome
- 4- Laurence-Moon-Biedl syndrome
- 5- Refsum's disease

Answer & Comments

Answer: 2- Friedreich's ataxia

Causes of pigmentary retinopathy include Usher's syndrome and mitochondrial myopathy.

Abetalipoproteinaemia is autosomal recessive and is associated with:

Hypocholesterolaemia syndrome resembling Friedreich's ataxia

Abnormally shaped red blood cells (RBC)
(acanthocytes)

Steatorrhoea and

Fatty liver.

Friedreich's is associated with optic atrophy.



[Q: 3850] OnExamination 2012 -
Ophthalmology

This is the appearance of the eye of a 32-year-old man who presents with blurring of vision.

Which of the following conditions would give rise to this appearance?

- 1- Cushing's syndrome
- 2- Diabetes mellitus
- 3- Hypertension
- 4- Marfan's syndrome
- 5- Reactive arthritis

Answer & Comments

Answer: 4- Marfan's syndrome

The image shows ectopia lentis with inferior dislocation of the crystalline lens.

Ectopia lentis is typically seen in connective tissue disorders such as

Marfan's syndrome

Ehlers-Danlos

Homocystinuria

Weill-Marchesani and

Osteogenesis imperfecta.

It can also be seen following trauma or surgery.

In Marfan's syndrome, lens dislocation often occurs supero-temporally, but not invariably.



[Q: 3851] OnExamination 2012 -
Ophthalmology

A 37-year-old homosexual male presented to the medical take with an acute onset of reduced vision in his left eye.

Fundoscopy of the left eye revealed an extensive 'brushfire-like' lesion in the major superior temporal arcade with a large patch of white fluffy lesion mixed with extensive retinal haemorrhages.

What is the most likely diagnosis?

- 1- CMV retinitis
- 2- Ocular histoplasmosis
- 3- Syphilitic choroiditis
- 4- Syphilitic neuroretinitis
- 5- Tuberculous periphlebitis

Answer & Comments

Answer: 1- CMV retinitis

This is a classic example of Cytomegalovirus (CMV) retinitis secondary to human immunodeficiency virus (HIV), as is suggestive of the information given in this scenario.

Ocular histoplasmosis and syphilitic choroiditis would give a fundus picture of multiple whitish lesions.

Syphilitic neuroretinitis would normally give a picture of a macular star exudation.

Tuberculous periphlebitis is the next closest answer, but does not fit the description of 'brushfire-like' lesion in that it gives a picture of perivenous sheathing and minimal retinal haemorrhages.



[Q: 3852] OnExamination 2012 -
Ophthalmology

A 65-year-old hypermetropic lady was seen in an acute unselected medical take.

She presented with a three hour history of dull pain, lacrimation, photophobia and reduced vision in the right eye.

She had no significant past medical history.

Ocular examination revealed a painful red eye with an oval shaped pupil.

What is the most likely diagnosis?

- 1- Acute angle closure glaucoma
- 2- Episcleritis
- 3- Iritis
- 4- Keratoconjunctivitis
- 5- Scleritis

Answer & Comments

Answer: 1- Acute angle closure glaucoma

Red eye of an acute painful dull nature, with photophobia and reduced vision in a hypermetropic person is highly indicative of acute angle closure glaucoma.

The pupil in this condition is usually mid-dilated oval shaped.

The oval shape is due to the iris sphincter ischaemia from the high intraocular pressure.



[Q: 3853] OnExamination 2012 - Ophthalmology

A 75-year-old man developed a gradual problem of not being able to look down over the last eight months. Then about two months ago, he was also not able to look up. He denied any diplopia, ocular pain or headaches.

There was no evidence of convergence retraction nystagmus, proptosis or ptosis.

What is the most likely diagnosis?

- 1- Chronic progressive external ophthalmoplegia
- 2- Ocular myasthenia
- 3- Ocular myositis

4- Parinaud's syndrome

5- Thyroid eye disease

Answer & Comments

Answer: 1- Chronic progressive external ophthalmoplegia

The history itself suggests a chronic progressive limitation of eye movements without any diplopia, proptosis or ptosis. Therefore, the most likely diagnosis is chronic progressive external ophthalmoplegia.

Ocular myasthenia usually presents with diplopia and ptosis.

Parinaud's syndrome usually manifests as up gaze palsy with convergence retraction nystagmus.



[Q: 3854] OnExamination 2012 - Ophthalmology

A 24-year-old lady with a BMI of 36 and on the combined oral contraceptive pill presented with a one month history of increasing vertex headaches, worse in the mornings and worse on coughing and sneezing. She also complained of blurry vision in both eyes.

Fundoscopy revealed bilateral extensive papilloedema with a lot of flame shaped haemorrhages around and on the optic discs.

Which one of the following is the best long term management of this patient?

- 1- Changing the combined oral contraceptive pill to an oestrogen based one
- 2- Commence on aspirin
- 3- Perform lumbar puncture
- 4- Reduce weight
- 5- Start oral acetazolamide

Answer & Comments

Answer: 4- Reduce weight

This patient has idiopathic intracranial hypertension. The best long term management is weight reduction, which can improve her symptoms.

Changing the combined oral contraceptive pill to a more oestrogen based one can worsen the symptoms.

Lumbar puncture and acetazolamide can help improve the symptoms, but should not be considered as long term management.



[Q: 3855] OnExamination 2012 - Ophthalmology

A 17-year-old male with learning difficulties is brought for review by his worried parents after he described acute blurring of vision in his right eye.

Examination reveals ectopia lentis.

What is the most likely diagnosis?

- 1- Ehlers-Danlos syndrome
- 2- Homocystinuria
- 3- Maple syrup urine disease
- 4- Marfan's syndrome
- 5- Metachromatic leukodystrophy

Answer & Comments

Answer: 2- Homocystinuria

Ectopia lentis/ subluxation of the lens is associated with:

Ehlers-Danlos syndrome

Marfan's syndrome

Weill-Marchesani syndrome (short stature, skeletal abnormalities and ectopia lentis)

Refsum's disease.

In this case homocystinuria is likely to be due to the associated mental retardation.

Patients typically have fair skin with coarse hair, osteoporosis, mental retardation (nearly

50%), seizure disorder, marfanoid habitus, and and increased thromboembolic risk.

Metachromatic leukodystrophy is a lysosomal storage disorder characterised by lipid (sulfatide) accumulation in the central nervous system and associated with psychomotor retardation in infants with optic atrophy and blindness.



[Q: 3856] OnExamination 2012 - Ophthalmology

A 53-year-old man presented with a one week history of bilateral red eyes, which started in his right eye and after three days spread to his other eye.

He reports associated soreness, watering but no discharge or change in his vision. He states his symptoms were preceded by an upper respiratory tract infection. He has a history of ulcerative colitis and reports his father had glaucoma.

On examination his vision is normal and there are bilateral conjunctival follicles.

What is the diagnosis?

- 1- Acute angle closure glaucoma
- 2- Acute anterior uveitis
- 3- Bacterial conjunctivitis
- 4- Episcleritis
- 5- Viral conjunctivitis

Answer & Comments

Answer: 5- Viral conjunctivitis

Viral conjunctivitis causes redness, soreness and watering. In severe cases it can cause a keratitis which may affect vision.

It is highly contagious so patients should be advised to practise strict hand hygiene, to avoid sharing towels and to take time off work.

It is a self-limiting disease which may take several weeks to resolve. Patients are treated

with topical lubricants and some ophthalmologists give topical chloramphenicol to protect against secondary bacterial infections.

Other causes of follicular conjunctivitis include:

Chlamydial conjunctivitis - (but this is associated with mucopurulent discharge)

Molluscum contagiosum

Herpes simplex

Drop hypersensitivity

Parinaud's oculoglandular syndrome.

Atopy and contact lens wear are causes of papillae.

A. Acute angle closure glaucoma (AACG) is incorrect as this causes severe pain and blurring of vision. Other symptoms of AACG include headache, nausea, vomiting and haloes.

B. Acute anterior uveitis is incorrect as this causes pain, photophobia and blurring of vision. It is not a cause of follicular conjunctivitis.

C. Bacterial conjunctivitis is incorrect as this causes discharge.

D. Episcleritis is incorrect as it is not a cause of follicular conjunctivitis.

E. Viral conjunctivitis is correct.



[Q: 3857] OnExamination 2012 - Ophthalmology

A 24-year-old lady presented with anisocoria, with the right pupil larger than the left, both in a brightly lit room and in a dim lit room. Her mother noticed this only five days ago.

The anisocoria was less marked in the dim lit room. Deep tendon reflexes were present and brisk throughout.

She occasionally noted horizontal diplopia with a right sided headache. There was no ptosis. Visual acuity was 6/6 on the Snellen chart in both eyes.

Which one of the following statements is most accurate?

- 1- The diagnosis is Holmes-Adie's syndrome
- 2- The diagnosis of a brain tumour needs to be excluded urgently
- 3- The diagnosis of a posterior communicating artery aneurysm needs to be excluded urgently
- 4- The pathological (diseased) pupil is actually the left pupil, diagnosis being Argyll Robertson pupil
- 5- When doing a swinging light test of the pupils, a right relative afferent papillary defect is to be expected

Answer & Comments

Answer: 3- The diagnosis of a posterior communicating artery aneurysm needs to be excluded urgently

The history of anisocoria, with headaches and diplopia should ring alarm bells, in that a life-threatening posterior communicating artery aneurysm/berry aneurysm needs to be excluded urgently.

Anisocoria being an efferent problem will not give a relative afferent papillary defect.

Holmes-Adie syndrome is characterised by a tonic pupil, which is larger than normal and constricts slowly in bright light, and absent deep tendon reflexes (most marked in the Achilles tendon). It develops gradually, and is a benign condition. It is thought to be the result of a neurotrophic viral infection.

The sudden onset of the symptoms make a brain tumour less likely than an aneurysm.

Argyll Robertson pupils are typically bilateral and are small and irregular with an absent light reflex, prompt accommodation reflex

and slow response to mydriatics. The most common case is syphilis.



[Q: 3858] OnExamination 2012 - Ophthalmology

A 25-year-old man presented with night blindness and gradual deterioration of his peripheral visual fields bilaterally.

Ocular examination revealed bony spiculed lesions in the peripheral retina of both eyes with attenuated retinal blood vessels.

His only other past medical history is that of a first degree heart block.

Which one of the following statements is most correct?

- 1- There is a one in two chance of him passing this disease on to his offspring
- 2- There is a one in four chance of him passing this disease on to his offspring
- 3- There is a one in 10 chance of him passing this disease on to his offspring
- 4- There is a 100% chance of him passing this disease on to his offspring
- 5- There is no chance of him passing this disease on to his offspring

Answer & Comments

Answer: 5- There is no chance of him passing this disease on to his offspring

The diagnosis is Kearns-Sayre syndrome.

This is a mitochondrial inherited disease, and as such is only passed on by mothers to offspring.

It is a slowly progressive neuromuscular disorder associated with progressive external ophthalmoplegia and heart conduction defect.

Ocular manifestations include ptosis and peripheral retinal bony spiculed appearances.



[Q: 3859] OnExamination 2012 - Ophthalmology

A 75-year-old man, known to have ischaemic heart disease, with a previous history of alcohol abuse, presented with a one week history of deterioration of central vision in the right eye.

He denied any ocular pain or headache. An objective visual fields test was done and he was found to have a right central scotoma.

What is the most likely diagnosis?

- 1- Alcohol toxic amblyopia
- 2- Macular degeneration
- 3- Ocular ischaemic syndrome
- 4- Vitamin A deficiency
- 5- Vitamin B₁₂ deficiency

Answer & Comments

Answer: 2- Macular degeneration

This history is most in keeping with macular degeneration.

The relatively short history is more suggestive of wet age-related macular degeneration, which is actually a systemic problem, of which ischaemic heart disease is a risk factor.

Toxic amblyopia will more often give a centro-caecal scotoma.

Central scotoma here indicates that only the macula region is involved.



[Q: 3860] OnExamination 2012 - Ophthalmology

A 23-year-old man with an otherwise insignificant past medical history, presented with a sharp painful left eye over the last one day.

Ocular examination revealed a left mildly red eye with mild reduction of visual acuity.

There were no ocular discharges to note.

What is the most likely diagnosis?

- 1- Episcleritis
- 2- Herpetic keratitis
- 3- Iritis
- 4- Posterior uveitis
- 5- Scleritis

Answer & Comments

Answer: 2- Herpetic keratitis

Any of the above given diagnoses can occur in a young man, but the history is that of a sharp painful eye, as opposed to a dull achy eye.

Any sharp ocular pain is more suggestive of corneal/ocular surface pathologies, and hence herpetic keratitis is the best answer.



[Q: 3861] OnExamination 2012 - Ophthalmology

A 45-year-old asthmatic man presented with bilateral blurry vision of gradual onset over the last two months.

On examination he was found to have bilateral posterior subcapsular cataract, more so in the right than the left.

His other past medical history was that he had galactosaemia when he was still a baby, but this has since been treated. He is on bronchodilator inhalers and steroid inhalers to control his asthma. His oral medication includes amiodarone, aspirin and simvastatin.

What is the most likely cause of his cataracts?

- 1- Amiodarone
- 2- Galactosaemia
- 3- Inhaled bronchodilators
- 4- Inhaled steroids
- 5- Simvastatin

Answer & Comments

Answer: 4- Inhaled steroids

Inhaled steroids can cause cataracts.

Amiodarone causes vortex keratopathy.

Galactosaemia also does cause cataracts, but if the galactosaemia is treated, the cataract is reversible.

Inhaled bronchodilators and simvastatin are not known to cause cataracts.



[Q: 3862] OnExamination 2012 - Ophthalmology

A 42-year-old lady presented with a two week history of noticing both her eyes were skewed towards the temporal side. She denied ocular pain and headaches. Her visual acuity was 6/6 on the Snellen chart in both eyes.

She was not able to adduct both eyes, but up and down gaze was fine. She had two previous episodes of optic neuritis in the right eye. The last episode happened four months ago.

Her walking was normal, and her deep tendon reflexes were present. She also had recovered from gastroenteritis three weeks ago.

What is the most likely condition with which the patient had presented?

- 1- Chronic progressive external ophthalmoplegia
- 2- Internuclear ophthalmoplegia
- 3- Miller Fisher syndrome
- 4- Ocular myasthenia
- 5- Parinaud's syndrome

Answer & Comments

Answer: 2- Internuclear ophthalmoplegia

This is a case of wall-eyed bilateral internuclear ophthalmoplegia (WEBINO).

The history suggests a demyelinating process, and failure of ocular adduction in such cases should prompt the diagnosis of internuclear ophthalmoplegia.



[Q: 3863] OnExamination 2012 -
Infectious disease

Regarding pneumonia caused by Legionella pneumophila, which of the following is true?

- 1- Is associated with hyponatraemia
- 2- Is best treated with intravenous amoxicillin and clavulanic acid
- 3- Is common in AIDS patients
- 4- Is readily diagnosed by standard aerobic culture of sputum
- 5- Should be managed on the ward in a respiratory isolation cubicle

Answer & Comments

Answer: 1- Is associated with hyponatraemia

Legionella pneumophila is a Gram negative bacillus that is ubiquitous in the environment.

Human infection occurs when a sufficient inoculum of bacteria are aerosolised and inhaled. It usually affects middle-aged and elderly patients, often with underlying lung disease. It is more common in men (3:1).

A variety of environmental sources have been identified as reservoirs of Legionella and have been responsible for infection in humans, including air conditioners, humidifiers, shower units and hot tubs. Other factors that predispose to infection include smoking, alcoholism, old age, chronic illness and immunosuppression. It is not common in AIDS, but in severe disease there is an increased risk.

Infection causes a flu-like illness with a dry cough, headache, confusion and delirium. Gastrointestinal upset is common, with diarrhoea and ileus. Focal neurological signs can develop. Bloods often show a normal white cell count with lymphopenia (with or without thrombocytopenia, or pancytopenia). Sodium is often low, due to a syndrome of inappropriate antidiuretic hormone. 50% of patients have abnormal renal and liver

function, and acute kidney injury can develop. Creatinine kinase can be raised.

Legionellae do not grow on standard culture media, but require specific supplemented media; they grow best at a low pH. Diagnosis is most commonly with antigen testing in the urine, but direct fluorescent antibody staining or serology can be used.

Erythromycin or clarithromycin are the antibiotics of choice; alternatives include doxycycline, co-trimoxazole or ciprofloxacin.



[Q: 3864] OnExamination 2012 -
Infectious disease

Which of the following concerning Corynebacterium diphtheriae is correct?

- 1- Can cause skin infection
- 2- Infection is often complicated by myocardial fibrosis after recovery from severe infection
- 3- Is most unlikely to cause infection in an individual with a positive Schick test
- 4- Mitis strain is generally more virulent than the intermedius strain
- 5- Toxin is better absorbed through the anterior nasal than the pharyngeal mucosa

Answer & Comments

Answer: 1- Can cause skin infection

Corynebacterium diphtheriae is a Gram positive, non-spore-forming, pleomorphic bacteria that is also a facultative anaerobe. It causes diphtheria in humans. There are three recognised strains of C.diphtheria: gravis, intermedius and mitis. Intermedius is thought to be the one most associated with the exotoxin and is more virulent than the mitis strain. Diphtheria is transmitted from person to person, with human beings the main reservoir. The Schick test involves the intradermal injection of a small amount of diphtheria toxin into the arm of a person. If

positive a wheal develops, which indicates the patient is susceptible to diphtheria. It is no longer used in routine clinical practice in the UK.

Typically diphtheria attacks the respiratory system, but may also affect the skin, conjunctiva and external genitalia. Signs and symptoms include sore throat, fever, and swelling of lymph nodes in the neck and general malaise. As the disease progresses diphtheria toxin is secreted. This destroys the membrane surface of the affected areas and replaces them with a greyish tough leathery "pseudomembrane" made of dead tissue, leukocytes and bacteria. The classical signs which may be described in examination questions include the dense grey pseudomembrane, which can occur in any portion of the respiratory tract (characteristically the posterior pharynx) and a 'bulls neck' which results from cervical lymphadenopathy and mucosal swelling.

Cutaneous diphtheria presents with non-healing ulcers covered with a grey membrane, which can develop bacterial co-infection. If isolated the disease is indolent, but the ulcers can act as a reservoir which can subsequently lead to pharyngeal infection.

Anterior nasal diphtheria usually presents in a similar fashion to the common cold, as absorption of the toxin here is minimal. Pharyngeal, tonsillar and laryngeal diphtheria results in higher absorption of toxin into the bloodstream and therefore more severe manifestations.

If absorbed systemically, toxin can also affect the heart, nerves and other organs in the body causing heart failure, nerve damage or suffocation. Cardiac involvement is usually in the form of a cardiomyopathy and myositis, which is evident from the 10-14th day and may lead to arrhythmias. This accounts for 50% of deaths, but myocardial fibrosis affects a minority infected with diphtheria.

Management of suspected cases should include isolation, securing a definitive airway, cardiac monitoring, and erythromycin or penicillin promptly. Antitoxin is available in the USA.

Diphtheria is a notifiable disease in the UK.



[Q: 3865] OnExamination 2012 - Infectious disease

A 35-year-old female who returned from holiday in Costa Rica two months ago now reports having ulceration around her neck with cervical lymphadenopathy.

The lesion was initially a papule then it turned into a nodule and is now an ulcer. The ulcer is pruritic with raised undulated borders. The thin smears of dermal scraping show amastigotes when stained with Giemsa.

What is the most likely aetiological agent?

- 1- Cutaneous leishmaniasis
- 2- Lepromatous leprosy
- 3- Mycobacterium tuberculosis ulceration
- 4- Visceral leishmaniasis
- 5- Visceral ulceration

Answer & Comments

Answer: 1- Cutaneous leishmaniasis

Mycobacterium tuberculosis ulceration usually has undermined edges. They will not have any amastigotes in stain.

Visceral ulceration is the wrong answer.

Visceral leishmaniasis is the wrong answer as it presents differently. The patient's skin may turn grey with hepatosplenomegaly and some may have a lymphadenopathy.

Lepromatous leprosy usually forms poorly margined, multiple infiltrated nodules and plaques of diffuse infiltration.



[Q: 3866] OnExamination 2012 -

Infectious disease

A 20-month-old baby is brought to the Emergency department with a two day history of irritability, fever and non-blanching rash. BP was normal.

What is the likeliest diagnosis?

- 1- H. influenzae
- 2- L. monocytogenes
- 3- N. meningitidis
- 4- S. aureus
- 5- Streptococcus pneumoniae

Answer & Comments

Answer: 3- N. meningitidis

Meningococcal disease is an important cause of severe infection in young infants. Early recognition and treatment is essential for a favourable outcome.

Although other organisms can cause meningitis, N. meningitidis is the likeliest cause.

At 20 months, the infant should have been immunised against H. influenzae serotype B.



[Q: 3867] OnExamination 2012 - Infectious disease

A 24-year-old IV drug abuser presents with jaw spasm to the emergency department. She says she re-used a heroin needle a few days ago and a couple of her sites look infected.

She has suffered recurrent admissions with pneumonia over the past two years and has been using heroin for the past four years.

On examination she is pyrexial 37.8°C. She has jaw spasm, significant neck stiffness and looks in pain. Examination of her groin and left antecubital fossa reveals discharging sinuses from where she has injected heroin previously.

Investigations show

Hb 11.4 g/dl(13.5-18)

WCC $10.8 \times 10^9/L$ (4-10)

PLT $179 \times 10^9/L$ (150-400)

Na 139 mmol/l (134-143)

K 4.5 mmol/l (3.5-5)

Cr 129 $\mu\text{mol/l}$ (60-120)

She is given immunoglobulin.

Which of the following antibiotic treatments is most appropriate in addition?

- 1- Chloramphenicol
- 2- Ciprofloxacin
- 3- Erythromycin
- 4- Metronidazole
- 5- Oxytetracycline

Answer & Comments

Answer: 4- Metronidazole

This woman is suffering from tetanus as a result of infection via a contaminated drug injecting needle.

Initial management of choice is anti-tetanus immunoglobulin, followed in this case by the addition of systemic antibiotics, either metronidazole or benzylpenicillin, and debridement of any wound if required.

Diazepam, neuromuscular blockade, and intubation may all be required during the acute phase.

Over the longer term, muscle spasms and ankle clonus can persist for many months.



[Q: 3868] OnExamination 2012 - Infectious disease

Following your morning surgery, you receive a telephone call from the lab at the local hospital regarding an 82-year-old patient of yours whom you admitted from her nursing home with headache, photophobia and neck stiffness. When you saw her, her temperature was 39.0°C, pulse rate 115 beats/min and

there were no skin rashes or focal neurological signs. Her Glasgow coma scale was 15/15.

Following admission, CSF was obtained and Gram stain showed Gram-negative coccobacilli, subsequent culture confirms a *Haemophilus influenzae* meningitis.

What chemoprophylaxis should be offered to the nurses at her home?

- 1- Azithromycin
- 2- Ceftriaxone
- 3- Ciprofloxacin
- 4- No chemoprophylaxis required
- 5- Rifampicin

Answer & Comments

Answer: 5- Rifampicin

Close contacts of *Haemophilus influenzae* meningitis should receive rifampicin; children under two years should be vaccinated.



[Q: 3869] OnExamination 2012 - Infectious disease

An 18-year-old student presented to hospital two days after returning from visiting family in India.

Within twenty four hours of his return to the United Kingdom he suddenly developed profuse watery diarrhoea. Initially he did not have any nausea, vomiting or stomach cramps, but these developed within a day. He described the diarrhoea as looking like cloudy water but without any blood or mucus. He was opening his bowels over 20 times per day.

On examination he looked pale; he was afebrile. Skin turgor was reduced and mucous membranes were dry.

Stool culture revealed a growth of *Vibrio cholerae*.

Which is the most appropriate antibiotic to administer?

- 1- Ceftriaxone

- 2- Doxycycline
- 3- Meropenem
- 4- Metronidazole
- 5- Piperacillin plus gentamicin

Answer & Comments

Answer: 2- Doxycycline

Cholera has a short incubation period of 24-48 hours.

The illness begins with the sudden onset of painless, watery diarrhoea. The diarrhoea may be accompanied later by abdominal cramps, nausea and vomiting. Patients are usually afebrile. The diarrhoea is typically described as having the appearance of rice water and a faintly fishy smell. The diarrhoea may be copious and result in hypovolaemic shock unless fluids are administered.

The primary aim of treatment is to restore fluid balance; antibiotics have a secondary role. However, antibiotics have been shown to reduce fluid loss and hasten clearance of the organism from the gut.

Appropriate antibiotics include

Tetracycline

Doxycycline

Ciprofloxacin

Erythromycin

Co-trimoxazole.

Tetracycline is usually the first line drug of choice, although resistance is emerging in certain parts of the world.



[Q: 3870] OnExamination 2012 - Infectious disease

A 51-year-old lady presented to hospital with a two day history of malaise and headache.

On the day of admission the headache had become more intense and was associated with pain in her neck.

Her husband reported that she had also been febrile and confused at times. She had previously been well and had no significant past medical history.

On examination, she was febrile 38.1°C, looked unwell and was photophobic. Kernig's and Brudzinski's signs were positive. The fundi were normal with no evidence of papilloedema.

Following a normal CT scan a lumbar puncture was performed and CSF analysis showed:

White cells 200/mm³

Red cells 2/mm³

CSF protein 0.9 g/l (0.15-0.45)

CSF glucose 1.6 mmol/l (3.3-4.4)

Plasma glucose 5.3 mmol/l (3.0-6.0)

What is the most likely causative organism?

- 1- Escherichia coli
- 2- Listeria monocytogenes
- 3- Mycobacterium tuberculosis
- 4- Streptococcus pneumoniae
- 5- Streptococcus pyogenes

Answer & Comments

Answer: 4- Streptococcus pneumoniae

The most common causes of bacterial meningitis in persons over 50 years of age are:

Streptococcus pneumoniae

Neisseria meningitidis

Listeria monocytogenes

Gram negative bacilli.

Although this question tries to establish whether candidates are aware of the most common cause of meningitis in this group,

some questions in the examination give additional clues as to the cause of meningitis.

Physical examination may provide clues to the aetiology of meningitis in affected patients:

Morbilloform rash with pharyngitis and lymphadenopathy may suggest a viral aetiology (Epstein-Barr virus [EBV], cytomegalovirus [CMV], adenovirus, human immunodeficiency virus [HIV]).

Macules and petechiae that rapidly evolve into purpura suggest meningococcaemia (with or without meningitis).

Vesicular lesions in a dermatomal distribution suggest Varicella zoster virus.

Genital vesicles suggest Herpes simplex virus (HSV)-2 meningitis.

Sinusitis or otitis suggest direct extension into the meninges, usually with Streptococcus pneumoniae and Haemophilus influenzae.

Rhinorrhoea or otorrhoea suggest a cerebrospinal fluid (CSF) leak from a basilar skull fracture, with meningitis most commonly caused by Streptococcus pneumoniae.

Hepatosplenomegaly and lymphadenopathy suggest a systemic disease, including viral (for example, mononucleosis-like syndrome in EBV, CMV, and HIV) and fungal (for example, disseminated histoplasmosis) disease.

The presence of a murmur suggests infective endocarditis with secondary bacterial seeding of the meninges.

Evidence of parotitis is observed in some cases of mumps meningitis.

Kernig's sign (pdf)

In a supine patient, flex the hip to 90° while the knee is flexed at 90°. An attempt to further extend the knee produces pain in the hamstrings and resistance to further extension.

Brudzinski's sign (pdf)

Passively flex the neck while the patient is in a supine position with extremities extended. This manoeuvre produces flexion of the hips in patients with meningeal irritation.



[Q: 3871] OnExamination 2012 - Infectious disease

A 17-year-old male presented to casualty complaining of difficulty breathing. He had been brought to hospital by ambulance, having collapsed shortly after being stung on the hand by a bee.

On examination, his blood pressure was 80/40 mmHg, and facial swelling was noted.

Which one of the following investigations is most likely to confirm the nature of the reaction?

- 1- Haemolytic complement (CH50) level
- 2- Plasma tryptase activity
- 3- Serum complement C3 level
- 4- Serum total IgE level
- 5- Serum venom-specific IgE level

Answer & Comments

Answer: 2- Plasma tryptase activity

Type I hypersensitivity, also known as immediate or anaphylactic hypersensitivity, usually takes 15 - 30 minutes from the time of exposure to the antigen. The reaction may cause a range of symptoms from minor inconvenience to death.

The reaction involves preferential production of IgE in response to certain antigens which in turn initiates a sequence of events leading to the release of various pharmacologically active substances that are responsible for the clinical features.

Diagnostic tests include skin tests, measurement of total IgE and specific IgE antibodies against the suspected allergens. However, this question asks which of the

following tests would provide confirmatory information and that would be tryptase.

Tryptase is a neutral protease stored in mast cell secretory granules that is secreted by human mast cells. Levels in normal blood are undetectable (< 1 ng/ml). Elevated serum levels demonstrate that mast cell activation with mediator release has occurred whether triggered by IgE-mediated anaphylaxis or non-IgE-mediated anaphylactoid reactions. The greater the severity of anaphylaxis, the more likely that serum -tryptase levels will be elevated.



[Q: 3872] OnExamination 2012 - Infectious disease

You are considering starting a patient on griseofulvin.

Which of the following statements concerning its pharmacology is true?

- 1- It is active against Aspergillus
- 2- It is active against Candida albicans
- 3- It is associated with drug-induced Stevens-Johnson syndrome
- 4- It is used for a maximum of two weeks
- 5- It should not be used in renal failure

Answer & Comments

Answer: 3- It is associated with drug-induced Stevens-Johnson syndrome

For griseofulvin and Stevens-Johnson syndrome read Am J Emerg Med 1984;2:129-135. Many other drugs are implicated in causing Stevens-Johnson syndrome.

Griseofulvin is not active against Candida albicans. It is active against trichophytons (tinea) and other dermatophytes.

It is metabolised in the liver (note also, it is an enzyme inducer). Only 0.1-0.2% is excreted in urine.

Treatment with griseofulvin is often needed for a long period, sometimes years, depending on the rate of nail growth.



[Q: 3873] OnExamination 2012 - Infectious disease

An 87-year-old woman was referred to clinic with a two month history of alternating constipation and diarrhoea, night sweats and fatigue. The patient was not sure if she had lost any weight.

On examination she appeared thin and pale. Her pulse was 80/minute and regular. A systolic murmur was audible at the apex, radiating to the axilla. No diastolic murmurs were heard.

Investigations revealed blood cultures to be positive, and transthoracic echocardiogram revealed a vegetation on the mitral valve.

What is the most likely causative organism in this case?

- 1- Coagulase-negative Staphylococcus
- 2- Staphylococcus aureus
- 3- Streptococcus bovis
- 4- Streptococcus mitis
- 5- Streptococcus viridans

Answer & Comments

Answer: 3- Streptococcus bovis

This patient has endocarditis.

In addition to the symptoms that might be attributed to endocarditis (fatigue, night sweats), she also has a history of altered bowel habit that is very suggestive of an underlying malignancy.

Streptococcus bovis is a normal commensal of the gastrointestinal (GI) tract. However, S. bovis bacteraemia and endocarditis have a strong association with GI malignancy.

Coagulase-negative staphylococcal endocarditis is exceptionally rare in native

valve endocarditis, though it is the commonest cause of prosthetic valve endocarditis in the postoperative period.

Staphylococcus aureus endocarditis is typically the result of a focus of staphylococcal infection (for example, skin abscess).

Streptococcus mitis endocarditis and viridans streptococci (which include S. mitis) are normal commensals of the oropharynx and GI tract.

Endocarditis is usually associated with poor dental hygiene; overall, Streptococcus viridans accounts for ~40% of cases of endocarditis.



[Q: 3874] OnExamination 2012 - Infectious disease

Which of the following is a feature of vancomycin-resistant enterococci?

- 1- Cause resistant infective diarrhoea
- 2- Produce an enzyme that inactivates vancomycin
- 3- May be found in healthy community volunteers not recently hospitalised
- 4- High dose ampicillin is the treatment of choice
- 5- Are commonly vancomycin-dependent

Answer & Comments

Answer: 3- May be found in healthy community volunteers not recently hospitalised

A. When they cause clinical problems they are usually urinary tract infections (UTI), bacteraemia, wound infections, neonatal infections, endocarditis, etc.

B. They alter peptidoglycan precursors used to build cell walls. Vancomycin binds to D-alanyl-D-alanine but the resistant enterococci have D-alanyl-D-lactate or D-alanine terminating precursors. They acquire genes that produce enzymes to change the precursors.

C. Two per cent in the United Kingdom general practice, 28% in Belgium. Community reservoir in meat, poultry and perhaps cheese.

D. Only if the MIC (minimum inhibitory concentration) of ampicillin is not too high. Anecdotal evidence exists for its use in *E. faecalis* endocarditis. (20g / day).

E. Some strains only. An explanation for this curious process is that there is an inability to produce cell walls because the vancomycin-sensitive precursor genes have been turned off and the resistant ones only appear in the presence of vancomycin.

(Source: *Am J Med* 1997;102:284-293)



[Q: 3875] OnExamination 2012 - Infectious disease

You review a 30-year-old HIV positive man with *Pneumocystis carinii* pneumonia (PCP).

Blood gases reveal a pO_2 of 55 mmHg (75-100) whilst breathing 28% oxygen.

Which of the following would be indicated in the treatment?

- 1- Atovaquone
- 2- Clindamycin
- 3- Leucovorin
- 4- Pentamidine
- 5- Trimethoprim-sulphamethoxazole

Answer & Comments

Answer: 5- Trimethoprim-sulphamethoxazole

This patient has severe PCP as suggested by the hypoxia (pO_2 less than 70). He should be treated with high percentage oxygen and the drug of choice is high dose IV co-trimoxazole (trimethoprim-sulphamethoxazole).

If allergic to co-trimoxazole, IV pentamidine or clindamycin are appropriate.

IV leucovorin and oral atovaquone are further options but are not first line therapies.

Prednisolone has been shown to reduce mortality substantially in patients with a PO_2 <60 mmHg.



[Q: 3876] OnExamination 2012 - Infectious disease

A 32-year-old woman complains of an offensive clear yellow vaginal discharge, with associated vulval itch and soreness. She admits to beginning a relationship with a new partner some four weeks earlier.

On examination her vulva looks slightly erythematous and there is a clear discharge that has a fishy odour.

Which of the following is the most likely diagnosis?

- 1- Bacterial vaginosis
- 2- *C. trachomatis*
- 3- Herpes simplex infection
- 4- *N. gonorrhoeae*
- 5- *T. vaginalis*

Answer & Comments

Answer: 5- *T. vaginalis*

The answer is E, *T. vaginalis*.

The clinical picture described fits entirely with infection with the anaerobic flagellated protozoan *Trichomonas vaginalis*.

Trichomoniasis differs from non-infective vaginosis, with respect to a yellowish colour to the discharge and associated vulval irritation.

A large dose of metronidazole (2 g as a single course), or a seven day course at lower dose is the treatment of choice. Patients should of course also be screened for other sexually transmitted infections.

Partners should be identified and also screened for infection as men rarely exhibit symptoms of a *T. vaginalis* infection.

The epithelial damage caused by *T. vaginalis* increases susceptibility to HIV virus infection and transmission.

Whilst bacterial vaginosis is also associated with a discharge with a fishy odour, classically there is no soreness or irritation associated with it.



[Q: 3877] OnExamination 2012 - Infectious disease

A 31-year-old African man presented with a history of fever, night sweats, shortness of breath and weight loss for two months. His chest radiograph showed a moderately severe left pleural effusion only. He consented to an HIV test which was positive.

What is the most likely cause of pleural effusion?

- 1- Hodgkin's lymphoma
- 2- Pleural tuberculosis
- 3- Pneumocystis jirovecii pneumonia (PCP)
- 4- Pulmonary aspergillosis
- 5- Pulmonary Kaposi's sarcoma

Answer & Comments

Answer: 2- Pleural tuberculosis

Pleural tuberculosis is the most likely cause in an HIV positive African man with a two month history of weight loss. His pleural effusion is due to pleural tuberculosis (extra pulmonary tuberculosis).

Hodgkin's lymphoma can cause pleural effusion due to pleural involvement but it is often associated with mediastinal mass. His chest radiograph showed only pleural effusion. Non-Hodgkin's lymphoma (not Hodgkin's lymphoma) is commonly associated with these patients.

PCP does not cause pleural effusion. It typically causes bilateral reticular shadows

from the hila without any hilar lymph node enlargement or pleural effusion.

Pulmonary aspergillosis shows infiltrative lesions but it does not typically cause pleural effusion.

Pulmonary Kaposi's sarcoma can cause pleural effusion by involving the pleura, but it often causes coarse irregular nodular lesions in the lungs.

Reference:

El-Gadi SM, Banks J, Yoganathan K. Kaposi sarcoma presenting as severe haemoptysis. Genitourin Med. 1997 Dec; 73(6): 575-6.



[Q: 3878] OnExamination 2012 - Infectious disease

A young girl returns from a trip to India with a protracted history of watery diarrhoea.

Giardiasis is suspected but three stool samples are negative.

What is the best investigation to confirm Giardia as a diagnosis?

- 1- CT abdomen
- 2- Rectal biopsy
- 3- Serum IgM Giardia antibodies
- 4- Small intestine biopsy
- 5- Stool microscopy

Answer & Comments

Answer: 4- Small intestine biopsy

Giardia may be difficult to diagnose from stool samples alone. Concentration techniques and optimising sample preparation may improve stool sample yield.

However, parasitic antigen detection in stool is at least as sensitive and specific as good microscopic examination of stool, and may be easier to perform.

In this case detection of Giardia may be achieved by sampling of duodenal fluid, or small bowel biopsy.



[Q: 3879] OnExamination 2012 - Infectious disease

Three elderly patients presented with cough, fever and general malaise on return from holiday to Spain.

The group of 50 had travelled together, engaging in visits to hillside forestry, and fishing in mountain streams. They had been housed in different hotels. The three people who presented with illness all stayed in the same hotel.

Which of the following organisms is most likely to be responsible for their illness?

- 1- Borrelia burgdorferi
- 2- Legionella pneumophila
- 3- Leptospira icterohaemorrhagiae
- 4- Mycoplasma pneumoniae
- 5- Pneumococcus

Answer & Comments

Answer: 2- Legionella pneumophila

This is a typical story for legionnaires' disease caused by Legionella pneumophila.

The condition was described first in a veteran's legion conference in a similar fashion to the above description.

Contaminated air conditioning units are often to blame.

Weil's disease is unlikely given the story as is Lyme disease (Borrelia burgdorferi).



[Q: 3880] OnExamination 2012 - Infectious disease

A 56-year-old man diagnosed with systemic inflammatory response syndrome (SIRS)

secondary to pneumonia is admitted to the high dependency unit.

On examination, he has a temperature of 39°C, a respiratory rate of 30/min, has a pulse of 109 beats/min and a blood pressure of 89/74 mmHg despite receiving IV fluids and urine output of 25 ml/hour after catheterisation.

Which of the following should be instituted immediately and should be accomplished within the first six hours of presentation?

- 1- Administer drotrecogin alfa (activated protein C)
- 2- Administer intravenous furosemide
- 3- Administer low dose steroids
- 4- Institute tight glucose control
- 5- Obtain blood cultures prior to antibiotic administration

Answer & Comments

Answer: 5- Obtain blood cultures prior to antibiotic administration

The Surviving Sepsis Campaign (a partnership of the Society of Critical Care Medicine, the European Society of Intensive Care Medicine, and the International Sepsis Forum) has teamed up with the Institute for Healthcare Improvement to develop severe sepsis bundles. A 'bundle' is a group of interventions related to a disease process that, when executed together, result in better outcomes than when implemented individually.

Sepsis Resuscitation Bundle

(Should begin immediately, but must be accomplished within the first six hours of presentation.)

Serum lactate measured.

Blood cultures obtained prior to antibiotic administration.

From the time of presentation, broad-spectrum antibiotics administered within

three hours for ED admissions and one hour for non-ED ICU admissions.

In the event of hypotension and/or lactate > 4 mmol/l (36 mg/dl):

Deliver an initial minimum of 20 ml/kg of crystalloid (or colloid equivalent).

Apply vasopressors for hypotension not responding to initial fluid resuscitation to maintain mean arterial pressure (MAP) > 65 mm Hg.

In the event of persistent hypotension despite fluid resuscitation (septic shock) and/or lactate > 4 mmol/l (36 mg/dl):

Achieve central venous pressure (CVP) of > 8 mm Hg.

Achieve central venous oxygen saturation (ScvO₂) of > 70%.

Sepsis Management Bundle

(To be accomplished as soon as possible may be completed within twenty-four hours of presentation.)

Low-dose steroids administered for septic shock in accordance with a standardised ICU policy.

Glucose control maintained > lower limit of normal, but < 150 mg/dl (8.3 mmol/l).

Inspiratory plateau pressures maintained < 30 cm H₂O for mechanically ventilated patients

Drotrectogin alpha (activated protein C) used to be recommended by NICE for the treatment of severe sepsis. However, in October 2011 the company withdrew this from the market following the results of the PROWESS-SHOCK study, which showed there was no statistically significant reduction in 28-day all-cause mortality in patients with septic shock.



[Q: 3881] OnExamination 2012 - Infectious disease

During an outbreak of influenza A, which of the following may provide appropriate prophylaxis for healthcare workers?

- 1- Amantadine
- 2- Ganciclovir
- 3- Lamivudine
- 4- Oseltamivir
- 5- Zidovudine

Answer & Comments

Answer: 4- Oseltamivir

Oseltamivir (Tamiflu) may be used in the prophylactic treatment of healthcare workers during flu epidemics.

However, long term treatment does run a risk of resistance.



[Q: 3882] OnExamination 2012 - Infectious disease

Transplacental transmission of all of the following organisms is a recognised cause of fetal malformations and disease except which of the following?

- 1- Cytomegalovirus
- 2- Mumps
- 3- Rubella
- 4- Toxoplasma gondii
- 5- Varicella zoster virus

Answer & Comments

Answer: 2- Mumps

Cytomegalovirus in pregnancy can cause fetal abnormalities or abortion.

Varicella is rare in pregnancy but can be severe and cause intrauterine death of the fetus.

Congenital toxoplasmosis usually results from an acute maternal infection during pregnancy.

Measles and mumps cause only mild maternal infection and do not pose a serious problem to the fetus.



[Q: 3883] OnExamination 2012 - Infectious disease

A 42-year-old man with advanced HIV disease presented with a tonic-clonic seizure. He had been diagnosed with HIV 10 years previously, but had elected not to take antiretroviral therapy.

A CT scan of his brain showed a 2 cm ring-enhancing lesion in the right parietal lobe.

What is the probable causative agent?

- 1- Cryptococcus neoformans
- 2- Mycobacterium avium intracellulare
- 3- Mycobacterium tuberculosis
- 4- Pneumocystis carinii
- 5- Toxoplasma gondii

Answer & Comments

Answer: 5- Toxoplasma gondii

This is a typical presentation with AIDS-related cerebral toxoplasmosis.

The differential diagnosis of ring-enhancing lesions on CT in a patient with AIDS include:

Cerebral toxoplasmosis

Abscesses

Metastases

Atypical CNS lymphoma.

Cryptococcus typically causes a meningitis.

CNS infections with the remaining organisms are rare in AIDS.



[Q: 3884] OnExamination 2012 - Infectious disease

Which of the following is true of the antibiotic combination quinupristin and dalbapristin?

- 1- Administered orally.
- 2- Effective against multi-resistant Staph. aureus
- 3- Effective against resistant mycobacterium TB.
- 4- Indicated in subjects with chronic renal impairment.
- 5- Particularly effective in the treatment of Pseudomonas infection in cystic fibrosis.

Answer & Comments

Answer: 2- Effective against multi-resistant Staph. aureus

Quinupristin and dalbapristin are a synergistic combination of a streptogramin A and B respectively.

They are effective against Gram positive aerobes and are particularly useful against resistant Strep. pneumoniae and Staph. aureus.

They can be administered only via a central line.



[Q: 3885] OnExamination 2012 - Infectious disease

You are an occupational health physician and have been asked by an anxious employee about contraindications to pertussis immunisation.

Which of the following is a contraindication?

- 1- Cow's milk protein intolerance.
- 2- Eczema
- 3- Fever to 39.5°C following the first dose.
- 4- Hydrocephalus
- 5- Redness of >2.5cm at the injection site after the first dose.

Answer & Comments

Answer: 3- Fever to 39.5°C following the first dose.

True contraindications to pertussis immunisation include:

Acute illness - until recovered

Previous reaction to pertussis:

Local: an extensive area of redness and swelling which becomes indurated, involving most of the anterolateral surface of the thigh or a major part of the circumference of the upper arm

General: fever equal to or more than 39.5°C within 48 hours of vaccine, anaphylaxis, bronchospasm, laryngeal oedema, generalised collapse, prolonged hyporesponsiveness, prolonged inconsolable or high-pitched screaming of more than four hours, convulsions or encephalopathy occurring within 72 hours.

A personal family history of allergy is not a contraindication, nor are stable neurological conditions such as cerebral palsy or spina bifida.

In patients who have had a previous reaction, immunisations should be completed with DT vaccine, and acellular vaccine considered.



[Q: 3886] OnExamination 2012 - Infectious disease

A 19-year-old man returned to the United Kingdom two weeks after working in a refugee camp in sub-Saharan Africa.

On examination he was febrile, dyspnoeic and widespread inspiratory crackles were present. He had an extensive maculo-papular rash, conjunctivitis, generalised stomatitis and some bluish-grey spots on the buccal mucosa.

What is the most likely diagnosis?

- 1- Epidemic typhus
- 2- Epstein-Barr virus infection

3- Leptospirosis

4- Measles

5- Parvovirus infection

Answer & Comments

Answer: 4- Measles

Although seldom seen in countries in which a vaccine is available, measles is a major health problem in refugee camps in Africa.

The clinical picture described is characteristic.

The major complications of measles involve the respiratory tract and central nervous system.

Pneumonia may be caused by the virus itself or through bacterial superinfection.



[Q: 3887] OnExamination 2012 - Infectious disease

A 72-year-old female presents with a two month history of poor appetite, lethargy, intermittent fever and night sweats. She has poor dentition and over the last 12 months has required dental extraction.

On examination, a murmur consistent with mitral regurgitation is heard. A transthoracic echocardiogram reveals a vegetation on the mitral valve.

What is the likeliest cause of her endocarditis?

- 1- C. burnetii
- 2- E. faecalis
- 3- MRSA
- 4- S. aureus
- 5- S. mutans

Answer & Comments

Answer: 5- S. mutans

S. mutans is a member of the viridans Streptococcus group and a common cause of bacterial endocarditis.

Poor dentition and procedures such as dental extraction are associated with transient viridans streptococcal bacteraemia.

In the presence of a pre-existing cardiac lesion this may have caused infective endocarditis.



[Q: 3888] OnExamination 2012 - Infectious disease

A 72-year-old male presents with a two month history of poor appetite, lethargy, intermittent fever and night sweats. Four months previously he had undergone TURP for benign prostatic hypertrophy.

On examination a murmur consistent with mitral regurgitation is heard. A transthoracic echocardiogram reveals a vegetation on the mitral valve.

What is the likeliest cause of his endocarditis?

- 1- C. burnetii
- 2- E. faecalis
- 3- MRSA
- 4- S. aureus
- 5- S. mutans

Answer & Comments

Answer: 2- E. faecalis

E. faecalis is a common cause of bacterial endocarditis following a urological procedure.

Urological procedures, such as transurethral resection of the prostate (TURP), may cause a transient E. faecalis bacteraemia.

In the presence of a pre-existing cardiac lesion this may have caused infective endocarditis.



[Q: 3889] OnExamination 2012 - Infectious disease

A 21-year-old man returns from a trip to Spain with a group of male friends, complaining of pus-like urethral discharge and pain on passing urine. He admits to unprotected sex

with three different female partners during the course of the holiday.

On examination he is afebrile, his BP is 115/70 mmHg, and his pulse is 70 and regular. Respiratory and abdominal examinations are unremarkable.

You can easily express pus-like discharge from his urethral meatus.

Investigations show:

Haemoglobin 13.9 g/dl (13.5-17.7)

White cell count $9.6 \times 10^9/L$ (4-11)

Platelets $282 \times 10^9/L$ (150-400)

Serum Sodium 139 mmol/l (135-146)

Serum Potassium 4.4 mmol/l (3.5-5)

Creatinine 88 micromol/l (79-118)

Microscopy of pus sample Gram negative diplococci

Which of the following is the most appropriate treatment for him?

- 1- Ceftriaxone 250 mg IM as a single dose
- 2- Ciprofloxacin 500 mg BD for 7 days
- 3- Clarithromycin 500 mg PO BD for 7 days
- 4- Doxycycline 100 mg PO daily for 7 days
- 5- Penicillin V 500 mg PO for 7 days

Answer & Comments

Answer: 1- Ceftriaxone 250 mg IM as a single dose

The answer is A, ceftriaxone 250 mg IM as a single dose.

Due to questions of compliance and the need for definitive treatment, the optimal way to deliver treatment for gonorrhoea is with one IM injection.

This patient will also require referral to the local GUM clinic for a full sexual health screen to rule out co-existent pathogens apart from gonococcus.



[Q: 3890] OnExamination 2012 -
Infectious disease

A 32-year-old woman comes to the clinic. She complains of very foul smelling diarrhoea, abdominal bloating and excessive flatulence some two weeks after returning from a holiday to Mauritius with her husband. They admit to having eaten food from street vendors on a number of occasions during the course of the holiday.

On examination her BP is 122/72 mmHg, there is no postural drop. Her pulse is 70 and regular. Respiratory examination is normal and abdominal examination reveals a soft but mildly distended abdomen, with active bowel sounds.

Investigations show

Haemoglobin 11.8 g/dl(11.5-16.5)

White cells $8.9 \times 10^9/L$ (4-11)

Platelets $192 \times 10^9/L$ (150-400)

Sodium 140 mmol/l (135-146)

Potassium 4.0 mmol/l (3.5-5)

Creatinine 110 $\mu\text{mol/l}$ (79-118)

Albumin 40 g/l (35-50)

Which of the following is the most likely diagnosis?

- 1- Campylobacter
- 2- Giardiasis
- 3- Salmonella
- 4- Shigella
- 5- Tropical sprue

Answer & Comments

Answer: 2- Giardiasis

This patient's history is consistent with Giardia lamblia infection, particularly with respect to her abdominal bloating, diarrhoea, and excess production of gas.

It is transmitted via the faecal oral route, and she is likely to have picked up the infection from eating food from a street vendor.

Diagnosis was traditionally based on stool microscopy looking for trophozoites or cysts, but antigen tests are now also available.

The infection responds to treatment with either metronidazole or tinidazole, and once treated does not usually recur.



[Q: 3891] OnExamination 2012 -
Infectious disease

A 27-year-old man presents with pulmonary tuberculosis. He was released from a Chinese jail where he was a prisoner for some six years and has now applied for residency in the United Kingdom.

On examination you notice that he has a number of violaceous plaques on both lower limbs. Oral candidiasis is also present.

Investigations show:

Haemoglobin 11.4 g/dl(13.5-18)

White cell count $4.2 \times 10^9/L$ (4-10)

Platelets $195 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (134-143)

Potassium 4.2 mmol/l (3.5-5)

Creatinine 120 $\mu\text{mol/l}$ (60-120)

Which of the following is the most likely cause of his skin changes?

- 1- Cocksackie B
- 2- Herpes zoster
- 3- Human herpes virus 6
- 4- Human herpes virus 8
- 5- Human papilloma virus

Answer & Comments

Answer: 4- Human herpes virus 8

The skin condition that this patient is suffering from is suggestive of Kaposi's sarcoma in a

patient with HIV infection (pulmonary tuberculosis and oral candidiasis).

HHV-8 DNA was first sequenced from Kaposi's in the early '90s. Human herpes virus 8 is also associated with primary effusion lymphoma (a rare lymphoma of serous cavities) and Castleman's disease.

AIDS-related Kaposi's sarcoma becomes smaller as immune function improves such as with treatment with highly active antiretroviral therapy (HAART).

In some circumstances chemotherapy may be added to HAART. Radiotherapy may be used to treat painful or highly visible lesions.



[Q: 3892] OnExamination 2012 - Infectious disease

A 48-year-old African man with HIV was prescribed a combination of antiretroviral therapy. He developed increased diffuse pigmentation of the nails in both hands and toes.

What is the most likely cause of the increased pigmentation of the nails?

- 1- Efavirenz
- 2- Lamivudine
- 3- Nevirapine
- 4- Tenofovir
- 5- Zidovudine

Answer & Comments

Answer: 5- Zidovudine

Zidovudine causes increased pigmentation of the nails in black patients.

Efavirenz causes central nervous system toxicity not hyperpigmentation.

Lamivudine does not normally cause hyperpigmentation of nails but it can occasionally cause hyperpigmentation of the skin in black people.

Nevirapine does not cause hyperpigmentation of skin but can cause acute hepatitis and skin rash.

Tenofovir can cause proximal tubular damage hence Fanconi-like syndrome.

Reference:

Furth PA, Kazakis AM. Nail pigmentation changes associated with azidothymidine (zidovudine). *Ann Intern Med.* 1987 Sep; 107(3): 350.



[Q: 3893] OnExamination 2012 - Infectious disease

A 47-year-old man presents with progressive right hand swelling two days after being bitten by a dog.

On examination there is a puncture wound with pus over the dorsum of the hand, cellulitis, ascending lymphangitis and tender axillary lymphadenopathy.

What is the most appropriate antibiotics therapy in this case?

- 1- Benzylpenicillin and flucloxacillin
- 2- Ceftriaxone
- 3- Ciprofloxacin
- 4- Co-amoxiclav
- 5- Erythromycin

Answer & Comments

Answer: 4- Co-amoxiclav

Only 15-20% of dog bites become infected, and providing the wound is appropriately cleaned and not considered at risk (for example, crush or deep wounds) then antibiotic prophylaxis may not be required.

However, this patient has an infected wound, and infective organisms include *Pasteurella* spp, *Staph. aureus* and anaerobes like *Corynebacterium*.

The most appropriate antibiotic therapy in dog bites associated with cellulitis would be co-amoxiclav.



[Q: 3894] OnExamination 2012 - Infectious disease

A 35-year-old man presented with cellulitis of his right leg.

On examination he was mildly confused and febrile (40.1°C) with a pulse of 120/minute and BP 80/55 mmHg.

He was treated with intravenous benzylpenicillin and flucloxacillin. Group A Streptococcus was isolated from two sets of blood cultures. There was no significant clinical improvement after 24 hours.

What antibiotic should be added?

- 1- Ciprofloxacin
- 2- Clindamycin
- 3- Gentamicin
- 4- Rifampicin
- 5- Vancomycin

Answer & Comments

Answer: 2- Clindamycin

The patient has a severe cellulitis with features of streptococcal toxic shock syndrome (TSS). Streptococcal TSS is mediated via streptococcal exotoxins.

Although clindamycin is a bacteriostatic antibiotic, it acts by switching off protein synthesis within bacteria; this in turn will lead to decreased exotoxin expression, thereby removing the mediators of TSS.



[Q: 3895] OnExamination 2012 - Infectious disease

A 43-year-old male presents with right iliac fossa pain and bloody diarrhoea for two days.

He had a fever, headache and myalgia the day before diarrhoeal illness. He is passing liquid bloody stools 10 times daily.

He has a history of HIV and is on HAART. His CD4 count has been well controlled, above 400 cells/μl.

What is the cause for his diarrhoea?

- 1- Appendicitis
- 2- Antiretroviral medication
- 3- Campylobacter
- 4- Cryptosporidium parvum
- 5- Cytomegalovirus

Answer & Comments

Answer: 3- Campylobacter

Campylobacter infection usually presents with bloody diarrhoea and 'pseudoappendicitis' (RIF pain). The patients often have a prodrome of fever, headache and myalgia. Campylobacter takes around seven to 10 days to incubate.

Both Cryptosporidium and Cytomegalovirus are found in patients with CD4 count less than 300 cells/μl. It causes chronic diarrhoea (more than four week's duration).

Patients commencing on antiretroviral medication may suffer with diarrhoea. It usually is self-limiting, lasting two to four weeks, and would not be associated with prodrome as in this case.

Given this gentleman's HIV status an infective cause for his diarrhoea is more likely than appendicitis.



[Q: 3896] OnExamination 2012 - Infectious disease

Which of the following is true of the the T cell response to antigen?

- 1- A process of affinity maturation of the T cell receptor occurs.
- 2- Intact antigen is presented in association with self MHC molecules.
- 3- Co-operation with other cell types is required for T cell recognition of antigen.

- 4- Gamma/delta + T cells respond to antigen presented in association with MHC class II molecules.
- 5- Interactions of the TcR with an appropriate Ag/MHC complex activates a resting T cell.

Answer & Comments

Answer: 3- Co-operation with other cell types is required for T cell recognition of antigen.

A. Affinity maturation in an ongoing immune response is a feature of the antibody response. There is no evidence that a similar process occurs in the T cell response.

B. Major histocompatibility complex (MHC) molecules present short antigen-derived peptides, not the intact antigen.

C. T cells recognise antigen only when presented by (self) MHC molecules on an antigen presenting cell.

D. MHC class II molecules present antigen to CD4+, alpha/beta+ T cells. It is still not clear how gamma/delta+ T cells recognise antigen, however most gamma/delta+ T cells do not appear to be restricted by (self) MHC molecules.

E. Additional 'costimulatory' signals are required to activate a resting T cell. Interaction of the T cell receptor (TcR) of a resting T cell with an appropriate Ag/MHC complex in the absence of costimulatory signals may lead to the induction of anergy.



[Q: 3897] OnExamination 2012 - Infectious disease

A 20-year-old woman presented with a solitary, crusted, thickened lesion on her face one month after returning from a holiday in Central America.

What is the most likely diagnosis?

- 1- Cutaneous anthrax
- 2- Cutaneous leishmaniasis

- 3- Impetigo
- 4- Leprosy
- 5- Onchocerciasis

Answer & Comments

Answer: 2- Cutaneous leishmaniasis

The patient has American ('New World') cutaneous leishmaniasis.

The causative agents are of the Leishmania species, including L. braziliensis, L. mexicana, L. panamensis and others.

The incubation period is very variable ranging from two weeks to several months.

A variety of clinical manifestations are described, including single or multiple lesions or mucosal disease (espundia). Lesions usually occur on sun-exposed areas.

Treatment is usually with pentavalent antimonial drugs.



[Q: 3898] OnExamination 2012 - Infectious disease

A 25-year-old male presents with fever, malaise and lethargy two weeks after visiting family in India.

A blood film for malaria parasites is reported as negative.

What is the next most appropriate investigation?

- 1- Blood culture
- 2- Chest x ray
- 3- Interferon gamma releasing assay (IGRA)
- 4- Urine culture
- 5- Widal test

Answer & Comments

Answer: 1- Blood culture

After malaria, enteric fevers are important to exclude.

Blood cultures are the most important investigation for enteric fevers caused by *Salmonella typhi* or *S. paratyphi*.

The Widal test, a demonstration of agglutinating antibodies against somatic O and flagella H antigen of *Salmonella* species is non-specific and, therefore, less reliable.



[Q: 3899] OnExamination 2012 - Infectious disease

A 17-year-old girl presents with three day history of vaginal discharge and pruritis.

What is the most likely causative organism?

- 1- Bacterial vaginosis
- 2- *Candida albicans*
- 3- *Chlamydia trachomatis*
- 4- *Neisseria gonorrhoeae*
- 5- *Trichomonas vaginalis*

Answer & Comments

Answer: 2- *Candida albicans*

There is very little information given in this girl's case, save for the three day history of vaginal discharge.

There is no information given with regard to pruritus, sexual exposure or whether the discharge is malodorous.

Without this information you must consider the most likely organism as a cause of a vaginal discharge with few other symptoms, which is *Candida*.

You may feel this question is unfair but it reflects the questions in the examination that are 'probability' based.



[Q: 3900] OnExamination 2012 - Infectious disease

A 72-year-old gentleman presents with increasing shortness of breath, fever and cough.

A chest x ray shows findings consistent with a right middle lobe pneumonia.

Which factor is associated with a worse prognosis?

- 1- Blood pressure of 120/80 mmHg
- 2- Respiratory rate of 18/min
- 3- Temperature of 37.2
- 4- Urea of 18 mmol/l
- 5- White cell count of 15×10^9

Answer & Comments

Answer: 4- Urea of 18 mmol/l

LBTS guidelines suggest

Increasing age

Co-morbidity

Respiratory rate above 30/min

BP less than 90 systolic

Hypoxaemia

WCC <4 or $>20 \times 10^9/L$ ($4-11 \times 10^9$)

Chest radiographic signs

Positive blood cultures

Confusion and

Urea above 7 mmol/l

are indicators of a worse prognosis associated with community acquired pneumonia.



[Q: 3901] OnExamination 2012 - Infectious disease

A 45-year-old woman was diagnosed with bacterial endocarditis.

What is the characteristic fundoscopic feature of this disease?

- 1- Cherry red macula
- 2- Janeway lesions
- 3- Macular star

4- Retinal artery aneurysms

5- Roth's spots

Answer & Comments

Answer: 5- Roth's spots

Roth's spots are the fundoscopic hallmark of bacterial endocarditis. They are white-centred retinal haemorrhages, caused by capillary fragility. In addition to subacute bacterial endocarditis, they can also be seen in leukaemia and retinal ischaemia.

Other peripheral features of endocarditis include Osler's nodes (tender subcutaneous nodules caused by immune complex deposition), and Janeway lesions (painless erythematous or haemorrhagic macular or papular lesions, on the palms and soles, caused by infective emboli in the skin).

A cherry-red spot on the macula is characteristic of central retinal artery occlusion. It is seen due to relative pallor of the surrounding retina.

A macular star is caused by deposits of hard exudate (usually lipid) within the fibre layer of the retina, radiating out in a star-like pattern. It can occur in a number of conditions, including hypertensive retinopathy and neuroretinitis.

Retinal artery aneurysms develop with age, and can be associated with hypertension. They are usually benign, but can result in macular haemorrhage, exudate or oedema, or vitreous haemorrhage.



[Q: 3902] OnExamination 2012 - Infectious disease

A 14-year-old boy presents with fever.

Which of the following might contribute to a diagnosis of rheumatic fever?

1- A CRP of 10

2- A prolonged PR interval on ECG

3- Finding target lesions on the hands

4- Finding tender nodules in the fingertips

5- Positive Romberg's sign

Answer & Comments

Answer: 2- A prolonged PR interval on ECG

The modified Jones criteria include:

Finding of preceding streptococcal infection (recent scarlet fever, raised ASOT or other streptococcal antibodies)

Positive throat swab for Group A Strep.

Plus:

(a) Major Criteria:

- Carditis
- Polyarthritides
- Chorea
- Subcutaneous nodules
- Erythema marginatum.

(b) Minor Criteria:

- Fever
- Arthralgia
- Previous history of rheumatic fever
- Elevated acute phase reactions
- Prolonged PR interval.

Erythema marginatum involves red circular lesions which gradually enlarge with central clearing.

Sydenham's chorea consists of choreoathetoid movements with increased clumsiness, for example, deteriorating handwriting. This is often associated with emotional lability.

Target lesions suggest erythema multiforme.

A C reactive protein (CRP) of 10 is not elevated much beyond the normal range.

Erythema marginatum initially manifests as non-specific pink macules seen over the trunk, with later blanching in the middle of the lesions and sometimes fusing of the borders resulting in a serpiginous (serpent-like) looking lesion. The rash is worsened with heat, but is characteristically evanescent. It does not itch, and can be mistaken for the rash of Lyme disease.

Sub-cutaneous nodules are pea-sized, firm and non-tender. There is no associated inflammation and they are characteristically seen on the extensor surfaces of joints such as knees and elbows and also over the spine.



[Q: 3903] OnExamination 2012 - Infectious disease

A 16-year-old boy from India presents with fever of four months duration and splenomegaly.

What is the most likely diagnosis?

- 1- Coccidioidomycosis
- 2- Giardiasis
- 3- Tropical sprue
- 4- Typhoid
- 5- Visceral leishmaniasis

Answer & Comments

Answer: 5- Visceral leishmaniasis

Visceral leishmaniasis (Kala-azar) is an endemic disease in several regions of India and sub-Saharan Africa. It is caused by the parasite *Leishmania donovani* and spread by *Phlebotomus* sand-flies.

Leishmaniasis is common in immune-suppressed patients, particularly those infected with HIV. There has recently been a substantial increase of cases in the Mediterranean region. It has been estimated that 15% of HIV positive drug users in Spain are infected with *Leishmania donovani* infantum.

Giardiasis and tropical sprue present with gastrointestinal symptoms and malabsorption.

Typhoid is an acute illness.

Coccidioidomycosis is largely confined to the Americas. Most patients present with pulmonary symptoms although disseminated disease can occur particularly in the immune-suppressed.



[Q: 3904] OnExamination 2012 - Infectious disease

Twenty of 30 patients in an adult ward develop colicky abdominal pain and diarrhoea without vomiting between 21:00 and 01:00 hrs.

Meat stew was served for lunch at noon.

Which of the following is the likely diagnosis?

- 1- *Bacillus cereus*
- 2- *Clostridium perfringens*
- 3- Enterotoxigenic *Escherichia coli*
- 4- Enterovirus
- 5- *Staphylococcus aureus*

Answer & Comments

Answer: 2- *Clostridium perfringens*

This food poisoning with no vomiting and an incubation period between 9-13 hours is typical of *Clostridium perfringens*.

The history is too long for a typical *Staph. aureus* infection (vomiting a typical feature, incubation period one to six hours) and rather short for enterovirus (24 hours).

B. cereus can cause two patterns of disease. The classic emetic form is caused by the ingestion of toxin and is characterised by nausea and vomiting, similar to *Staphylococcus aureus*. Rice products are generally the cause of this form.

The diarrhoeal form is caused by the ingestion of the organism, which releases toxin within

the stomach. This can produce an illness similar to *C. perfringens* with watery diarrhoea and abdominal cramps. Meats, milk, vegetables and fish have been associated with this form of the illness. This form is much less common, and the incubation period is classically shorter (1-6 hours) and therefore in this case *C. perfringens* is much more likely to be the diagnosis.

Escherichia coli infection has an incubation period of 12-24 hours and is also associated with marked vomiting.

Supportive treatment is all that is generally required with symptoms resolving after 24 hours.



[Q: 3905] OnExamination 2012 - Infectious disease

A 30-year-old renal transplant recipient presented with non-Hodgkin's lymphoma.

Which virus is most likely to be of aetiological significance?

- 1- Adenovirus
- 2- Cytomegalovirus
- 3- Epstein-Barr virus
- 4- Herpes simplex type 1
- 5- Varicella zoster

Answer & Comments

Answer: 3- Epstein-Barr virus

EBV-associated lymphoproliferative disease may occur in individuals with inherited or acquired immunodeficiency syndromes.

Approximately 1% of renal transplant recipients develop post-transplant lymphoproliferative disease (PTLD) in the first year following their transplant.



[Q: 3906] OnExamination 2012 - Infectious disease

A 27-year-old Somali female presents with a

two month history of weight loss, fever and night sweats.

Chest x ray reveals right upper lobe infiltrates. 3 x sputa are smear -ve.

What is the next most appropriate investigation?

- 1- Bronchoalveolar lavage (BAL)
- 2- CT scan of chest
- 3- HIV test
- 4- Interferon gamma releasing assay (IGRA)
- 5- Tuberculin skin test (TST)

Answer & Comments

Answer: 1- Bronchoalveolar lavage (BAL)

The history, clinical presentation and radiological findings are highly suggestive of pulmonary TB.

BAL is more sensitive than sputum collection at detecting TB, either by smear or culture.

In cases of suspected TB every effort should be made to confirm a suspected diagnosis by culture.

Susceptibility testing is important as detection of resistance alters the combination of drugs and duration of treatment.



[Q: 3907] OnExamination 2012 - Infectious disease

A 45-year-old man returned from a two week trip in Zimbabwe.

Fourteen days later he presented with fever, sore throat, headaches and a widespread maculopapular rash. On examination there was generalised lymphadenopathy and a widespread maculopapular rash.

What is the most likely diagnosis?

- 1- Acute HIV infection
- 2- Schistosomiasis
- 3- Strongyloidiasis

- 4- Tick typhus
- 5- Typhoid fever

Answer & Comments

Answer: 1- Acute HIV infection

It is essential to exclude acute human immunodeficiency virus (HIV) in this case. Acute retroviral syndrome is said to occur in 60-80% of patients between two and 12 weeks following exposure to HIV.

Typical symptoms include fever, pharyngitis, lymphadenopathy and a widespread macular rash. The illness closely resembles infectious mononucleosis.

During seroconversion it is likely that the HIV antibody test will be negative; the diagnosis is made by polymerase chain reaction (PCR) of peripheral blood for HIV ribonucleic acid (RNA); in acute HIV the viral load is very high.

"The time from exposure to onset of symptoms is usually 2-4 weeks, but the incubation may be as long as 10 months in rare cases (N Engl J Med 1998;339:33; N Engl J Med 1997;336:919).

Typical symptoms in a review of 209 cases (J Infect Dis 1994;168:1490) included fever (96%), adenopathy (74%), pharyngitis (70%), rash"

Kahn JO, Walker BD. Acute human immunodeficiency virus type 1 infection. N Engl J Med. 1998; 339(1):33-9. Review



[Q: 3908] OnExamination 2012 - Infectious disease

A 16-year-old boy presented with fever, headache and neck stiffness for 24 hours. He had an identical illness requiring admission to hospital for one year previously.

Cerebrospinal fluid analysis shows white cells of 400/ml with a 90% neutrophilia and Gram stain revealed scanty Gram-negative diplococci.

Which component of the immune system is likely to be defective?

- 1- B lymphocytes

- 2- Complement pathway
- 3- Immunoglobulin
- 4- Neutrophils
- 5- T lymphocytes

Answer & Comments

Answer: 2- Complement pathway

This young man has a recurrent meningococcal meningitis, and deficiencies of complement C5-9 predispose to Neisseria infections (complement deficiencies).

One must recognise that the diplococci seen on microscopy are those of Neisseria meningitidis.



[Q: 3909] OnExamination 2012 - Infectious disease

Which of the following is a cause of isolated B-cell immune deficiency?

- 1- Infection with measles
- 2- Multiple myeloma
- 3- Treatment with azathioprine
- 4- Treatment with corticosteroids
- 5- Treatment with cyclophosphamide

Answer & Comments

Answer: 2- Multiple myeloma

Excessive production of myeloma paraprotein is associated with progressive reduction in normal immunoglobulin levels and impairment of immune function.

Azathioprine, cyclophosphamide, corticosteroids and measles infection all cause reversible impairment of cell mediated immunity.



[Q: 3910] OnExamination 2012 - Infectious disease

A 19-year-old man presented with purulent

urethral discharge.

Microscopy of an urethral swab showed neutrophils but no organisms.

Which of the following antibiotics should be started?

- 1- Ciprofloxacin
- 2- Co-amoxiclav
- 3- Doxycycline
- 4- Metronidazole
- 5- Penicillin

Answer & Comments

Answer: 3- Doxycycline

The diagnosis is non-gonococcal urethritis (NGU). A presumptive diagnosis of gonococcal urethritis is made if Gram negative diplococci are seen within the neutrophils.

Doxycycline is the drug of choice for NGU. Alternative therapies include erythromycin, azithromycin, ofloxacin and ciprofloxacin.

Chlamydia trachomatis is the commonest cause of NGU accounting for 30-50% of cases.

All sexual partners at risk should be assessed and offered epidemiological treatment.

Guidelines:

British Association for Sexual Health and HIV



[Q: 3911] OnExamination 2012 - Infectious disease

A 30-year-old intravenous drug abuser develops acute aortic regurgitation due to infective endocarditis.

Which of the following is not typical of acute aortic regurgitation?

- 1- Decrescendo diastolic murmur
- 2- Hypotension
- 3- Mitral valve pre-closure
- 4- Normal cardiac output
- 5- Peripheral vasodilatation

Answer & Comments

Answer: 5- Peripheral vasodilatation

Findings that would be typical include:

Large pulse volume

Increased pulse pressure

A decrescendo murmur

A low diastolic blood pressure.

Vasoconstriction not dilatation is typically found.



[Q: 3912] OnExamination 2012 - Infectious disease

Which of the following is correct regarding human varicella zoster immunoglobulin (VZIG)?

- 1- Is invariably protective against severe varicella.
- 2- Is recommended for all patients with eczema exposed to chickenpox.
- 3- Is used to treat severe chicken pox infection
- 4- Should be given to a 6 week old baby whose mother has developed chickenpox
- 5- Should be given to an 18 week pregnant non-immune female who has been exposed to a case of chicken pox.

Answer & Comments

Answer: 5- Should be given to an 18 week pregnant non-immune female who has been exposed to a case of chicken pox.

Varicella has a secondary infection rate in household contacts of 90%. It is commonest in spring time, and the incubation period is 14-21 days. It shares the herpes virus family properties of latency and reactivation (zoster).

Risks to the fetus and neonate relate to the time of infection:

Less than 20 weeks pregnancy: congenital varicella (limb hypoplasia, microcephaly,

cataracts, growth retardation, skin scarring).
High mortality.

Second to third trimester: herpes zoster in an otherwise healthy infant.

Minus seven days to plus seven days after delivery: severe and even fatal disease (30% mortality).

Although a live attenuated vaccine is available, it is not licensed for use in the UK.

Varicella zoster immunoglobulin is prepared from pooled plasma of UK blood donors with a history of recent chickenpox or herpes zoster.

Being an immunoglobulin, it is a protein concentrate, and should be stored between 2 and 8°C. Donors are screened for HIV, hepatitis B and hepatitis C.

VZIG prophylaxis is recommended for patients who fulfil all the following criteria:

A clinical condition that increases the risk of severe varicella, (for example, immunosuppression, neonates, pregnant women)

No antibodies to varicella zoster

Significant exposure to chickenpox or herpes.

VZIG prophylaxis is of no benefit if chickenpox has already developed.

Severe or fatal varicella can occur despite VZIG prophylaxis. Active immunisation should therefore be used for susceptible immunosuppressed patients at long term risk.

Clinical chickenpox occurs in 50% of those who receive VZIG prophylaxis, and 10% more will be affected sub-clinically.

Green Book Varicella (PDF)



[Q: 3913] OnExamination 2012 - Infectious disease

Which of the following micro-organisms is generally sensitive to benzylpenicillin?

- 1- Bordetella pertussis
- 2- Cryptococcus neoformans
- 3- Legionella pneumophila
- 4- Mycoplasma pneumoniae
- 5- Streptococcus pneumoniae

Answer & Comments

Answer: 5- Streptococcus pneumoniae

Penicillin binds to specific penicillin-binding proteins (PBPs) in the cell wall, mainly of Gram positive organisms.

Penicillin resistance is usually due to production of altered PBPs, which reduce binding of penicillin, or beta-lactamases which cleave the beta lactam ring.

Penicillin is mainly useful for group A Strep., Group B Strep., meningococcal and pneumococcal infections, though anthrax are also sensitive.

Pneumococci with modified PBPs are an increasing problem.



[Q: 3914] OnExamination 2012 - Infectious disease

A 23-year-old aid worker returns from a spell working alongside locals in a river delta area of Thailand.

During his journey home he developed profuse watery diarrhoea with nausea and vomiting. He opened his bowels some 30 times during the flight. Despite the airline staff trying to give him regular fluids he faints on his arrival in the United Kingdom and is brought to the Emergency department.

On examination his BP is 130/70 mmHg, with a pulse of 90. He has a postural drop of 30 mmHg on standing. There is diffuse abdominal tenderness and very active bowel sounds.

Investigations show:

Hb 14.1 (13.0 - 18.0 g/dL)

WCC 11.2 ($4 - 11 \times 10^9/L$)
 PLT 395 ($150 - 400 \times 10^9/L$)
 Na 144 ($137 - 144 \text{ mmol/L}$)
 K 3.1 ($3.5 - 4.9 \text{ mmol/L}$)
 Cr 199 ($60 - 110 \mu\text{mol/l}$)
 Urea 15.1 ($2.5 - 7.5 \text{ mmol/L}$)

Which of the following is the most important initial therapy?

- 1- Ciprofloxacin
- 2- Doxycycline
- 3- Fluid resuscitation
- 4- Metronidazole
- 5- Penicillin

Answer & Comments

Answer: 3- Fluid resuscitation

This man has evidence of severe dehydration. The suspicion is that he may have cholera, the risk of which is increased according to length of stay in an endemic area, and exposure to poorly cooked / infected seafood.

Fluid resuscitation is the mainstay of therapy for the condition which can lead to severe dehydration as evidenced here by the marked elevation in creatinine and urea.

Antibiotics may play a role in shortening the duration of clinical symptoms and impacting on excretion of *Vibrio* but they are not the mainstay of treatment. Thus, all of the other options are incorrect.

In some cases of severe disease however, tetracyclines or quinolones may be considered.



[Q: 3915] OnExamination 2012 - Infectious disease

A 25-year-old male homosexual is admitted with dyspnoea and weight loss of two months duration.

He is diagnosed with *Pneumocystis pneumoniae* due to AIDS.

*Which of the following concerning *Pneumocystis pneumonia* is true?*

- 1- May have an extra pulmonary presentation
- 2- It is always associated with x ray changes
- 3- It is caused by a bacterium
- 4- Elevated serum antibodies to *P. carinii* are helpful diagnostically
- 5- It is best treated with intravenous pentamidine

Answer & Comments

Answer: 1- May have an extra pulmonary presentation

- A. As would any HIV associated condition.
- B. Five to 15% have normal CXR.
- C. It is caused by a fungus.
- D. There is polyclonal B-cell activation in AIDS.
- E. It is best treated with intravenous cotrimoxazole.



[Q: 3916] OnExamination 2012 - Infectious disease

*Which of the following is true of *Giardia lamblia* infection?*

- 1- Causes steatorrhea
- 2- Diagnosed by stool culture
- 3- Is eradicated by mebendazole
- 4- Is often symptomatic
- 5- Is usually spread by contaminated meats

Answer & Comments

Answer: 1- Causes steatorrhea

It is usually acquired by the faeco-oral route.

Many individuals excreting cysts are asymptomatic and are thus carriers. Others

have diarrhoea, steatorrhoea, abdominal pain and nausea.

It is diagnosed by stool microscopy - if negative, the parasite is found in duodenal aspirates or biopsy. Testing of serum antibodies against *G. lamblia* trophozoites is not useful in diagnosing current infection.

Eradicate with metronidazole (or quinacrine, tinidazole, ornidazole, furazolidone, paromomycin). Mebendazole is used in treating hookworm infections, for example, *Ascaris*, whipworm and threadworm.



[Q: 3917] OnExamination 2012 - Infectious disease

A 23-year-old male presented with a two week history of dysuria and purulent penile discharge. Gram stain of a urethral swab showed Gram negative intracellular diplococci.

Which one of the following is the most likely causative organism?

- 1- Chlamydia trachomatis
- 2- Cytomegalovirus
- 3- Mycoplasma hominis
- 4- Neisseria gonorrhoeae
- 5- Ureaplasma urealyticum

Answer & Comments

Answer: 4- Neisseria gonorrhoeae

Neisseria gonorrhoeae occurs in young adults and is often preceded by a migratory tendonitis or arthritis. Gram stain is positive in 25% and culture positive in 50%.

Neisseria gonorrhoeae is a species of Gram negative bacteria responsible for the disease gonorrhoea. They are highly fastidious Gram negative cocci, that is, they require special nutrients to survive. These cocci typically appear in pairs (diplococci).



[Q: 3918] OnExamination 2012 - Infectious disease

A 23-year-old woman presents 16 weeks into her pregnancy with a vaginal discharge.

Further investigation confirms infection with *Chlamydia trachomatis*.

Which of the following is the most appropriate treatment for this patient?

- 1- Ciprofloxacin
- 2- Co-trimoxazole
- 3- Doxycycline
- 4- Erythromycin
- 5- Metronidazole

Answer & Comments

Answer: 4- Erythromycin

C. trachomatis infection is common in pregnancy and is associated with adverse fetal outcome including:

Spontaneous miscarriage

Premature rupture of membranes and

Intrauterine growth retardation (IUGR).

Appropriate treatment is with macrolides such as erythromycin or azithromycin,

Erythromycin has an established safety profile in pregnancy whereas at present the BNF states that azithromycin should be used with caution.

Azithromycin is becoming more widely used as WHO guidelines now recommend its use as it has advantages over erythromycin such as a lower side effect profile and a single one-off dose treatment which results in increased compliance.

Local guidelines should be consulted. Of the options provided here, erythromycin is the most appropriate.

Both doxycycline and ciprofloxacin are contraindicated in pregnancy.



[Q: 3919] OnExamination 2012 - Infectious disease

An 18-year-old male presented with a two week history of dysuria and purulent penile discharge.

Gram stain of a urethral swab showed Gram negative intracellular diplococci.

What specific treatment should he receive?

- 1- Cefixime
- 2- Cephadrine
- 3- Ciprofloxacin
- 4- Co-amoxiclav
- 5- Crystalline penicillin

Answer & Comments

Answer: 1- Cefixime

Neisseria gonorrhoeae occurs in young adults and is often preceded by a migratory tendonitis or arthritis.

Gram stain is positive in 25% and culture positive in 50%.

Current UK guidelines recommend first line treatment with either cefotaxime, cefixime or spectinomycin may be given (as a stat dose).

Fluoroquinolones are no longer used as first line treatment due to the high rate of resistance.



[Q: 3920] OnExamination 2012 - Infectious disease

One of the nurses working on the care of the elderly ward sustains a needlestick injury while taking blood from a patient.

What is the most appropriate immediate management?

- 1- Administer prophylactic hepatitis B immunoglobulin (HBIG) regardless of vaccine status
- 2- Exclude the nurse from performing exposure-prone procedures for three

months until a negative HIV antibody test has been obtained

- 3- Immediately take the nurse's blood to test for antibodies to hepatitis B, hepatitis C and human immunodeficiency viruses
- 4- Prompt administration of antiretroviral therapy
- 5- Wash the wound with soap under running water

Answer & Comments

Answer: 5- Wash the wound with soap under running water

The first line of management of needlestick injuries includes immediate washing under running water.

All incidents should be reported to the occupational health department and have a careful risk assessment.

HBIG is given only if the donor is known to be hepatitis B positive and the victim is non-immune.

Antiretroviral therapy is given, after counselling, if the donor is known HIV positive and the exposure is deemed high risk.



[Q: 3921] OnExamination 2012 - Infectious disease

A 19-year-old male student attends the Emergency department complaining of an urethral discharge one week after having casual unprotected sex.

Gram stain shows numerous neutrophils, some of which contain Gram negative intracellular diplococci. The patient is treated with ceftriaxone 250 mg as an intramuscular injection. Five days later, the patient re-attends with persisting discharge.

Which of the following is the most likely cause of this discharge?

- 1- Chlamydia trachomatis

- 2- Penicillin-resistant *Neisseria gonorrhoeae*
- 3- Re-infection with *Neisseria gonorrhoeae*
- 4- *Ureaplasma urealyticum*
- 5- Urethral stricture

Answer & Comments

Answer: 1- *Chlamydia trachomatis*

This patient has been adequately treated for gonorrhoea and a persistent discharge would be unusual unless, as is often the case, there is a co-infection.

The patient is likely to have a non-specific urethritis due to *Chlamydia trachomatis*, requiring treatment with either doxycycline or erythromycin for seven to 14 days.



[Q: 3922] OnExamination 2012 - Infectious disease

In the diagnosis of rheumatic fever, which of the following may be helpful?

- 1- A generalised macular-papular rash
- 2- ASO titre of less than 1:200
- 3- Polyarthrititis
- 4- Splinter haemorrhages
- 5- *Staphylococcus aureus* grown on throat culture

Answer & Comments

Answer: 3- Polyarthrititis

Of the following Jones criteria, two major, or one major and two minor, and evidence of recent streptococcal infection, is required for the diagnosis of rheumatic fever (RF).

Major:

Pancarditis

Polyarthrititis

Erythema marginatum

Chorea

Subcutaneous nodules

The rash is macular.

Minor:

Fever

Polyarthralgia

History of RF

Raised erythrocyte sedimentation rate/c-reactive protein (ESR/CRP)

Prolonged PR interval on electrocardiogram (ECG).



[Q: 3923] OnExamination 2012 - Infectious disease

A 52-year-old woman was admitted with malaise and leg weakness.

Her illness started with a sore throat while travelling in eastern Europe.

On examination she was febrile (39.1°C) with several areas of exudates on her pharynx and extensive cervical lymphadenopathy. There was weakness of the legs with absent tendon reflexes.

What is the most likely diagnosis?

- 1- Acute myeloid leukaemia
- 2- Cytomegalovirus infection
- 3- Diphtheria
- 4- Glandular fever
- 5- Streptococcal tonsillitis

Answer & Comments

Answer: 3- Diphtheria

This history of severe exudative pharyngitis in a person who has recently travelled to eastern Europe is highly suggestive of diphtheria.

The disease, caused by *Corynebacterium diphtheriae*, causes a severe pharyngitis with extensive soft tissue swelling and

lymphadenitis that produces a characteristic 'bull neck' appearance.

Exotoxins produced by the organism may cause myocarditis or neurological defects. The degree of neurological toxicity varies, but may be severe, causing cranial neuropathies, predominantly motor peripheral neuropathy (occasionally sensory neuropathy).

An epidemic of diphtheria began in Russia in the early 1990s and remains a significant public health problem in Russia and in the former Soviet states.



[Q: 3924] OnExamination 2012 - Infectious disease

A 18-year-old homosexual male developed progressive pneumonia not responding to antibiotics.

Methenamine silver staining of the sputum showed small circular cyst and Giemsa staining demonstrated the small, punctate nuclei of the trophozoites and intracystic sporozoite.

Which is the most likely organism?

- 1- Cryptococcus neoformans
- 2- Leishmania donovani
- 3- Pneumocystis carinii
- 4- Toxoplasma gondii
- 5- Trypanosoma cruzi

Answer & Comments

Answer: 3- Pneumocystis carinii

The organism is Pneumocystis carinii.

The organism may be identified on microscopy after

Methenamine silver staining for the cyst phase of the organism

Giemsa staining that demonstrates the small, punctate nuclei of the trophozoites and intracystic sporozoites; or

Fluorescence-tagged monoclonal antibody.



[Q: 3925] OnExamination 2012 - Infectious disease

A 25-year-old female recently returned from Nigeria, presents to the Emergency department with a two day history of fever and rigors.

Subsequently she develops a seizure.

What is the next most appropriate immediate investigation?

- 1- Blood culture
- 2- Blood film for malarial parasites
- 3- CT scan of head
- 4- Lumbar puncture
- 5- MR scan of head

Answer & Comments

Answer: 2- Blood film for malarial parasites

With a recent history of travel to Nigeria, cerebral malaria caused by *P. falciparum* should be considered as a likely cause of her symptoms.

Therefore, a malaria blood film should be performed.

Other investigations may be required but investigations for malaria should be performed immediately.



[Q: 3926] OnExamination 2012 - Infectious disease

Which of the following is true regarding varicella zoster infection?

- 1- Associated pneumonitis is equally common in smokers and non-smokers
- 2- Causes congenital limb deformity
- 3- Causes urinary incontinence
- 4- Gamma interferon is an effective treatment.

- 5- Produces latent infection within the anterior horn cells

Answer & Comments

Answer: 2- Causes congenital limb deformity

Varicella zoster infection causes herpes zoster and chicken pox.

Herpes zoster is due to reactivation of the virus lying dormant in the cells of dorsal root ganglion.

Autonomic involvement can cause urinary retention.

Pregnancy increases risk of pneumonitis.

Chicken pox in the first and second trimester can produce a syndrome of skin scarring, hypoplastic limbs, eye and central nervous system impairments.

Pneumonitis is uncommon in children with incidence of 0.3% in immunocompetent adults. The risk is higher in smokers.

Antiviral treatment includes aciclovir and vidabarine.



[Q: 3927] OnExamination 2012 - Infectious disease

Two strains of Escherichia coli are isolated and both are resistant to ampicillin.

Strain A retains its resistance to ampicillin when grown from multiple generations in the absence of ampicillin.

However strain B loses its resistance when grown in the absence of ampicillin.

Which of the following best explains the loss of antibiotic resistance in strain B?

- 1- Changes in the bacterial DNA gyrase
- 2- Downregulation of the resistance gene
- 3- Loss of a plasmid containing the resistance gene
- 4- Mutations in the resistance gene

- 5- Transposition of another sequence into the resistance gene

Answer & Comments

Answer: 3- Loss of a plasmid containing the resistance gene

Bacteria develop resistance to antibiotics by gaining genes that encode particular proteins that offer protection to the organism.

Sometimes this is by mutation and other times the gene may be acquired from another bacterial species.

The genes are usually found in plasmids - circular segments of DNA separate from the bacterial chromosome.

Plasmids can easily spread from one bacteria to another - a sort of resistance package that bacteria can share.



[Q: 3928] OnExamination 2012 - Infectious disease

A 29-year-old man from Southampton with human immunodeficiency virus (HIV) infection (CD4 cell count 150 cells/mm³) is admitted to hospital with a 10 day history of fever (temperature 38.8°C), a dry cough, weight loss and night sweats.

There is a history of previous tuberculosis. His current medications include TDF/3TC/EFV and inhaled pentamidine.

Physical examination reveals crackles in the upper lung fields. Chest radiography reveals bilateral upper lobe infiltrates.

Initial results of his induced sputum examination demonstrate no organisms seen on Gram, fungal, acid-fast and Pneumocystis jiroveci pneumonia staining.

Which regimen would be most effective against the likely cause of this man's symptoms?

- 1- Clarithromycin and Amoxil

- 2- Ganciclovir
- 3- Isoniazid, rifampin, ethambutol and pyrazinamide
- 4- Itraconazole
- 5- Trimethoprim-sulfamethoxazole

Answer & Comments

Answer: 5- Trimethoprim-sulfamethoxazole

The clinical presentation of the said patient is compatible with *Pneumocystis jiroveci* pneumonia (PCP).

Inhaled pentamidine is not as effective as trimethoprim-sulfamethoxazole in preventing PCP.

Focal lobe infiltrates are more common in patients who have been receiving aerosol pentamidine prophylaxis. The sensitivity of induced sputum for PCP might be decreased in patients receiving pentamidine prophylaxis.

This patient requires bronchoscopy with bronchoalveolar lavage for diagnosis; trimethoprim-sulfamethoxazole is the treatment of choice unless the patient is allergic.

Isoniazid, rifampin, ethambutol and pyrazinamide are used in the treatment of tuberculosis.

Itraconazole is the wrong answer.

Pneumocystis jiroveci pneumonia is officially classified as fungal pneumonia, but lacks ergosterol and is not susceptible to antifungal drugs that inhibit ergosterol synthesis.

Ganciclovir is the treatment of choice for cytomegalovirus (CMV) infections. CMV is a differential diagnosis for PCP. It also presents with fevers, dyspnoea, and cough as the symptoms.

Clarithromycin and Amoxil are the empiric treatment for community acquired pneumonias caused by bacteria.



[Q: 3929] OnExamination 2012 - Infectious disease

You are asked to be part of a team reviewing the passengers on a cruise ship. Over the course of the past four days there has been a massive increase in cases of diarrhoea and vomiting and the ship has returned to port.

Currently over 300 passengers are estimated to be unwell. Apparently a number of passengers ate at the speciality seafood restaurant or are sharing cabins with passengers who did. Out of 10 passengers admitted to the local hospital so far, all of them showed signs of dehydration, but no signs of raised white cell count.

Which of the following is the most likely infective agent?

- 1- *Campylobacter*
- 2- Norovirus
- 3- Rotavirus
- 4- *Salmonella*
- 5-

Answer & Comments

Answer: 2- Norovirus

Three factors stand out:

The rapid spread of the diarrhoea and vomiting

The fact that most of the passengers had eaten in the ship's seafood restaurant

Patients admitted to the hospital so far show no signs of neutrophilia, but do show signs of dehydration.

Norovirus is concentrated in shellfish, small oysters and plankton, and person to person spread can occur from aerosols of projectile vomit or faecal material.

Rotavirus, in contrast, occurs more frequently in and is more severe in the paediatric population.



[Q: 3930] OnExamination 2012 - Infectious disease

A 35-year-old HIV positive African woman presented with weakness of both legs and double incontinence.

CSF showed increased protein and neutrophils with normal glucose.

What is the most likely cause of her weakness?

- 1- CMV polyradiculomyelopathy
- 2- Guillain-Barré syndrome
- 3- Herpes virus encephalitis
- 4- HIV encephalopathy
- 5- Toxoplasma encephalitis

Answer & Comments

Answer: 1- CMV polyradiculomyelopathy

Symptoms are suggestive of polyradiculomyelopathy (weakness of legs with involvement of sphincters).

Increased neutrophils are found in CMV polyradiculomyelopathy but not in Guillain-Barré syndrome.

HIV encephalopathy usually causes confusion and memory loss. It does not involve sphincters.

Guillain-Barré syndrome causes polyradiculopathy, explaining all her symptoms, but with normal cell counts and raised protein in the CSF.

Herpes simplex encephalitis causes fever, headache, confusion and deteriorating level of consciousness.



[Q: 3931] OnExamination 2012 - Infectious disease

Deficiency of which of the following components of the complement system predisposes to infection with Neisseria meningitidis?

- 1- C1q

2- C1r

3- C1s

4- C3

5- C4

Answer & Comments

Answer: 4- C3

The complement system often gives rise to questions in the MRCP examination. It would be wise to make a cursory review of this topic.

C3 is the point at which the classical, alternative and lectin complement pathways converge.

C1qrs, C2 and C4 are strongly associated with systemic lupus erythematosus (SLE).

Patients with C3 deficiency, be it absolute, relative, genetically determined (autosomal dominant or recessive) or due to properdin deficiency, are predisposed to recurrent infection with encapsulated proteins, particularly *N. meningitidis*.

C5 deficiency is associated with Leiner's disease, a syndrome of recurrent diarrhoea, wasting and generalised seborrhoeic dermatitis presenting in infants.



[Q: 3932] OnExamination 2012 - Infectious disease

A 30-year-old schoolteacher is admitted with headache, photophobia and neck stiffness.

His temperature is 39.0°C, pulse rate 120 beats/min and he has no skin rash or focal neurological signs. His Glasgow coma scale is 15/15.

A CT scan shows no contraindication to lumbar puncture. CSF is obtained and Gram stain shows Gram positive cocci, subsequent culture confirms a pneumococcal meningitis.

What chemoprophylaxis should be offered to his pupils?

- 1- Azithromycin

- 2- Ceftriaxone
- 3- Ciprofloxacin
- 4- No chemoprophylaxis required
- 5- Rifampicin

Answer & Comments

Answer: 4- No chemoprophylaxis required

Chemoprophylaxis is not normally indicated for close contacts of those with pneumococcal meningitis.

Chemoprophylaxis with rifampicin, ceftriaxone, ciprofloxacin or azithromycin is used for meningococcal meningitis.

Close contacts of *Haemophilus influenzae* meningitis should receive rifampicin; children under 2 years should be vaccinated.



[Q: 3933] OnExamination 2012 - Infectious disease

A 35-year-old man is seen six months after a cadaveric renal allograft. He receives azathioprine and prednisolone. He has felt generally unwell for the past week with a pyrexia of 38.6°C, anorexia and a cough productive of thick green sputum.

Chest x ray reveals a left lower lobe nodule of approximately 5 cm diameter with central cavitation. Analysis of the sputum reveals long, crooked, branching and beaded Gram positive filaments.

Which of the following antimicrobials is the most appropriate initial therapy for this patient?

- 1- Ceftazidime
- 2- Co-amoxiclav
- 3- Co-trimoxazole
- 4- Erythromycin
- 5- Rifampicin and isoniazid

Answer & Comments

Answer: 3- Co-trimoxazole

The likely diagnosis is nocardiosis.

Nocardia are aerobic, Gram positive branching filamentous bacteria which often appear beaded on staining. Nocardiosis can be diagnosed rapidly by examination of sputum or pus with the Gram stain and a modified acid-fast stain.

Pneumonia is typically found in the immunocompromised, as in this case and may be a single lesion or extensive pneumonic consolidation.

The drug of choice is trimethoprim-sulfamethoxazole.



[Q: 3934] OnExamination 2012 - Infectious disease

Regarding diphtheria which of the following statements is correct?

- 1- About 50 cases per year are seen in the UK.
- 2- It is characterised by an inflammatory exudate forming a greyish membrane on the buccal mucosa.
- 3- It is predominantly spread from cutaneous lesions.
- 4- It produces a toxin which affects the myocardium, nervous and adrenal tissues.
- 5- 3 doses of toxoid provides 75% protection.

Answer & Comments

Answer: 4- It produces a toxin which affects the myocardium, nervous and adrenal tissues.

Diphtheria is spread by droplets, through contact with soiled articles (fomites), and, in areas of poor hygiene, from cutaneous spread.

The inflammatory exudate forms a greyish membrane on the tonsils and respiratory tract which may cause respiratory obstruction.

Incubation is between two and five days, and patients may be infectious for four weeks.

The toxin affects the myocardium, nervous and adrenal tissues.

The immunisation has been tremendously successful, and most cases seen in the United Kingdom are imported from the Indian subcontinent or Africa.

Recently, there has been a worrying epidemic of diphtheria in Russia and the newly independent states of the former Soviet Union. In 1995, 52,000 cases and 1,700 deaths were reported.



[Q: 3935] OnExamination 2012 - Infectious disease

Which of the following is true of Koplik's spots?

- 1- Are diagnostic of measles
- 2- Located opposite the incisor teeth.
- 3- Only appear when fever is over 39°C
- 4- They appear as red papules on the palmar surface of the hands
- 5- Typically appear two days after the rash.

Answer & Comments

Answer: 1- Are diagnostic of measles

Koplik's spots are small, irregular, bright red spots with blue-white centres, occurring on the inside of the cheek next to the premolars.

Seen only in measles, they are diagnostic.

The spots usually occur briefly after the fever begins and a couple of days before the generalised rash appears.

Not infrequently, the spots disappear as the eruption develops.



[Q: 3936] OnExamination 2012 - Infectious disease

A 47-year-old Portuguese former intravenous drug abuser presented with a two week history of right hemiparesis.

He was found to have hepatitis B and C infection. His absolute lymphocyte count was 0.6×10^9 . CT of the head showed multiple ring-enhanced lesions.

What would be your next best course of action?

- 1- Manage him conservatively with physiotherapy
- 2- Refer him to a neurosurgeon for urgent brain biopsy
- 3- Refer him to a stroke specialist
- 4- Request an HIV antibody test
- 5- Start thrombolysis treatment

Answer & Comments

Answer: 4- Request an HIV antibody test

This man was already infected with two blood-borne viruses (hepatitis B and C). His absolute lymphocyte count was low. CT scan showed multiple ring-enhanced lesions, which were suggestive of cerebral toxoplasmosis.

Therefore, testing HIV is the next best course of action. Finding multiple ring-enhanced lesions on CT scan needs further investigations.

Managing conservatively with physiotherapy is not an appropriate course of action.

CT scan is not typical of brain tumour, hence referring him for urgent brain biopsy is not the best course of action.

Thrombolysis treatment should not be started, as the CT scan was not typical of ischaemic stroke.

Reference:

Yoganathan K. A brain tumour in an intravenous drug abuser. Accepted for publication in

International Journal of General Medicine in February 2009.



[Q: 3937] OnExamination 2012 - Infectious disease

Four members of a football team develop diarrhoea due to Salmonella enteritidis.

Eating which food was the most likely source of the infection?

- 1- Chicken at a fast food outlet 20 hours earlier
- 2- Fried rice at a takeaway 4 hours earlier
- 3- Raw eggs in milk 6 hours earlier
- 4- Raw oysters at a hotel 24 hours earlier
- 5- Soft cheeses 48 hours earlier

Answer & Comments

Answer: 1- Chicken at a fast food outlet 20 hours earlier

The incubation time for Salmonella enteritidis is 12-48 hours and the likely sources are poultry and eggs.

Raw oysters are associated with infections such as the Norwalk agent.



[Q: 3938] OnExamination 2012 - Infectious disease

Reverse transcriptase-PCR is used to amplify which of the following?

- 1- Antibodies
- 2- DNA
- 3- Plasmids
- 4- Protein
- 5- RNA

Answer & Comments

Answer: 5- RNA

Reverse transcriptase PCR is a means of amplifying ribonucleic acid (RNA).

The RNA is transcribed into complementary deoxyribonucleic acid (cDNA).

Using the enzyme reverse transcriptase, the cDNA is then amplified by conventional polymerase chain reaction (PCR).



[Q: 3939] OnExamination 2012 - Infectious disease

A 28-year-old woman comes to the clinic complaining of a thin fishy smelling discharge. She does not however have any vaginal irritation, redness or itching.

Despite using body wash and showering twice per day, she says the smell and discharge persists. She is in a stable relationship with her husband and has two young children.

Which of the following is the most likely diagnosis?

- 1- Bacterial vaginosis
- 2- C. trachomatis
- 3- Herpes simplex infection
- 4- N. gonorrhoeae
- 5- T. vaginalis

Answer & Comments

Answer: 1- Bacterial vaginosis

The answer is A, bacterial vaginosis.

This woman is in a stable relationship, with a history of excess body washing, the history of clear discharge without irritation fits best with bacterial vaginosis. It typically features a reduction in the number of the normal hydrogen peroxide-producing Lactobacilli in the vagina.

Simple measures such as reducing the use of body wash and considering using a lactic acid preparation to restore her natural vaginal flora will often reduce symptoms.

A course of oral metronidazole for five - seven days will further reduce discharge and odour.

In pregnancy, bacterial vaginosis may increase the risk of miscarriage.



[Q: 3940] OnExamination 2012 - Infectious disease

A 42-year-old single man comes to the clinic some two weeks after a tour to Thailand.

During his trip he admits to unprotected sex with a number of prostitutes. Since his return he has been suffering fevers and night sweats over the past few days and has noticed some swollen lymph nodes in his neck, arm pits and groin. He has also felt nauseous and been off his food.

On examination you confirm that he has a low-grade fever of 37.60C, and lymphadenopathy. He also has pharyngitis.

Investigations:

Haemoglobin 12.9 g/dl(13.5-17.7)

White cell count $9.8 \times 10^9/l$ (4-11)

Platelets $272 \times 10^9/l$ (150-400)

Serum Sodium 138 mmol/l (135-146)

Serum Potassium 4.0 mmol/l (3.5-5)

Creatinine 80 micromol/l (79-118)

Alanine aminotransferase 129 U/l (5-40)

You are wondering about acute HIV infection.

Which of the following would be an appropriate test to detect this?

- 1- Anti-HIV antibody by ELISA
- 2- Anti-HIV antibody by western blot
- 3- CD4 count
- 4- CD8 count
- 5- P24 antigen

Answer & Comments

Answer: 5- P24 antigen

The answer is E, P24 antigen.

The concern here is that testing would be too soon to detect antibodies to HIV in the serum.

As such P24 antigen testing may detect HIV infection one to three weeks after the event and is the most appropriate option here.

The alternative is HIV RNA testing to estimate viral load.

HIV antibody testing by western blot has a lower false positive rate than HIV antibody by ELISA and may be an option when a false positive result is suspected.

CD4 counts begin to reduce later in HIV infection.



[Q: 3941] OnExamination 2012 - Infectious disease

A 22-year-old student presents to the clinic complaining of a large crop of intensely painful blisters/ulcers and tingling pain affecting her vulva. She gives a history of unprotected sex on two occasions in the past two weeks, with a new partner who she met at a party.

She feels under the weather, is experiencing dysuria and has noticed vaginal discharge.

On examination you notice a number of small blisters/ ulcers over her vulva and tender inguinal lymph nodes.

Which of the following is the most likely diagnosis?

- 1- Bechet's syndrome
- 2- Chancroid
- 3- Genital herpes simplex
- 4- Genital herpes zoster
- 5- Syphilis

Answer & Comments

Answer: 3- Genital herpes simplex

The answer is C, genital herpes simplex.

The history of a mild constitutional illness coupled with painful and blistering genital ulceration and neuropathic type pain fits best

with herpes simplex infection. Viral swabs for PCR are used for confirming the diagnosis, and the patient should be started on an appropriate oral anti-viral such as aciclovir.

It is also mandatory that they undergo a full sexual health screen at the local genitourinary medicine clinic to exclude co-infection with another sexually transmitted disease.

Topical anti-virals have no value in the management of the condition. The ulcers of syphilis, a differential here, are usually painless.



[Q: 3942] OnExamination 2012 - Infectious disease

A 16-year-old boy is to be admitted to the hospital for elective splenectomy.

Which of the following booking times before surgery should he be given to receive his pneumococcal vaccination?

- 1- Three days
- 2- One week
- 3- Four weeks
- 4- Two months
- 5- Three months

Answer & Comments

Answer: 3- Four weeks

Patients should be vaccinated with an appropriate pneumococcal vaccination at least two weeks prior to surgery to allow the maximal humoral immune response. If they have not received the Haemophilus influenzae or meningococcal vaccinations, then they should also receive these.

In cases of emergency splenectomy related to trauma, patients should be vaccinated as early as possible after surgery. Patients who have undergone splenectomy are at significantly increased risk of infection from all three of these bacteria without vaccination.

They should also be enrolled in the yearly seasonal flu vaccination programme post splenectomy.

Reference:

Update of guidelines for the prevention and treatment of infection in patients with an absent or dysfunctional spleen (pdf) British Committee for Standards in Haematology



[Q: 3943] OnExamination 2012 - Infectious disease

A 72-year-old woman presents to her GP a few days after discharge from hospital after a community acquired pneumonia with some cellulitis around an old IV site on her left hand.

On examination she is pyrexial at 37.6°C, and has a 5 cm x 3 cm area of erythema and some discharging pus from the entry site of the needle.

Investigations show

Haemoglobin 11.6 g/dl (11.5-16.5)

White cell count $11.2 \times 10^9/L$ (4-11)

Platelets $193 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 4.3 mmol/l (3.5-5)

Creatinine 110 $\mu\text{mol/l}$ (79-118)

Swab from cellulitis site MRSA

Which of the following is the most appropriate empirical antibiotic for her whilst awaiting sensitivities?

- 1- Co-trimoxazole
- 2- Doxycycline
- 3- Flucloxacillin
- 4- Trimethoprim
- 5- Vancomycin

Answer & Comments

Answer: 2- Doxycycline

This woman has an area of methicillin-resistant Staphylococcus aureus (MRSA)

cellulitis on her hand which is likely to respond to oral antibiotic therapy; her white count and temperature are only mildly elevated.

Tetracyclines and clindamycin are known to have activity against MRSA and can be delivered orally; as such, either option would be a reasonable empirical choice in this case.

For more severe infections, either IV vancomycin or linezolid may be an appropriate option.



[Q: 3944] OnExamination 2012 - Infectious disease

A 34-year-old Thai lady presented with a left hemiparesis of two weeks duration.

HIV antibody test was positive. CT scan of the head showed multiple ring-enhanced lesions.

What is the most likely cause of her weakness?

- 1- Amoebic brain abscesses
- 2- Cerebral toxoplasmosis
- 3- Herpes simplex encephalitis
- 4- Primary brain lymphoma
- 5- Progressive multifocal leucoencephalopathy

Answer & Comments

Answer: 2- Cerebral toxoplasmosis

Cerebral toxoplasmosis is the most likely diagnosis. Multiple ring-enhanced lesions are commonly seen in patients with cerebral toxoplasmosis, though solitary ring enhanced lesions are seen in 25% of patients on CT scan. MRI scan is more sensitive in identifying small lesions than CT scan.

Amoebic brain abscesses are not the most likely cause in this patient.

Multiple ring-enhanced lesions are not seen in patients with herpes simplex encephalitis.

Primary brain lymphoma causes a significant mass effect with surrounding oedema.

Progressive multifocal leucoencephalopathy causes multifocal white matter lesions without any mass effect or surrounding oedema.

Reference:

Yoganathan K., A brain tumour in an intravenous drug abuser. Accepted for publication in International Journal of General Medicine, February 2009.



[Q: 3945] OnExamination 2012 - Infectious disease

Which of the following is correct concerning oseltamivir?

- 1- It is a direct viral cytotoxic agent
- 2- It is a haemagglutinin inhibitor
- 3- It is administered via an inhaler
- 4- It is effective if administered within 72 hours of symptoms of flu
- 5- It is of value in prophylaxis against influenza

Answer & Comments

Answer: 5- It is of value in prophylaxis against influenza

Oseltamivir (Tamiflu), like its predecessor zanamivir (Relenza) functions as an antiviral through inhibition of the enzyme neuraminidase, thus slowing viral replication down rather than directly killing the virus particle.

This slowing down of replication is important in permitting time for the body's own immune system to deal with the virus.

Unlike inhaled zanamivir, oseltamivir is administered orally.

However, viral replication is rapid and to be effective the drug must be given as early as possible after the development of symptoms of flu and preferably within 48 hours.



[Q: 3946] OnExamination 2012 - Infectious disease

Which one of the following measures would be most effective in reducing transmission of E coli O157:H7 during an outbreak of diarrhoea caused by this organism?

- 1- Drinking only boiled water
- 2- Ensuring that meat products are thoroughly cooked
- 3- Giving antibiotics to individuals who are positive for E. coli on stool culture
- 4- Hand washing before preparing food
- 5- Isolation of individuals with diarrhoea

Answer & Comments

Answer: 2- Ensuring that meat products are thoroughly cooked

Cattle are a major reservoir of Escherichia coli O157:H7 and contaminated meat is the most commonly implicated source of outbreaks.

Raw meat should be separated from cooked and ready-to-eat food. Hands should be washed after handling raw meat.

Antibiotics are not routinely indicated and patients should be educated on personal hygiene.



[Q: 3947] OnExamination 2012 - Infectious disease

An 35-year-old man presented with high fever, headache and mild jaundice on returning from a holiday in Spain. The group of 20 had travelled together visiting forestry on the hills with fishing trips in mountain streams.

Which of the following organisms is most likely to be responsible for his illness?

- 1- Borrelia burgdorferi
- 2- Legionella pneumophila
- 3- Leptospira icterohaemorrhagiae
- 4- Mycoplasma pneumoniae

5- Pneumococcus

Answer & Comments

Answer: 3- Leptospira icterohaemorrhagiae

Leptospirosis, or Weil's disease, is transmitted to man by animals, including rodents (rat urine and faeces), skunks, foxes, cattle, dogs.

The disease is characterised by

- Jaundice
- Fever
- Oliguria
- Headache
- Myalgia
- Haemorrhagic tendencies with purpura or petechiae
- Enlargement of liver and spleen.



[Q: 3948] OnExamination 2012 - Infectious disease

One of the surgical wards in your hospital notes an outbreak of methicillin-resistant Staphylococcus aureus (MRSA) infections.

What is the best mechanism for reducing further transmission of this infection?

- 1- Cleaning the floors and walls of the ward with chlorhexidine
- 2- Close the ward for one month
- 3- Encourage regular hand washing by ward staff
- 4- Screen ward staff using nasal swabs and exclude those with positive cultures for MRSA
- 5- Treatment of culture-positive patients with vancomycin

Answer & Comments

Answer: 3- Encourage regular hand washing by ward staff

Cross-infection via hands of medical and nursing staff is a very important vehicle of transmission of MRSA.

Hand washing before and after contact with patients is the single most effective measure to control hospital spread of this organism.

Screening of ward staff is appropriate only in certain situations and should not be carried out unless recommended by the hospital infection control team.

Vancomycin should never be used for MRSA decolonisation.

The hospital infection control policy should outline which patients should be screened and when decolonisation should be attempted.



[Q: 3949] OnExamination 2012 - Infectious disease

Which of the following is a contraindication to immunisation?

- 1- A child with cerebral palsy.
- 2- A child with congenital adrenal hyperplasia on oral cortisone.
- 3- A history of prolonged jaundice.
- 4- Infantile eczema requiring topical steroids.
- 5- Oral poliomyelitis vaccine to a child on oral steroids.

Answer & Comments

Answer: 5- Oral poliomyelitis vaccine to a child on oral steroids.

Common misconceptions regarding immunisations include that vaccinations cannot be given to the following patient groups:

A family history of adverse reaction, or a previous history of pertussis, measles, rubella or mumps infection

Prematurity or low birth weight

Stable neurological conditions such as cerebral palsy or Down's syndrome

Asthma, eczema, hayfever or snuffles

Contact with an infectious disease, or treatment with antibiotics or topical steroids

Pregnant mother or a mother who is breast feeding

Prolonged jaundice

Patients on replacement corticosteroids.

In general, it is safe to give all these patients vaccinations but in most cases it is discussed with a specialist (or there are specific guidelines). However, the oral polio vaccine (which is live) should not be given to immunosuppressed children, their siblings or household contacts. Live vaccines are also usually not given to pregnant women.

In children with HIV, there is little evidence that they themselves will have problems, but excretion may be prolonged, and this may give rise to an increased risk of infection of HIV positive household contacts.



[Q: 3950] OnExamination 2012 - Infectious disease

A 51-year-old homosexual Caucasian HIV positive man developed multiple violaceous painless lesions on his trunk.

Which one of the following is the most likely cause of his skin lesions?

- 1- Cytomegalovirus (CMV)
- 2- Human herpes virus 8 (HHV8)
- 3- Human herpes virus 10 (HHV 10)
- 4- Human papilloma virus 16 (HPV 16)
- 5- Pox virus

Answer & Comments

Answer: 2- Human herpes virus 8 (HHV8)

Multiple violaceous painless lesions are typical of Kaposi's sarcoma in Caucasians. This is associated with HHV 8.

CMV and HHV 10 do not cause multiple violaceous painless lesions.

HPV 16 is an oncogenic virus which causes squamous cell carcinomas.

Pox virus causes molluscum contagiosum.



[Q: 3951] OnExamination 2012 - Infectious disease

A 27-year-old pop singer presented with a two month history of loose motions and weight loss. He underwent an HIV antibody test and was found to be positive.

The presence of which of the following diseases most likely indicates a diagnosis of AIDS?

- 1- Brucellosis
- 2- Glandular fever
- 3- Lyme disease
- 4- Oral candidiasis
- 5- Pulmonary tuberculosis

Answer & Comments

Answer: 5- Pulmonary tuberculosis

AIDS defining diseases are:

Cytomegalovirus disease (other than liver, spleen, or nodes)

Cytomegalovirus retinitis (with loss of vision)

Encephalopathy, HIV-related

Herpes simplex: chronic ulcer(s) (>1 month's duration); or bronchitis, pneumonia, or oesophagitis

Histoplasmosis, disseminated or extrapulmonary

Isosporiasis, chronic intestinal (>1 month's duration)

Kaposi's sarcoma

Lymphoma, Burkitt's (or equivalent term)

Lymphoma, primary, of brain

Mycobacterium avium complex or M. kansasii, disseminated or extrapulmonary

Mycobacterium tuberculosis, any site (pulmonary or extrapulmonary)

Mycobacterium, other species or unidentified species, disseminated or extrapulmonary

Pneumocystis carinii pneumonia

Pneumonia, recurrent

Progressive multifocal leukoencephalopathy

Salmonella septicaemia, recurrent

Toxoplasmosis of brain

Wasting syndrome due to HIV.



[Q: 3952] OnExamination 2012 - Infectious disease

An 82-year-old female is reviewed after the staff of the nursing home in which she resides expressed concern regarding a vaginal discharge.

She has been in the nursing home for the last year and has profound Alzheimer's dementia.

Culture of the discharge reveals Neisseria gonorrhoeae.

Which is the most appropriate course of action for this patient?

- 1- Contact the police
- 2- Contact tracing of sexual partners
- 3- Informal enquiry to the nursing home
- 4- Seek advice from the Medical Defence Union (MDU)
- 5- Treat the patient and discharge back to the nursing home

Answer & Comments

Answer: 4- Seek advice from the Medical Defence Union (MDU)

These ethical questions can be quite tough to answer with accuracy.

This question specifically relates to elder abuse, in this case potential elder sexual abuse. The scenario is one that is often played out in the press, in which a care worker sexually abuses elderly patients in his or her care.

However, you are given very little information here and what you would do is undoubtedly treat the patient and establish how she contracted gonorrhoea.

The question states that she has a profound dementia, suggesting that abuse has occurred rather than consensual sex. Nonetheless, you need to establish the facts. You have a personal duty of care to the patient and next of kin to do this before contacting the police.

It is likely that the police will need to be called but first it would be worth talking things through and obtaining advice from the MDU. The advice may entail investigating the set-up at the nursing home, talking with the next of kin, (and social services if a social worker has been involved) and finely detailing any injuries that may be present on examination.

Only then should the decision to contact the police be made.



[Q: 3953] OnExamination 2012 - Infectious disease

Seventeen of twenty-four passengers on a Nile cruise develop bloody diarrhoea on the third day.

Which of the following organisms is the likely cause?

- 1- Entamoeba histolytica
- 2- Giardia lamblia

- 3- Schistosoma mansoni
- 4- Shigella dysenteriae
- 5- Vibrio cholerae

Answer & Comments

Answer: 4- Shigella dysenteriae

Dysentery is characterised by the passing of frequent (sometimes very frequent) stools, that may contain blood, mucus or pus.

Shigella dysenteriae is responsible for bacillary dysentery, a disease most often associated with crowded, unsanitary conditions. Other species of Shigella may produce milder forms of diarrhoeal disease.

Dysentery is an oral infection transmitted via faecal contamination of water or food. During the one to four day incubation period, penetration of bacteria into the mucosal epithelial cells of the intestine causes an intense irritation of the intestinal wall, producing cramps and a watery, bloody diarrhoea.



[Q: 3954] OnExamination 2012 - Infectious disease

Which of the following statements regarding Japanese encephalitis is most true?

- 1- Is endemic in East Africa
- 2- It is a DNA virus
- 3- It is only recognised in travellers who have spent prolonged periods in endemic areas
- 4- Previous exposure to a flavivirus predisposes to increased risk of death on infection with Japanese encephalitis
- 5- Transplacental transmission occurs

Answer & Comments

Answer: 5- Transplacental transmission occurs

Japanese encephalitis is an RNA virus which is endemic in India, East Asia, Malaysia and the Phillipines.

Previous infection by a pathogen which is a member of the Flavivirus family seems to protect against serious disease or death when infection occurs with another member of the Flavivirus family. For instance previous exposure to dengue lowers the risk of death when infected by Japanese encephalitis.

Infection with Japanese encephalitis has been reported in travellers who have spent only short periods in endemic areas, and transplacental transmission can occur.

An immunisation is available for travellers.



[Q: 3955] OnExamination 2012 - Infectious disease

A 15-year-old girl presents with fever, malaise and sore throat.

Examination reveals a temperature of 38.3°C with cervical lymphadenopathy.

Her results show:

Haemoglobin 12.8 g/dL (11.5-16.5)

White cell count $9.8 \times 10^9/L$ (4-11 $\times 10^9$)

Neutrophils $3 \times 10^9/L$ (1.5-7 $\times 10^9$)

Lymphocytes $4.5 \times 10^9/L$ (1.5-4 $\times 10^9$)

Blood film reveals atypical mononuclear cells.

What is the most likely diagnosis?

- 1- Acute lymphoblastic leukaemia
- 2- Brucellosis
- 3- Epstein-Barr viral (EBV) infection
- 4- Hodgkin's disease
- 5- Sarcoidosis

Answer & Comments

Answer: 3- Epstein-Barr viral (EBV) infection

The diagnosis is EBV infection, infectious mononucleosis, which may be confirmed by the presence of immunoglobulin (Ig)M to EBV.



[Q: 3956] OnExamination 2012 - Infectious disease

A 70-year-old man presented to his GP with a two day history of increasing confusion. He also complained of a headache.

He was febrile on examination; nuchal rigidity was noted. A lumbar puncture was performed and CSF microscopy revealed:

WBC 800 cells/mL (< 5) 90% neutrophils. A few Gram positive diplococci were also noted.

What is the cause of his meningitis?

- 1- Cryptococcus neoformans
- 2- Haemophilus influenzae
- 3- Listeria monocytogenes
- 4- Neisseria meningitidis
- 5- Streptococcus pneumoniae

Answer & Comments

Answer: 5- Streptococcus pneumoniae

A question on Gram staining properties of organisms causing meningitis.

Pneumococcal meningitis is commoner in older patients.

Neisseria meningitidis is a Gram negative diplococcus whilst Haemophilus influenzae is a Gram negative bacillus.

Listeria monocytogenes is a cause of neonatal meningitis, and is a small Gram positive bacillus that is carried in the intestine and vagina and may be transmitted to the neonate during the birth process.

Cryptococcus neoformans is a fungus and yeast cells may be seen on microscopic examination of the cerebrospinal fluid (CSF).



[Q: 3957] OnExamination 2012 - Infectious disease

A 50-year-old man comes to clinic and asks for advice about his risk of infection.

Twenty years ago he had been involved in a road traffic accident and had sustained a splenic laceration, requiring an emergency splenectomy.

Which of the following options offers the best advice?

- 1- He does not need prophylactic antibiotics due to the amount of time that has elapsed since his surgery
- 2- He has no increased risk of acquiring malaria when travelling to an endemic region
- 3- He has no increased risk of infection since he has been well for 20 years following surgery
- 4- He should receive pneumococcal vaccine
- 5- There is no increased risk of infection in patients who undergo splenectomy due to trauma

Answer & Comments

Answer: 4- He should receive pneumococcal vaccine

Splenectomised patients are at increased risk of infection with encapsulated bacteria and infections that are filtered by the spleen (for example, malaria).

When elective splenectomy is planned, vaccines to pneumococcus and meningococcus should be given two weeks pre-surgery to allow an antibody response to evolve.

Patients who have emergency splenectomies should be vaccinated post-operatively, though the response may not be as efficient.



[Q: 3958] OnExamination 2012 - Infectious disease

An elderly woman who had her right first metatarsal amputated two weeks previously for diabetic gangrene, presented with right foot pain, rash and fever. There were features of inflammation around the amputated area.

Which one of the following investigations would you like to order to confirm the diagnosis?

- 1- Bone scan
- 2- CT scan
- 3- Indium-labelled leukocyte scanning
- 4- MRI scan
- 5- Right foot x ray

Answer & Comments

Answer: 4- MRI scan

Plain radiography of chronic osteomyelitis typically shows patchy osteopenia or frank bone destruction, loss of definition of the cortex, areas of sclerosis, or periosteal reaction with new bone formation. These changes take many weeks to develop fully.

For more rapid clarification of diagnosis however, specialised imaging is needed.

Computed tomography (CT) scanning may be able to identify cortical erosion that has been missed on plain films and can demonstrate sequestra within bone.

There is a lack of sensitivity early in the disease. White cell isotope scanning is widely used but there is a lack of consensus on the utility of various tests.

Conventional three-phase technetium bone scans are sensitive but non-specific. Specificity may be increased by the addition of indium-labelled leukocyte scanning.

Magnetic resonance imaging (MRI) is the standard and best method for diagnostic imaging of osteomyelitis. It can detect intra-

and extraosseous oedema, abscesses, dead bone, and sinus tracts. It can distinguish active from inactive infection.



[Q: 3959] OnExamination 2012 - Infectious disease

A 25-year-old Turkish woman arrived in the United Kingdom with a three month history of weight loss and intermittent fevers.

On examination, the patient was emaciated, febrile (39°C) and pale, and an enlarged liver (5 cm below the costal margin) and spleen (10 cm below the costal margin) were present.

Investigations revealed:

Haemoglobin 7.2 g/dL (11.5-16.5)

White cell count $2.4 \times 10^9/L$ (4-11 $\times 10^9$)

Platelet count $117 \times 10^9/L$ (150-400 $\times 10^9$)

Thick and thin films no parasites identified.

CXR normal.

What is the most likely diagnosis?

- 1- HIV infection
- 2- Infectious mononucleosis
- 3- Malaria
- 4- Miliary tuberculosis
- 5- Visceral leishmaniasis

Answer & Comments

Answer: 5- Visceral leishmaniasis

The clinical history given here is typical of visceral leishmaniasis.

Leishmaniasis is a vector-borne disease caused by obligate intra-macrophage protozoa, transmitted to humans by phlebotomine sandflies. It is endemic in large areas of the tropics, subtropics and Mediterranean basin. There are four main clinical syndromes: cutaneous, mucocutaneous, visceral (also known as kala-azar) and post kala-azar dermal leishmaniasis.

In cutaneous leishmaniasis patients generally present with ulcers or nodules. These usually heal spontaneously, but slowly, in immunocompetent individuals with resultant disfiguring scars.

Muco-cutaneous leishmaniasis is characterised by progressively destructive ulcerations of the mucosa extending from the nose and mouth to the pharynx and larynx, which are not self-healing. *Leishmania braziliensis* is responsible for the majority of these cases.

Post kala-azar dermal leishmaniasis is characterised by a macular, maculopapular or nodular rash and is a complication of visceral leishmaniasis frequently observed after treatment. It can also occur in immunosuppressed individuals, and is highly infectious.

Visceral leishmaniasis, as described here, is fatal if left untreated. It is caused by the *Leishmania donovani* complex (*L. donovani sensu stricto* in East Africa and India, and *L. infantum* in Europe, North Africa and Latin America). Following an incubation period of 2-6 months, patients present with persistent systemic infection (fever, malaise, loss of appetite and weight loss) and parasitic infection of the blood and reticulo-endothelial system (resulting in lymphadenopathy and hepatosplenomegaly). Anaemia is usually caused by persistent inflammation and hypersplenism, and can be exacerbated by bleeding.

Diagnosis can be difficult. Pancytopenia is often present, and is supportive of the diagnosis. There is also often marked polyclonal hypergammaglobulinaemia. Visualisation of the parasite (amastigote form) from lymph nodes, bone marrow or spleen is used as a confirmatory test. PCR can be used to detect the parasite in the blood. Anti-leishmanial antibodies can be detected, but they remain positive up to several years after cure and therefore cannot be used to detect

relapse. In addition there is a significant incidence of asymptomatic infection, and therefore seroprevalence in healthy populations.

Treatment of visceral leishmaniasis relies on specific therapies and aggressive management of concomitant infection, anaemia, hypovolaemia and malnutrition. First line antimonials are sodium stibogluconate and meglumine antimoniate. Adverse effects include cardiac arrhythmias and acute pancreatitis. Amphotericin B is increasingly being used. Vaccines are being developed, and novel drugs (including miltefosine and paromomycin) have been introduced. A elimination programme has been introduced to the Indian subcontinent.

Whilst opportunistic infections in HIV can present like this, there are no other indications in the question to suggest this is the diagnosis.

The history is too long for infectious mononucleosis.

Malaria is not common in Turkey, and we are told there are no parasites seen (although remember 3 negative films are needed to exclude the diagnosis).

Miliary TB is a possibility, but does not classically cause this level of hepatosplenomegaly.



[Q: 3960] OnExamination 2012 - Infectious disease

Which of the following is true of anthrax?

- 1- Eschars are usually painless.
- 2- Gastrointestinal anthrax is the most usual form of disease in humans.
- 3- It causes trivial disease in the host herbivore population.
- 4- It is caused by an aerobic, Gram negative rod.

- 5- Sputum culture has a high yield in inhalational anthrax.

Answer & Comments

Answer: 1- Eschars are usually painless.

Anthrax is caused by the Gram positive, aerobic, non-motile *Bacillus anthracis*.

It produces serious disease in the herbivore host and carnivores acquire the disease from either consuming the spores from the dead animal or by contact.

In humans, cutaneous disease is most common and a painless, black, indurated eschar frequently forms. Mortality from cutaneous disease is 20% if untreated whereas inhalational anthrax may have a mortality of 90% if untreated.

Inhalational anthrax is associated with a poor yield from sputum culture with the greatest yield from blood culture.



[Q: 3961] OnExamination 2012 - Infectious disease

A 25-year-old male has a history of travel to South East Asia on holiday for two weeks.

Five weeks ago he developed fever, pharyngitis, myalgia and a skin rash. The patient also has a generalised lymphadenopathy.

There two Paul-Bunnell tests which are negative one week apart.

What is the most likely diagnosis?

- 1- Acute HIV syndrome
- 2- CMV mononucleosis
- 3- Infectious mononucleosis
- 4- Streptococcal pharyngitis
- 5- Toxoplasmosis

Answer & Comments

Answer: 1- Acute HIV syndrome

With streptococcal pharyngitis the patient is more likely to have a sore throat, fever, chills, malaise and abdominal complaints. It has a short incubation period of one to four days. Both the Paul-Bunnell test and DNA polymerase chain reaction (PCR) for HIV will be negative.

Infectious mononucleosis has similar signs and symptoms to acute HIV syndrome but with a positive Paul-Bunnell test.

Cytomegalovirus (CMV) mononucleosis has a longer incubation period of 20-60 days. The illness takes two to six days. There are fever, chills, profound fatigue, malaise and myalgia.

With toxoplasmosis there are usually single or multiple enlarged cervical lymph nodes which are discrete, non-tender and vary in firmness.

The patient may also have

Fever

Headache

Malaise

Fatigue

Myalgia

Sore throat

Maculopapular rash

Meningoencephalitis

Confusion.

Cerebrospinal fluid (CSF) amplification DNA for toxoplasmosis gives the confirmatory diagnosis.



[Q: 3962] OnExamination 2012 - Infectious disease

A 35-year-old Nigerian female was assessed in an antenatal clinic. She was clinically well.

Antenatal screening for syphilis revealed the following results:

Treponemal EIA total Detected

Treponemal EIA IgM Not detected

Treponemal TPPA Detected 1:160

Treponemal RPR Not detected

What is the likely diagnosis?

- 1- Acute syphilis infection
- 2- Early latent syphilis infection
- 3- Late latent syphilis infection
- 4- Non-specific reactivity
- 5- Yaws

Answer & Comments

Answer: 3- Late latent syphilis infection

It is important that the serology is correctly interpreted and during pregnancy this lady is referred to a GU clinic for treatment with benzathine penicillin if not previously treated.

The detection of treponemal EIA total is confirmed by treponemal TPPA so this result is not a false positive. As treponemal IgM is not detected this is not consistent with acute infection.

In the absence of symptoms, late latent infection is more likely than early latent infection.

These results are unlikely to be cross reactivity secondary to yaws.



[Q: 3963] OnExamination 2012 - Infectious disease

Which one of the following drugs is associated with hypersensitivity reactions?

- 1- Atazanavir
- 2- Lamivudine
- 3- Nevirapine
- 4- Tenofovir
- 5- Zidovudine

Answer & Comments

Answer: 3- Nevirapine

Nevirapine can cause acute hepatitis and skin rash as a part of hypersensitive reaction especially when the CD4 count is over 250 cells/ml in women and over 400 cells/ml in men. Nevirapine should not be prescribed in those conditions.

Atazanavir causes hyperbilirubinaemia and rarely renal stones.

Lamivudine does not cause hypersensitivity reaction.

Tenofovir causes proximal tubular damage.

Zidovudine causes bone marrow suppression.

Reference:

Danino S, Yoganathan K, Jones P, Banner T. Urolithiasis in an HIV infected patient - a link with atazanavir? 2007; BHIVA spring meeting, Edinburgh.



[Q: 3964] OnExamination 2012 - Infectious disease

A 57-year-old woman develops a blistering rash around the midriff and is diagnosed with Herpes zoster. She is treated with aciclovir.

Which of the following is responsible for the activation of aciclovir?

- 1- Integrase
- 2- Polymerase
- 3- Protease
- 4- Reverse transcriptase
- 5- Thymidine kinase

Answer & Comments

Answer: 5- Thymidine kinase

This is a variation on the aciclovir theme.

Aciclovir acts through inhibition of viral deoxyribonucleic acid (DNA) polymerase but it

is a pro-drug and first requires phosphorylation by thymidine kinase.



[Q: 3965] OnExamination 2012 - Infectious disease

A 22-year-old woman is referred to hospital with a one week history of fever, headache and fatigue. She was a 'mail order' bride who had recently moved to the United Kingdom from Thailand to live with her new husband.

Based on her travel history which disease can be excluded from the following list of differentials?

- 1- Cerebral toxoplasmosis
- 2- HIV seroconversion illness
- 3- Japanese B encephalitis
- 4- Tuberculosis
- 5- Yellow fever

Answer & Comments

Answer: 5- Yellow fever

Yellow fever occurs only in tropical South America and in sub-Saharan Africa.

Japanese B encephalitis has a high prevalence in south east Asia.

All of the other diseases listed are widespread globally.



[Q: 3966] OnExamination 2012 - Infectious disease

A 22-year-old female student attended the casualty department complaining of fever and rigors for two days.

She had returned from a sabbatical in Africa six weeks previously.

She was febrile (39.9°C) and a mild petechial rash was also noted.

Laboratory investigations showed:

Hb 10.1 g/dL (11.5-16.5)

WBC $3.0 \times 10^9/L$ (4-11 $\times 10^9$)

Platelets $115 \times 10^9/L$ (150-400 $\times 10^9$)

Prothrombin time Normal

What is the most likely diagnosis?

- 1- Acute HIV infection (seroconversion illness)
- 2- Cytomegalovirus (CMV) infection
- 3- Dengue fever
- 4- Plasmodium falciparum malaria
- 5- Typhoid fever

Answer & Comments

Answer: 1- Acute HIV infection (seroconversion illness)

A difficult question that partly hinges on the incubation times of these illnesses.

The incubation time is too long for dengue, typhoid and falciparum malaria.

The presentation is not typical of CMV.

Acute human immunodeficiency virus (HIV) presents two weeks to three months after exposure to the virus; the illness typically consists of:

Fever

Arthritis

Rash

Lymphadenopathy.

The presentation given here is not characteristic of acute HIV, but is the most reasonable of the options listed.



[Q: 3967] OnExamination 2012 - Infectious disease

A 35-year-old man returned from a two week holiday complaining of pain in the loins and painful swollen knees.

On examination he was afebrile and had significant bilateral knee effusions. Mild penile erythema was also noted.

Laboratory investigations showed:

Hb 15.6 g/dl (13.0-18.0)

WBC $16.2 \times 10^9/L$ (4-11)

Neutrophils $14.1 \times 10^9/L$ (1.5-7)

ESR 65 mm/hr (0-15 mm/1st hr)

Rheumatoid factor 10 U/l

Urinalysis No cells, casts or bacteria seen

What is the most likely diagnosis?

- 1- Arthritis due to Neisseria gonorrhoeae infection
- 2- Lymphogranuloma venereum
- 3- Reactive arthritis
- 4- Reiter's syndrome
- 5- Rheumatoid arthritis

Answer & Comments

Answer: 1- Arthritis due to Neisseria gonorrhoeae infection

The history is relatively acute with the arthritis and urethritis plus there is a neutrophilia.

The diagnostic possibilities include Reiter's or a gonococcal arthritis.

However, in this scenario, the acuteness of the illness on return from a holiday with no evidence of a preceding illness such as diarrhoea, and involvement of the larger joints, that is, knees, with effusions - suggests gonorrhoea.

Guidelines:

British Association for Sexual Health and HIV



[Q: 3968] OnExamination 2012 - Infectious disease

A 30-year-old man developed a febrile illness three days after returning from a holiday in Thailand. He was admitted complaining of severe myalgia.

On examination he was febrile (39 C) with a diffuse macular rash on the trunk. There was no lymphadenopathy.

Investigations revealed:

Haemoglobin 15.1 g/dL(13.0-18.0)

White cell count $7.5 \times 10^9/L$ (4-11)

Platelet count $105 \times 10^9/L$ (150-400)

Serum total bilirubin 18 $\mu\text{mol/L}$ (1-22)

Serum alanine aminotransferase 120 U/L(5-35)

What is the most likely diagnosis?

- 1- Acute HIV infection (seroconversion illness)
- 2- Dengue fever
- 3- Hepatitis E
- 4- Secondary syphilis
- 5- Typhoid

Answer & Comments

Answer: 2- Dengue fever

The symptoms are most consistent with dengue fever.

While acute retroviral syndrome (acute HIV) is associated with a widespread macular rash, it is also usually associated with pharyngitis and generalised lymphadenopathy.

Hepatitis E presents in a similar manner to hepatitis A, that is, as an acute febrile illness with jaundice.

The history is too acute for secondary syphilis, which is not typically associated with myalgia.

Typhoid fever is usually a diarrhoeal illness associated with subtle 'rose spots' on the abdomen.

Dengue fever is caused by an arthropod-borne Flavivirus. The disease has an incubation period of approximately seven days, followed by headaches and retro-orbital pain. Symptoms evolve rapidly and severe musculoskeletal pain is a prominent feature, with a maculopapular rash.



[Q: 3969] OnExamination 2012 - Infectious disease

Which of the following investigations is used to monitor the treatment of infective endocarditis?

- 1- Blood culture
- 2- C reactive protein
- 3- Echocardiography
- 4- Erythrocyte sedimentation rate
- 5- Serum bactericidal titres of antibiotics

Answer & Comments

Answer: 2- C reactive protein

Serum bactericidal titres against the infecting organism are no longer recommended.

There was always great variation in the monitoring methods used for these tests and in the interpretation of their results. At best they could only predict bacteriological not clinical cure, and bacteriological failure is very rare.

The most useful laboratory test for monitoring the response to treatment (which is usually obvious clinically) is serial C reactive protein estimation.

This is of much more use than the erythrocyte sedimentation rate, which is much slower to fall.



[Q: 3970] OnExamination 2012 - Infectious disease

Which of the following infections is least likely to cause myocarditis?

- 1- Chagas disease
- 2- Coxsackie virus
- 3- Diphtheria
- 4- Syphilis
- 5- Toxoplasmosis

Answer & Comments

Answer: 4- Syphilis

Quaternary syphilis involves the cardiovascular system, commonly in the form of ascending aortic aneurysm and aortic regurgitation.

Diphtheria, coxsackie virus, Chagas disease and toxoplasmosis are all associated with myocarditis.



[Q: 3971] OnExamination 2012 - Infectious disease

A 63-year-old female presents with a one day history of confusion with headaches.

On examination she is confused, with a Glasgow coma scale of 13 and a temperature of 39.5°C.

She has nuchal rigidity and photophobia.

CSF examination reveals a glucose of 0.5 mmol/l (3.3-4.4), a white cell count of 2500 per mm and Gram positive cocci in pairs.

Which of the following is correct?

- 1- A characteristic rash would be expected
- 2- Nerve deafness would be a common complication in this case
- 3- Rifampicin should be given to close contacts
- 4- The most likely infective organism is Staphylococcus aureus
- 5- The organism is likely to be penicillin resistant

Answer & Comments

Answer: 2- Nerve deafness would be a common complication in this case

This patient has pneumococcal meningitis, caused by the Gram positive coccus Strep. pneumoniae.

This is the second commonest cause of bacterial meningitis (commonest in the elderly) and is associated with the highest

mortality (20%) and highest morbidity, such as deafness which may occur in 50%.

Contacts do not require treatment and there is no rash associated with pneumococcal meningitis.

Meningococcus is Gram negative.



[Q: 3972] OnExamination 2012 - Infectious disease

A 69-year-old male presented with fever and difficulty in breathing.

He is alert and well co-ordinated with respect to time and place but has trouble placing words or pictures into categories. He used to be bilingual but now has lost the ability to speak French and he can speak only English. He also has trouble following some verbal commands.

The coronal FLAIR magnetic resonance image looks as follows:

What is the most likely diagnosis?

- 1- Cryptococcal meningitis
- 2- Haemophilus meningitis
- 3- Herpes simplex encephalitis
- 4- Neurosyphilis
- 5- Progressive multifocal leukoencephalopathy

Answer & Comments

Answer: 3- Herpes simplex encephalitis

Herpes simplex encephalitis affects the temporal lobe in most cases.

If the temporal lobe is affected the following signs will be seen:

Disturbance of auditory sensation and perception

Disturbance of selective attention to auditory and visual input

Disorders of visual perception

Impaired organisation and categorisation of verbal material

Disturbance of language comprehension

Impaired long term memory

Altered personality and affective behaviour and

Altered sexual behaviour.

The MRI just confirms the diagnosis.

Cryptococcal meningitis is the wrong answer because it is a lot more common in people with a lowered immunity. Its common symptoms are often:

Headache

Altered mental status including personality changes

Confusion

Lethargy

Obtundation and

Coma.

Haemophilus meningitis is often preceded by an upper respiratory illness. Initial manifestations include:

Lethargy

Fever

Headache

Photophobia

Meningitis

Irritability

Anorexia

Nausea or

Vomiting.

Neurosyphilis often manifests with:

Psychosis

Delirium and

Dementia.

There could be history of a painless ulcerative chancre.

Progressive multifocal leukoencephalopathy is usually found in people with a lowered immunity such as diabetes, HIV/AIDS and on cancer chemotherapy. There are usually:

Headaches

Loss of co-ordination

Loss of language ability

Memory loss

Vision problems and

Weakness of the legs and arms.

It is diagnosed by finding the JC viruses by DNA polymerase chain reaction (PCR) from the cerebrospinal fluid (CSF).



[Q: 3973] OnExamination 2012 - Infectious disease

A 24-year-old patient presents with acute lymphoblastic leukaemia for which she is taking chemotherapy.

One week after having her glucocorticoids tapered the patient now reports having a cough with progressive difficulty in breathing, a fever and night sweats.

On examination the patient has severe dyspnoea, central cyanosis and is febrile to touch. The patient has oral thrush. Her temperature 38.5°C, BP 118/76 mmHg and HR-140 beats/minute.

The oxygen saturation is 84% at rest and 76% on exertion. The respiratory rate is 40 beats/minute, there are some basal crepitations and the rest of the examination findings are not significant.

On doing a bronchial alveolar lavage and stained with methenamine silver the patient's chest radiograph looks as follows.

What is the most likely diagnosis?

- 1- Legionellosis
- 2- Lymphocytic interstitial pneumonia
- 3- Pneumocystis jiroveci pneumonia
- 4- Pulmonary embolism
- 5- Tuberculosis

Answer & Comments

Answer: 3- Pneumocystis jiroveci pneumonia

The clinical manifestations above are of PCP.

The disease usually develops after one to two weeks of tapering the dose of the steroids. It is usually progressive, with worsening dyspnoea, a dry cough, weight loss and night sweats.

The signs on examination usually depend on the severity of the disease. The chest radiography often shows various manifestations, and is not diagnostic but usually shows diffuse infiltrates, sparing mainly the upper and lower zones. PCP can be stained with methenamine silver where it attaches to the walls of the Pneumocystis jiroveci pneumonia.

Legionellosis is the wrong answer because these patients often have temperatures greater than 40°C, chills, cough and pleuritic chest pain. There is also a likelihood of neurological symptoms such as headache, lethargy, encephalopathy and mental state changes.

Lymphocytic interstitial pneumonia is the wrong option despite it being similar to Pneumocystis carinii pneumonia by causing a fever, cough and dyspnoea. These patients could also have a generalised lymphadenopathy, hepatomegaly and parotid enlargement which are not found in PCP.

PCP is similar to an acute pulmonary infarction which often presents with pleuritic chest pain, breathlessness, haemoptysis and a fever.

Patients with tuberculosis often have a productive cough for more than two weeks with weight loss, night sweats and evening fevers. There is more likely to be some chest pain and difficulty in breathing.



[Q: 3974] OnExamination 2012 - Infectious disease

A 19-year-old gap year student presents to the GP feeling unwell with fevers, lethargy, right upper quadrant pain, a dry cough and shortness of breath over the past few days. She has returned from an operation Raleigh assignment in Uganda a few weeks ago.

Her only past medical history of note is that she reports an itchy area of skin on her upper thigh shortly after swimming in a local lake. Examination is unremarkable apart from some right upper quadrant tenderness.

Investigations show

Haemoglobin 11.4 g/dl(11.5-16.5)

White cell count $11.2 \times 10^9/L$

(Raised eosinophils) (4-11)

Platelets $180 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 4.4 mmol/l (3.5-5)

Creatinine 110 $\mu\text{mol/l}$ (79-118)

Which of the following is the most likely diagnosis?

- 1- Churg-Strauss syndrome
- 2- Extrinsic allergic asthma
- 3- Hydatid disease
- 4- Schistosomiasis
- 5- Weil's disease

Answer & Comments

Answer: 4- Schistosomiasis

The initial area of itching may be related to swimmers' itch, which is related to the entry of the parasite through the skin after

swimming in an area where the parasite is present in water.

The raised eosinophil count supports the diagnosis, and the dry cough raises the possibility of parasitic migration to the lungs. Diagnosis is based upon the presence of parasites in the stool, or in the urine in the case of *S. haematobium*.

Praziquantel is the treatment of choice, given as a single dose with follow up in four to six weeks.



[Q: 3975] OnExamination 2012 - Infectious disease

A 62-year-old lady is due to attend her dentist for a hygiene appointment for scaling.

She has a history of mitral valve prolapse with regurgitation and is allergic to penicillin.

Which of the following antibiotics would be the most appropriate choice for prophylaxis in this lady?

- 1- No antibiotic prophylaxis
- 2- Oral clindamycin
- 3- Oral doxycycline
- 4- Oral erythromycin
- 5- Oral ofloxacin

Answer & Comments

Answer: 1- No antibiotic prophylaxis

NICE guidance Of 2008 suggests that prophylaxis is not required during dental procedures.



[Q: 3976] OnExamination 2012 - Infectious disease

A patient presents with a 36 hour history of Varicella zoster in the T4 dermatome. She complains of severe pain in the skin supplied by T4.

What is the most appropriate management?

- 1- Aciclovir
- 2- Carbamazepine
- 3- Famciclovir
- 4- Nothing
- 5- Prednisolone

Answer & Comments

Answer: 1- Aciclovir

Aciclovir and famciclovir may be used to treat herpes zoster. They both reduce time to healing and resolution of associated pain.

Aciclovir is now a generic medication and therefore will be cheaper than famciclovir and is the most cost effective of the treatments listed.

Early use of steroids in herpes zoster may also reduce the amount of analgesia required and the length of illness.

BMJ wrote a clinical review of the treatment of herpes zoster in 2003. The main take home message was that appropriate treatment of herpes zoster can control acute symptoms and reduce the risk of longer term complications. You need a log in to obtain full access to the article but a summary is provided free of charge.

In March 2010, NICE updated their guidance on the treatment of neuropathic pain. First line treatment of post herpetic neuralgia would now include amitriptyline or pregabalin.

CKS have also issued guidance on the treatment of herpes zoster. This guidance is generally in keeping with that issued by NICE. They add that, although carbamazepine has evidence to support its use in the treatment of post herpetic neuralgia, the potential for serious adverse side effects and the lack of a license has prevented them from recommending it as a primary care treatment.



[Q: 3977] OnExamination 2012 - Infectious disease

A 57-year-old woman develops a blistering rash around the midriff and is diagnosed with herpes zoster.

She is treated with aciclovir.

Through inhibition of which of the following does aciclovir function?

- 1- Integrase
- 2- Polymerase
- 3- Protease
- 4- Reverse transcriptase
- 5- Thymidine kinase

Answer & Comments

Answer: 2- Polymerase

Aciclovir is a synthetic purine nucleotide analogue and as such is a specific inhibitor of herpesvirus DNA polymerase.



[Q: 3978] OnExamination 2012 - Infectious disease

A 38-year-old male with a diagnosis of HIV presents with lethargy, confusion, personality change and a seizure.

CT shows multiple ring enhancing mass lesions in both cerebral hemispheres.

What treatment is indicated?

- 1- Broad spectrum antibiotics
- 2- Corticosteroids
- 3- Ketoconazole
- 4- Pyrimethamine and sulfonamide
- 5- Rifampicin and pyrazinamide

Answer & Comments

Answer: 4- Pyrimethamine and sulfonamide

Cerebral Toxoplasma infection gives rise to multiple ring enhancing lesions on CT and MRI scanning.

Multiple cerebral abscesses are commonly present, which may result in multifocal symptoms, including

Visual field deficits

Focal seizures

Aphasia

Hemiparesis or hemisensory deficits

Cranial nerve palsies

Cerebellar dysfunction.

Non-focal symptoms such as a confusional state or personality disorder may manifest initially, but focal symptoms eventually appear as the disease progresses.



[Q: 3979] OnExamination 2012 - Infectious disease

A 15-year-old boy is referred by his GP with a two week history of general malaise, fatigue and pharyngitis.

On examination multiple small lymph nodes were palpable in the neck, axillae and groins.

Investigations revealed:

Haemoglobin 12.5g/dl(13.0-18.0)

WBC $16.0 \times 10^9/L$ (4-11)

Platelets $160 \times 10^9/L$ (150-400)

Blood film Lymphocytosis noted

What is the most likely diagnosis?

- 1- Acute lymphoblastic leukaemia
- 2- Cytomegalovirus infection
- 3- Epstein-Barr virus infection
- 4- Hodgkin's disease
- 5- Toxoplasmosis

Answer & Comments

Answer: 3- Epstein-Barr virus infection

Acute Epstein-Barr virus (EBV) typically presents with a history of one to two weeks of

fatigue and malaise, fever, pharyngitis, and symmetrical, bilateral lymphadenopathy. Heterophil antibody tests are usually positive. Mild transient thrombocytopenia is not uncommon in EBV infectious mononucleosis.

Cytomegalovirus (CMV) mononucleosis has a lower incidence of pharyngitis and cervical adenopathy.

Primary toxoplasmosis is acquired via ingestion of undercooked meat containing toxoplasma cysts, or ingestion of fresh food contaminated by toxoplasma excreted in cats' faeces. The infection is asymptomatic in 80-90% of immunocompetent patients.

Highly characteristic of toxoplasmosis is asymmetrical lymphadenopathy limited to an isolated lymph node group. Patients with toxoplasmosis have little or no fever, fatigue, or pharyngitis.

CMV infectious mononucleosis may be indistinguishable in clinical presentation from EBV but is usually not accompanied by posterior cervical adenopathy; non-exudative pharyngitis is minimal or absent.

The diagnosis of acute lymphoblastic leukaemia (ALL) and Hodgkin's disease (HD) is made by a combination of blood film examination, bone marrow aspiration and biopsy and lymph node biopsy.



[Q: 3980] OnExamination 2012 - Infectious disease

A 35-year-old woman presents with fever, rigors, malaise and weight loss.

She had undergone prosthetic valve replacement one month before. C3 level was reduced and echocardiography showed small vegetations.

Which micro-organism is most likely to be responsible for this?

- 1- Candida
- 2- Coxiella burnetii

- 3- Staphylococcus aureus
- 4- Staphylococcus epidermidis
- 5- Streptococcus viridans

Answer & Comments

Answer: 4- Staphylococcus epidermidis

Prosthetic valve endocarditis arising within two months of valve surgery is generally the result of intraoperative contamination of the prosthesis or a bacteraemia postoperative complication.

The nosocomial nature of these infections is reflected in their primary microbial causes:

Coagulase-negative staphylococci (Staphylococcus epidermidis)

S. aureus

Facultative Gram negative bacilli

Diphtheroids

Fungi.

Wang A, Athan E, Pappas PA, Fowler VG Jr, Olaison L, Paré C, et al. Contemporary clinical profile and outcome of prosthetic valve endocarditis. JAMA. Mar 28 2007;297(12):1354-61.

Whilst a recent study (Wang A, Athan E, Pappas PA, Fowler VG Jr, Olaison L, Paré C, et al. Contemporary clinical profile and outcome of prosthetic valve endocarditis. JAMA. Mar 28 2007;297(12):1354-61) did show that staphylococcal aureus was the most common cause of prosthetic valve infective endocarditis it is thought that this may have been due to recruitment or referral bias. The trend has not been replicated in all subsequent studies. Therefore, for the exam it is safer currently to state that Staphylococcus epidermidis is the commonest colonising organism within 6 months of implantation of a prosthetic valve.

The oral cavity, skin, and upper respiratory tract are the respective primary portals for the viridans Streptococci, Staphylococci, and

HACEK organisms (Haemophilus, Actinobacillus, Cardiobacterium, Eikenella, and Kingella), causing community-acquired native valve endocarditis.

Streptococcus bovis originates from the gastrointestinal tract, where it is associated with polyps and colonic tumours, and Enterococci enter the bloodstream from the genitourinary tract.



[Q: 3981] OnExamination 2012 - Infectious disease

A 50-year-old man presented to hospital feeling generally unwell for three days.

He had returned from a business trip to Thailand six weeks previously and had taken mefloquine as prophylaxis against malaria.

On examination he was afebrile, temperature 36.5°C, pulse was 100/minute and regular, his BP was 85/60 mm Hg.

Investigations showed:

Hb 14.2 g/dL (13.0-18.0)

WBC 19.0 x 10⁹/L (4-11 x10⁹)

Neutrophils 18.0 x 10⁹/L (1.5-7.0 x10⁹)

AST 72 U/L (1-31)

Alkaline phosphatase 255 U/L (45-105)

What is the most likely diagnosis?

- 1- Acute HIV infection (seroconversion illness)
- 2- Dengue fever
- 3- Gram negative bacteraemia
- 4- Hepatitis B
- 5- Mefloquine-induced hepatitis

Answer & Comments

Answer: 3- Gram negative bacteraemia

A difficult question.

The neutrophilia essentially excludes most viral causes.

The presentation is not typical of acute human immunodeficiency virus (HIV) (fever, pharyngitis, rash and lymphadenopathy).

Mefloquine can cause abnormal liver function tests, but is not common.

Even though the patient is afebrile, the likeliest diagnosis is therefore Gram negative bacteraemia.



[Q: 3982] OnExamination 2012 - Infectious disease

Which of the following is correct regarding toxoplasmosis?

- 1- Can present with fits in patients with AIDS
- 2- Infection in the first trimester of pregnancy is seldom harmful to fetus
- 3- Infection is usually by respiration
- 4- Prophylactic immunoglobulins should be given to pregnant women if their IgM anti-toxoplasma antibodies detected
- 5- Raw eggs are an important source of infection

Answer & Comments

Answer: 1- Can present with fits in patients with AIDS

Transmission of Toxoplasma gondii occurs after ingestion of cysts from contact with cat faeces or raw/undercooked meat. The definitive host is the cat.

Oocysts excreted with cat faeces can remain in soil for months.

Risk of fetopathy is reduced by more than 50% if spiramycin, which can prevent maternal-fetal transmission, is given to mothers.



[Q: 3983] OnExamination 2012 - Infectious disease

A 43-year-old Pakistani female presents with a two month history of weight loss, fever and

night sweats.

Chest x ray reveals a large right sided pleural effusion.

What investigation is most likely to confirm a diagnosis of suspected TB?

- 1- CT scan of thorax
- 2- Interferon gamma releasing assay (IGRA)
- 3- Pleural aspirate
- 4- Pleural biopsy
- 5- Sputum analysis

Answer & Comments

Answer: 4- Pleural biopsy

For suspected pleural TB, pleural biopsy sent in normal saline for AFB smear, mycobacterial culture and histology is the most sensitive method for laboratory confirmation.

In cases of suspected TB, every effort should be made to confirm a suspected diagnosis by culture.

Susceptibility testing is important as detection of resistance alters the combination of drugs and duration of treatment.



[Q: 3984] OnExamination 2012 - Infectious disease

A 36-year-old Caucasian woman was successfully treated for *Pneumocystis jirovecii* pneumonia (PCP).

She was re-admitted with acute breathlessness with left-sided chest pain ten days after her discharge from the hospital. Examination revealed that she was hypoxic and found to have diminished breath sounds on the left side of chest.

What is the most likely cause of her recent admission?

- 1- Acute myocardial infarction
- 2- Acute pericarditis
- 3- Acute pulmonary embolism

4- Left lobar pneumonia

5- Pneumothorax

Answer & Comments

Answer: 5- Pneumothorax

Pneumothorax is a well-known complication of PCP. An acute history of chest pain with breathlessness and diminished breath sounds is typical of pneumothorax.

Diminished breath sounds are not a feature of acute myocardial infarction or acute pericarditis.

Acute pulmonary embolism should be considered due to her recent admission but diminished breath sounds are not a feature.

There are no signs of consolidation to consider lobar pneumonia.



[Q: 3985] OnExamination 2012 - Infectious disease

A 50-year-old female presents with dyspnoea, a new murmur and fever and is diagnosed with infective endocarditis.

Which of the following is associated with the best prognosis?

- 1- Aortic valve infection
- 2- Culture negative endocarditis
- 3- Low complement levels
- 4- *Staphylococcus aureus* infection
- 5- *Streptococcus viridans* infection

Answer & Comments

Answer: 5- *Streptococcus viridans* infection

Features suggestive of a worse prognosis are:

Acute endocarditis (*Staphylococcus aureus*)

Heart failure

Intravenous drug abuse (often left and right sided disease)

Prosthetic valve infection

Infection of the aortic rather than mitral valve

Associated rhythm disturbance.

Subacute bacterial endocarditis
(Streptococcus viridans) has a better prognosis.



[Q: 3986] OnExamination 2012 - Infectious disease

A 41-year-old male has been diagnosed with infective endocarditis.

Which of the following is associated with the best prognosis?

- 1- Aortic valve infection
- 2- Intravenous drug abuse
- 3- Prosthetic valve infection
- 4- Staphylococcus aureus infection
- 5- Streptococcus viridans infection

Answer & Comments

Answer: 5- Streptococcus viridans infection

Features suggestive of a worse prognosis are

Acute endocarditis (Staphylococcus aureus)

Heart failure

IV drug abuse (often left and right sided disease)

Prosthetic valve infection

Infection of the aortic rather than mitral valve

Associated rhythm disturbance.

Subacute bacterial endocarditis
(Streptococcus viridans) has a better prognosis.



[Q: 3987] OnExamination 2012 - Infectious disease

A 65-year-old woman is diagnosed as having subacute bacterial endocarditis and

appropriate antibiotic therapy started.

Which of the following investigations is the most useful in order to monitor her response to antibiotics?

- 1- Serial blood cultures
- 2- Serial full blood count, monitoring the white cell count
- 3- Serial transthoracic echocardiography
- 4- Serum bactericidal activity
- 5- Serum C reactive protein (CRP) concentration

Answer & Comments

Answer: 5- Serum C reactive protein (CRP) concentration

C reactive protein (CRP) is a member of the pentraxin protein family, and levels are greatly elevated during acute inflammation.

CRP augments the immune response to certain antigens, activates complement, and increases the monocytic production of certain tissue factors.

CRP binds to bacterial surfaces, acting as an opsonin.

CRP concentrations are elevated in almost all inflammatory, infectious, and malignant diseases.

Serial measurements of CRP concentrations provide a simple, effective, non-invasive means of measuring response to antibiotic therapy.



[Q: 3988] OnExamination 2012 - Infectious disease

A 40-year-old farmer presented to the Emergency department with a 24 hour history of fever and increasing confusion.

On examination he was febrile 39.5°C. A generalised erythematous rash covering most of his body was observed. He also had a paronychia infection of his right index finger

with lymphangitis extending caudally and with axillary lymphadenopathy.

His heart rate was measured at 120 beats per minute with a blood pressure of 80/60 mmHg.

What is the most likely diagnosis?

- 1- Hantavirus infection
- 2- Leptospirosis
- 3- Orf
- 4- Staphylococcal toxic shock syndrome
- 5- Stevens-Johnson syndrome

Answer & Comments

Answer: 4- Staphylococcal toxic shock syndrome

The history is typical of staphylococcal toxic shock syndrome (TSS):

Shock

Fever

Confusion

Rash.

The primary source of infection in this case is the paronychia of his right index finger.

Hantavirus infections (viral zoonoses transmitted via rodents) typically have two distinct presentations, either

As a haemorrhagic fever with renal failure, or

As an acute pulmonary syndrome.

The former manifestation is commonest in the Far East and eastern Europe, while the latter is the predominant form in the southwestern United States and South America.

Leptospirosis does not typically cause a rash and is often associated with jaundice; leptospirosis would not explain the lesion on his finger.

Orf, a zoonotic infection caused by a pox virus, presents with painless ulcerated lesions on the

hands of farmers, but does not fully explain this clinical picture.

Stevens-Johnson syndrome typically starts with an erythema multiforme-type rash that spreads widely and involves the buccal mucosa and conjunctivae, often caused by antibiotic therapy; but does not fit the clinical picture presented here.



[Q: 3989] OnExamination 2012 - Infectious disease

A 15-year-old girl presents to casualty with mild gastrointestinal upset. She had recently returned from holiday where she had been swimming in the hotel pool.

What is the most likely causative organism?

- 1- Campylobacter jejuni
- 2- Cryptosporidium parvum
- 3- Salmonella enteridis
- 4- Shigella flexneri
- 5- Staphylococcus aureus

Answer & Comments

Answer: 2- Cryptosporidium parvum

Human cryptosporidiosis causes self-limited diarrhoeal illness in healthy individuals, mostly children; and severe prolonged diarrhoea in patients with AIDS.

Transmission is via human-to-human fecal-oral contamination.

Animals are the major reservoir and outbreaks have been associated with water supplies and public swimming pools.



[Q: 3990] OnExamination 2012 - Infectious disease

Which of the following statements concerning zoonotic diseases is true?

- 1- Brucellosis is characterised by neutrophil leucocytosis

- 2- Brucellosis is a recognised cause of spondylitis
- 3- Serological evidence of toxoplasmosis is rare in adults
- 4- Toxoplasmosis causes vasculitic anterior uveitis
- 5- Toxoplasmosis causes visceral larva migrans

Answer & Comments

Answer: 2- Brucellosis is a recognised cause of spondylitis

Brucellosis is a zoonosis, spreading from infected animals particularly cattle. There are four species: melitensis, abortus, suis, and canis.

Pasteurisation of milk has dramatically decreased the incidence in the UK.

Brucella are Gram negative bacilli which are fastidious. There is usually a history of exposure, and the symptoms are rather non-specific with fever, malaise, arthralgia and depression. Thirty five per cent have hepatosplenomegaly.

Leukopaenia is common, and 75% have a positive blood culture (90% of bone marrow cultures will be positive).

Toxoplasma is most frequent in farming communities where contact occurs with cats, and patients eat raw meat. Clinical manifestations include:

Focal choroidoretinitis

Granulomatous uveitis

Optic atrophy

Retinal detachment

Cataract

Posterior uveitis

Glaucoma.



[Q: 3991] OnExamination 2012 - Infectious disease

Which of the following is the drug of choice for the treatment of Chlamydia trachomatis infection during pregnancy?

- 1- Amoxicillin
- 2- Cephalosporin
- 3- Clindamycin
- 4- Metronidazole
- 5- Tetracycline

Answer & Comments

Answer: 1- Amoxicillin

Chlamydia infection in the non-pregnant state is usually treated with a tetracycline, or with erythromycin. More recently, however, amoxicillin has been found to be as effective as the latter.

During pregnancy, tetracycline therapy is contraindicated because of its incorporation into fetal bones and teeth.

Thus, of the options listed, amoxicillin is the drug of choice.



[Q: 3992] OnExamination 2012 - Infectious disease

A 70-year-old woman developed herpes zoster ophthalmicus.

Which one of the following is most likely to be a complication of this condition?

- 1- Hyphaema
- 2- Keratitis
- 3- Keratoconus
- 4- Posterior subcapsular cataract
- 5- Scleromalacia

Answer & Comments

Answer: 2- Keratitis

Keratitis due to varicella zoster virus (VZV) may subsequently lead to iridocyclitis and secondary glaucoma.



[Q: 3993] OnExamination 2012 - Infectious disease

Of which of the following is chronic liver disease not a complication?

- 1- Alpha1 antitrypsin deficiency
- 2- Cystic fibrosis
- 3- Haemochromatosis
- 4- Haemosiderosis
- 5- Hepatitis C

Answer & Comments

Answer: 4- Haemosiderosis

Fifty percent of hepatitis C infections lead to chronic liver disease (treat with interferon-a).

Liver disease from chronic cholestasis occurs in cystic fibrosis.

Alpha1 antitrypsin deficiency causes both cirrhosis and emphysema.

Haemochromatosis is autosomal recessive and is characterised by excessive iron deposition in various organs causing organ failure (diabetes, heart failure, chronic liver disease, hypogonadism, skin pigmentation and arthritis).

Haemosiderosis usually arises due to parenteral iron overload, for example, in patients with aplastic anaemia after multiple transfusions. It is not commonly associated with cirrhosis.

If cirrhosis does develop as a result of massive iron overload the condition is known as secondary haemochromatosis.



[Q: 3994] OnExamination 2012 - Infectious disease

A sexually active female presents to a GU

clinic with multiple painful genital ulcers.

What is the likeliest cause?

- 1- Chlamydia trachomatis
- 2- Herpes simplex
- 3- Haemophilus ducreyi
- 4- Primary HIV infection
- 5- Treponema pallidum

Answer & Comments

Answer: 2- Herpes simplex

Herpes simplex is a sexually transmitted disease and the commonest cause of multiple painful genital lesions.

C. trachomatis and T. pallidum do not normally cause painful genital ulceration.

H. ducreyi does cause painful genital ulcers, however there is usually only a single ulcer present and it is much less common than Herpes simplex in the UK. It remains highly prevalent in areas of Africa.

Compared to herpes simplex, primary human immunodeficiency virus (HIV) infection is an unusual cause of genital ulceration.



[Q: 3995] OnExamination 2012 - Infectious disease

A 27-year-old man comes to the Emergency department with his partner at 5 am. He has developed torrential diarrhoea a few hours after eating a Chinese takeaway with fried rice. Apparently he bought the meal at the beginning of the evening when he thought it would be most fresh.

On examination he is dehydrated with a BP of 110/70 mmHg, a pulse of 90 and a significant postural drop.

Investigations show:

Haemoglobin 15.0 g/dl (13.5-17.7)

White cell count $6.6 \times 10^9/L$ (4-11)

Platelets $292 \times 10^9/L$ (150-400)

Serum Sodium 142 mmol/l (135-146)

Serum Potassium 3.7 mmol/l (3.5-5)

Creatinine 122 μ mol/l (79-118)

Which of the following is the most likely cause of his gastroenteritis?

- 1- Bacillus cereus
- 2- Norovirus
- 3- Rotavirus
- 4- Staphylococcus aureus
- 5- Staphylococcus typhi

Answer & Comments

Answer: 1- Bacillus cereus

Bacillus cereus food poisoning occurs around six to eight hours after ingestion of reheated rice. Two distinct forms occur, one related to a toxin which leads to profuse vomiting, the other which leads to torrential diarrhoea.

It is likely the takeaway restaurant reheated rice that was left over from the previous evening.

The condition is self-limiting and usually resolves within 24 hours. No specific intervention is required, and this patient should just be given oral rehydration salts.



[Q: 3996] OnExamination 2012 - Infectious disease

A 67-year-old man is referred with symptoms of fatigue and a low grade fever. He has lost a few pounds in weight over the past few weeks and suffered from persistent night sweats.

Past history of note includes chronic gum disease and a number of broken teeth. He is also allergic to penicillin.

On examination he has a temperature of 37.8°C, and his BP is 105/70 mmHg with a pulse of 95. There are splinter haemorrhages on examination of the fingers on both hands.

He has a systolic murmur loudest in the mitral area.

Investigations show

Haemoglobin 10.8 g/dl (13.5-18)

White cell count $11.1 \times 10^9/L$ (4-10)

Platelets $201 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (134-143)

Potassium 4.5 mmol/l (3.5-5)

Creatinine 135 μ mol/l (60-120)

C reactive protein 125 mg/l (<10)

Which of the following is the most appropriate empirical antibiotic regime?

- 1- Benzylpenicillin and gentamicin
- 2- Ceftazidime and metronidazole
- 3- Flucloxacillin and gentamicin
- 4- Linezolid and gentamicin
- 5- Vancomycin and gentamicin

Answer & Comments

Answer: 5- Vancomycin and gentamicin

Viridans or Bovis streptococci would figure very high on the index of suspicion, as causes of endocarditis here. As such, in the presence of penicillin allergy, guidelines from the Royal College recommend vancomycin and gentamicin combination therapy as the best alternative to benzylpenicillin and gentamicin.

Flucloxacillin and gentamicin is the regime of choice for methicillin sensitive Staphylococcus aureus, with linezolid an appropriate alternative in MRSA.



[Q: 3997] OnExamination 2012 - Infectious disease

Which one of the following antiretrovirals is likely to cause increased pigmentation of the skin in a black African patient?

- 1- Didanosine
- 2- Efavirenz

- 3- Emtricitabine
- 4- Nevirapine
- 5- Stavudine

Answer & Comments

Answer: 3- Emtricitabine

Emtricitabine causes hyperpigmentation of skin including palmar creases in 8% of black patients.

Didanosine and stavudine cause mitochondrial toxicity, hence peripheral neuropathy, pancreatitis and hyperlactataemia.

Efavirenz causes CNS toxicity.

Nevirapine causes acute hepatitis and skin rash.



[Q: 3998] OnExamination 2012 - Infectious disease

A 45-year-old HIV-seropositive man attended the outpatient clinic for the results of a fasting serum lipid test.

He had been diagnosed with HIV disease two years previously and was started on highly active antiretroviral therapy. One year after commencing antiretrovirals, his CD4 count had risen from 10 cells/ mm³ to 120 cells/ mm³ with an undetectable viral load.

His current medications consisted of zidovudine, lamivudine, lopinavir, aciclovir, fluconazole and co-trimoxazole.

Fasting lipid profile revealed:

Serum cholesterol 4.1 mmol/l (<5.2)

Serum triglyceride 18.2 mmol/l (0.45-1.69)

Which of the following medications is most likely to be responsible for these results?

- 1- Co-trimoxazole
- 2- Fluconazole
- 3- Lamivudine
- 4- Lopinavir

- 5- Zidovudine

Answer & Comments

Answer: 4- Lopinavir

Lipodystrophy, lipoatrophy and alterations in serum lipid values have been observed in patients with human immunodeficiency virus (HIV) disease taking highly active antiretroviral therapy.

Elevated serum lipid levels have been associated with premature coronary artery disease.

Hypertriglyceridaemia is also thought to contribute to central fat deposition, and insulin resistance that is also seen in these patients.

Abnormalities of serum lipid levels are likely to be multifactorial in patients with HIV disease, but appear much commoner in patients taking protease inhibitors.

Isolated hypertriglyceridaemia can occur in HIV disease in the absence of protease inhibitors, but extremely high serum triglycerides have been documented in some patients treated with these drugs.

If the elevation in lipid levels is modest, measures such as dietary modification and exercise may be tried first. Omega-3 fish oils may also be beneficial in reducing modestly-elevated serum triglycerides.

In refractory cases, or where there is extreme isolated hypertriglyceridaemia, a fibrate should be used.

In addition, patients with HIV disease may also have elevated serum lipid levels due to familial hyperlipidaemia.



[Q: 3999] OnExamination 2012 - Infectious disease

A 15-year-old female is a close contact of a student who has developed meningitis C. The

last contact she had with her friend was two days ago when her friend developed headache.

She has not received any previous vaccination for meningitis.

What is the most appropriate action for this girl?

- 1- No treatment is required and the girl can be reassured
- 2- She should receive the meningococcal A and C vaccination only
- 3- She should receive the meningococcal A and C vaccination plus rifampicin
- 4- She should receive meningococcal immunoglobulin only
- 5- Treat with rifampicin only

Answer & Comments

Answer: 3- She should receive the meningococcal A and C vaccination plus rifampicin

This girl runs a reasonably high risk of developing meningitis and should receive meningitis C vaccination together with rifampicin.

Antibiotics used for chemoprophylaxis are rifampicin, minocycline, spiramycin, ciprofloxacin and ceftriaxone. More here

Guidelines and Advice - Meningococcal



[Q: 4000] OnExamination 2012 - Infectious disease

A 17-year-old male presented with a widespread maculopapular rash. He had been prescribed amoxicillin for exudative tonsillitis.

What is the most likely diagnosis?

- 1- Acute HIV infection
- 2- Cytomegalovirus infection
- 3- Infectious mononucleosis
- 4- Parvovirus infection

5- Streptococcal infection

Answer & Comments

Answer: 3- Infectious mononucleosis

This patient has the typical features of glandular fever and this is confirmed by the typical rash following the introduction of amoxicillin.

This rash is considered almost pathognomonic of glandular fever and will subside following withdrawal of amoxicillin.

There are no other features in this patient's history to suggest an alternative diagnosis.



[Q: 4001] OnExamination 2012 - Infectious disease

A 25-year-old, previously healthy, woman has worsening fatigue with dyspnoea, palpitations, and fever over the past one week.

Her vital signs on admission to the hospital show temperature 38.9°C, respiratory rate 30/min, pulse 105 bpm and BP 95/65 mmHg. Her heart rate is irregular.

An ECG shows diffuse ST-T segment changes. A chest x ray shows mild cardiomegaly. An echocardiogram shows slight mitral and tricuspid regurgitation, but no valvular vegetations. Her troponin I is 12 ng/mL (<0.04).

She recovers over the next two weeks with no apparent sequelae.

Which of the following laboratory test findings best explains the underlying aetiology for these events?

- 1- ANCA titre of 1:80
- 2- Anti-streptolysin O titre of 1:512
- 3- Blood culture positive for streptococcus, viridans group
- 4- Coxsackie B serologic titre of 1:160
- 5- Total serum cholesterol of 9.6 mmol/l

Answer & Comments

Answer: 4- Cocksackie B serologic titre of 1:160

She has findings that suggest myocarditis, and this is supported by the temperature, echo findings and markedly raised troponin.

Myocarditis can have features similar to cardiomyopathy and the mild valvular disease is quite compatible.

One of the most likely organisms is Cocksackie B virus.



[Q: 4002] OnExamination 2012 - Infectious disease

A patient is planning to travel through the southern states of America but is worried about West Nile virus.

Which of the following statements regarding West Nile virus is correct?

- 1- Infection is non-fatal
- 2- Is a member of the arbovirus family
- 3- May be associated with poliomyelitis-like paralysis
- 4- Transplacental transmission does not occur
- 5- Treatment with interferon is effective in West Nile virus encephalitis

Answer & Comments

Answer: 3- May be associated with poliomyelitis-like paralysis

West Nile virus is a Flavivirus of the Japanese encephalitis family. It is thought it is spread when a mosquito bites an infected bird and then bites a human. Few of those bitten develop symptoms and even fewer progress to severe disease.

West Nile virus can be spread via vertical transmission as well as blood transfusions and organ transplant.

If infected with the virus, there are generally three different outcomes:

Asymptomatic (estimated 90%)

A mild febrile syndrome known as West Nile fever or rarely

Neuro-invasive disease termed West Nile meningitis or encephalitis.

West Nile fever can present with several vague 'generally unwell' symptoms that tend to last three to six days such as:

Abdominal pain

Diarrhoea

Fever

Headache

Arthralgia

Nausea and vomiting

Rash

Sore throat

Lymphadenopathy.

The following symptoms are suggestive of West Nile encephalitis/meningitis and prompt medical attention is required:

Extrapyramidal signs:

Confusion and seizures

Loss of consciousness or coma

Muscle weakness

Stiff neck

Weakness of one arm or leg (a poliomyelitis-like paralysis).

Diagnosis can be via blood or cerebral spinal fluid serology for West Nile antibodies. More rapid techniques using polymerase chain reaction may be used.

Due to the viral nature of the infection the current best treatment is supportive. In general it has an excellent prognosis. For those rare cases with severe infection it may lead to brain damage and death.

Approximately 10% of patients with brain inflammation do not survive.

In 2003 there were 276 deaths attributed to West Nile virus.

Interestingly, West Nile Virus is endemic in the avian population. The deaths of large numbers of birds in an area may thus herald an imminent epidemic of West Nile virus.



[Q: 4003] OnExamination 2012 -
Neurology

A 27-year-old woman is suffering with headaches that have occurred daily for the past three months.

They occur at different times of the day and affect the frontal and occipital areas. She has no neck stiffness or rash. She does not have any visual symptoms.

She has noticed cramps and tingling in her lips and fingers associated with palpitations and a feeling of suffocation. She takes no medication.

She is concerned because her father died from glioblastoma 12 months ago.

What is the likely cause of her headaches?

- 1- Anxiety neurosis
- 2- Benign intracranial hypertension
- 3- Glioblastoma
- 4- Nelson's syndrome
- 5- Neurosarcoidosis

Answer & Comments

Answer: 1- Anxiety neurosis

This lady's symptoms fit with an anxiety neurosis. She has symptoms of anxiety, headache, hyperventilation (tetany and tingling) and palpitations, related to the stressor of her father's death. There are no 'red flags' which would warrant further investigations.

Benign intracranial hypertension (BIH) and glioblastoma would give her a tendency to produce a headache that worsens with coughing or sneezing and might be associated with visual symptoms.

Neurosarcoidosis can present with nerve palsies, deficiencies of the pituitary function or character changes/psychosis, but this presentation would be extremely atypical.

Nelson's syndrome occurs following bilateral adrenalectomy for Cushing's syndrome in patients who have an adrenocorticotrophic hormone secreting pituitary adenoma. Pre-operatively the patients have high cortisol levels, which reduce following adrenalectomy. This causes an increased production of corticotropin-releasing hormone, which can result in unchecked growth of the pituitary adenoma. In turn this causes pressure on surrounding structures and the secondary loss of other pituitary hormones - a combination termed Nelson's syndrome.



[Q: 4004] OnExamination 2012 -
Neurology

A 67-year-old man is referred as an emergency by his general practitioner.

The night before he attempted to smother his wife whilst he was fast asleep. The following day, whilst oblivious to the potentially dangerous situation, he reports remembering dreaming about fighting a bear. His father had experienced a similar event some years before being diagnosed with Parkinson's disease.

Which of the following is the most likely diagnosis?

- 1- Adult attention deficit hyperactivity disorder (ADHD)
- 2- Lewy body dementia
- 3- Night terrors
- 4- REM sleep behaviour disorder
- 5- Schizophrenia

Answer & Comments

Answer: 4- REM sleep behaviour disorder

Rapid eye movement (REM) sleep behaviour disorder, is a parasomnia manifested by vivid dreams associated with simple or complex motor behaviour during REM sleep. Polysomnography demonstrates increased

electromyographic tone and dream enactment. often associated with the violent re-enacting of dreams, occurs when the normal atonicity of REM sleep is lost.

There is an association with the later development of movement disorders and these can be predicted by a number of years. Parkinson's disease is increasingly linked with REM sleep behaviour disorder.

Making the situation safe is paramount but treatment with clonazepam is the intervention of choice. Counselling can also play a role.



[Q: 4005] OnExamination 2012 - Neurology

A 33-year-old woman with epilepsy presents with visual problems.

Examination reveals a constriction of visual fields to confrontation.

Which of the following may be responsible for her visual deterioration?

- 1- Gabapentin
- 2- Lamotrigine
- 3- Phenytoin
- 4- Sodium valproate
- 5- Vigabatrin

Answer & Comments

Answer: 5- Vigabatrin

Vigabatrin is associated with constricted visual fields and when detected therapy should be stopped.



[Q: 4006] OnExamination 2012 - Neurology

A 32-year-old woman presents with a left sided postural tremor, a shuffling gait, dysarthric speech, ataxia and difficulty swallowing.

Which is the most important initial test?

- 1- Caeruloplasmin levels
- 2- CT head scan
- 3- Dopamine levels
- 4- Genetic testing
- 5- Serum copper

Answer & Comments

Answer: 1- Caeruloplasmin levels

Wilson's disease is an autosomal recessive disease linked to the q14-21 region on chromosome 13.

It is associated with impaired biliary excretion of copper, and impaired incorporation of copper into caeruloplasmin, resulting in copper overloading of the brain and liver.

Common symptoms are:

Parkinsonism

Bulbar signs

Postural tremor

Movement disorders and

Ataxia, as well as

Psychiatric symptoms and

Liver failure.

The most useful screening test is plasma caeruloplasmin, with levels less than 20 mg/dL suggestive.

With regard to the options:

Caeruloplasmin levels is correct as it is the most appropriate screening test for Wilson's disease.

CT head scan is incorrect as it will often be normal.

Dopamine levels is incorrect as dopamine levels do not help the diagnosis.

Genetic testing is incorrect as it is not an initial test.

Serum copper is incorrect as serum copper levels may be normal (urinary copper normally high).



[Q: 4007] OnExamination 2012 - Neurology

A 60-year-old man presents with mobility problems.

On examination he has Lhermitte's phenomenon, is Romberg's positive, and has a wide-based gait that deteriorates on eye closure, absent ankle jerks and extensor plantars. He takes thyroxine for an underactive thyroid, no other medical problems.

He is concerned as he had an uncle who developed unsteadiness and ended up in a wheelchair.

Which of the following is the likely diagnosis?

- 1- Cervical spondylosis
- 2- Friedreich's ataxia
- 3- Multiple sclerosis
- 4- Subacute combined degeneration of the cord.
- 5- Under-replacement of thyroxine

Answer & Comments

Answer: 4- Subacute combined degeneration of the cord.

Subacute combined degeneration of the cord is secondary to B12 deficiency.

B12 deficiency is usually caused by pernicious anaemia, this may be associated with other autoimmune conditions.

Lhermitte's phenomenon is typically present in multiple sclerosis, but may also occur in sub-acute combined degeneration of the cord.

This man's gait disturbance and positive Romberg's sign point towards dorsal column damage.

Causes of absent ankle jerks and extensor plantars include B12 deficiency, HIV, spinal AVM, taboparesis, Friedreich's ataxia and cervical and lumbar spondylosis.

The family history is a red herring. His uncle may well have had Friedreich's ataxia, however, this usually presents by the age of 30.

A. Cervical spondylosis is not the correct answer. This can cause Lhermitte's phenomenon. Only if both cervical and lumbar spondylosis are present can spondylosis cause absent ankle jerks and extensor plantars.

B. Friedreich's ataxia is not the correct answer. This may be associated with absent ankle jerks and extensor plantars but usually presents by age 30.

C. Multiple sclerosis is not the answer. This can cause Lhermitte's phenomenon and extensor plantars but could not account for the lower motor neurone signs.

D. Subacute combined degeneration of the cord is the correct answer.

E. Under-replacement of thyroxine is not the correct answer. Hypothyroidism can cause ataxia but would not account for the other symptoms.



[Q: 4008] OnExamination 2012 - Neurology

To difficulty in which of the following does optic ataxia refer?

- 1- Controlling hand-eye coordination
- 2- Moving the eyes
- 3- Seeing colours
- 4- Seeing objects
- 5- Shifting gaze

Answer & Comments

Answer: 1- Controlling hand-eye coordination

Shifting gaze is the problem of optic apraxia.

Both optic ataxia and optic apraxia together with simultagnosia are referred to as Balint's syndrome.

Difficulty seeing colours is achromatopsia.

Seeing objects can be due to retinal or occipital lesions, or parietal if certain objects such as faces cannot be identified.



[Q: 4009] OnExamination 2012 - Neurology

Cerebral malaria is caused by which of the following?

- 1- Plasmodium knowlesi
- 2- Plasmodium falciparum
- 3- Plasmodium malariae
- 4- Plasmodium vivax
- 5- Plasmodium yoelii

Answer & Comments

Answer: 2- Plasmodium falciparum

Of the Plasmodium species, only Plasmodium falciparum invades the central nervous system, causing cerebral malaria.

The neuropathology of cerebral malaria consists of diffuse cerebral swelling, widespread small-ring haemorrhages located in the subcortical white matter of the cerebral hemispheres, and plugging of cerebral capillaries and venules by parasitised erythrocytes; pigmentation with haemozoin is quite typical.

Focal neurologic deficits are relatively uncommon in cerebral malaria and are usually caused by a cerebral infarct due to arterial thrombosis occurring during the acute phase of the disease.



[Q: 4010] OnExamination 2012 - Neurology

A 72-year-old man comes to the neurology clinic with his wife. He is driving her mad as almost every night when he tries to go to bed he feels that something is crawling over his legs and he has an irresistible urge to scratch, rub or move them, and eventually has to get up and pace around the room.

He has no significant past medical history, apart from essential hypertension for which he takes ramipril 10 mg per day.

On examination his blood pressure is 139/73 mmHg, his pulse is 70 and regular and he has no murmurs. Respiratory, abdominal and neurological examinations are entirely normal.

Investigations show:

Haemoglobin 11.8 g/dl (13.5-17.7)

White cells $4.9 \times 10^9/L$ (4-11)

Platelets $230 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 4.4 mmol/l (3.5-5)

Creatinine 122 $\mu\text{mol/l}$ (79-118)

Glucose 4.9 mmol/l (<5.5)

Which of the following is the most appropriate treatment?

- 1- Baclofen
- 2- L-dopa
- 3- Oxycodone
- 4- Ropinirole
- 5- Sodium valproate

Answer & Comments

Answer: 4- Ropinirole

This patient's history is typical for restless legs syndrome.

Dopamine agonists such as ropinirole are the treatment of choice, with anti-convulsants

such as sodium valproate being effective second line agents. Whilst opiates may be used, they are generally avoided due to long term tolerance.

Secondary restless legs syndrome may be seen in those with:

Diabetes mellitus

Anaemia

Chronic renal failure.

Symptoms can improve with correction of anaemia or control of blood sugar.

The associated sleep disturbance can have a significant negative effect on the quality of life.



[Q: 4011] OnExamination 2012 - Neurology

A 29-year-old woman comes to the clinic because she is concerned that her left pupil is abnormally large. Her boyfriend noticed it and suggested she should see the doctor.

She has no past medical history of note, apart from an episode of shingles a few months earlier, and takes the oral contraceptive pill as her only medication. On further questioning she admits to unprotected sexual intercourse on two to three occasions over the past three to four years.

On examination her left pupil is clearly larger than the right. It hardly reacts to light at all, but does accommodate to near vision. You notice that re-dilatation is very slow however. Her BP is normal at 132/72 mmHg, and general physical examination is unremarkable.

How best can you confirm the diagnosis?

- 1- Chest x ray
- 2- Lumbar puncture
- 3- MRI brain
- 4- Reaction to weak miotic eye drops

5- Syphilis serology

Answer & Comments

Answer: 4- Reaction to weak miotic eye drops

This history is typical of an Adie's tonic pupil, which is characteristically seen in young women, and may occur after an episode of zoster infection.

At the beginning of the condition the pupil is large, but over time becomes small and poorly reactive. Slit lamp examination may reveal small worm like contractions of the iris, but the usual diagnostic test is to use weak pilocarpine eye drops, which induce vigorous pupil contraction on the affected side, but only weak contraction of the pupil on the unaffected side.

In adults it tends to be a benign condition and is simply observed, however infants are usually referred because of an association with familial dystonias.



[Q: 4012] OnExamination 2012 - Neurology

A 56-year-old male with diabetes presents with a two day history of weakness of the left foot being aware of a feeling of dragging the toes along the floor when walking.

He has been diabetic for two years and on previous annual review no abnormalities were noted.

On examination he is unable to dorsiflex his left foot together with eversion of the foot. The right foot is unaffected. Plantar flexion and inversion are normal.

Which sensory abnormality would you expect to find in association with this motor defect?

- 1- No associated sensory loss
- 2- Sensory loss over the big toe
- 3- Sensory loss over the entire foot to the ankle.

- 4- Sensory loss over the lateral part of the leg and dorsum of the foot
- 5- Sensory loss over the plantar aspect of the foot

Answer & Comments

Answer: 4- Sensory loss over the lateral part of the leg and dorsum of the foot

This male with diabetes appears to have developed a mononeuropathy with the features compatible with a common peroneal nerve neuropathy. This would result in a loss of sensation over the dorsum of the foot and lateral part of the leg with sparing of the fifth toe.

Although you could argue that a peripheral neuropathy might be expected in this diabetic, the question specifically asks what defect would you expect to find with this neuropathy.

Also previously normal findings would argue against a sudden peripheral neuropathy.



[Q: 4013] OnExamination 2012 - Neurology

A 20-year-old female presents with seizures.

She is fit and healthy but had been unwell for three days prior to admission with flu-like symptoms.

The patient's friends tell you that prior to the seizure she had become confused and her behaviour had been out of character.

On examination the patient is post-ictal, with a fever of 39.1°C. She has a pulse of 100 bpm and a blood pressure of 130/71 mmHg. A CT head shows no abnormalities.

CSF examination shows no organisms, with a white cell count of 353/ mm³ (<5) mostly lymphocytes with a protein concentration of 2.3 g/l (0.29-1.98) and glucose of 3.2 mmol/l (3.0-6.0mmol/l).

What is the likely diagnosis?

- 1- Epilepsy
- 2- Herpes simplex encephalitis
- 3- Meningococcal meningitis
- 4- Pneumococcal meningitis
- 5- Viral meningitis

Answer & Comments

Answer: 2- Herpes simplex encephalitis

Herpes simplex encephalitis presents with:

Behavioural changes or psychiatric disturbance

Focal seizures

Fever and

Alteration in consciousness.

It has peaks of presentation in the young and old.

A computerised tomography (CT) scan of the brain may be normal, but a magnetic resonance imaging (MRI) may reveal the diagnosis.

Cerebrospinal fluid (CSF) shows a pleomorphic monocytois with raised protein, sometimes elevated red cells and a normal or low glucose.

A high index of suspicion should give you the diagnosis, and if in doubt, intravenous aciclovir will protect the patient whilst other avenues are being explored.



[Q: 4014] OnExamination 2012 - Neurology

A 69-year-old male presents with sudden onset weakness of his legs associated with urinary retention. Five years previously he was diagnosed with sigmoid colonic carcinoma which was surgically resected.

Examination revealed a flaccid paraparesis of the legs with absent tendon reflexes and plantar responses. Pinprick and temperature

sensations were absent to T12 level, but there was a relative sparing of light touch and joint position sensation.

What is the most likely diagnosis?

- 1- Anterior spinal artery occlusion
- 2- Intramedullary spinal cord metastasis
- 3- Spinal cord compression due to vertebral metastasis
- 4- T11/12 central disc prolapse
- 5- Transverse myelitis

Answer & Comments

Answer: 1- Anterior spinal artery occlusion

The lesion is involving the anterior two thirds of the spinal cord which spares light touch, vibration and position sense, but causes loss of pain and temperature sensation distally.

The diagnostic possibilities therefore include anterior spinal artery occlusion, which is rare, and intramedullary spinal cord metastasis.

The condition has developed quite suddenly, which is the key and supports a vascular event.

Intramedullary spinal cord lesions are also rare, and vertebral metastasis causing cord compression occurs more commonly; however the clinical signs suggest sparing of the dorsal columns.



[Q: 4015] OnExamination 2012 - Neurology

A 54-year-old male presents with progressive pins and needles and numbness in both feet which have deteriorated over the last six months.

He has a 10 year history of type 2 diabetes mellitus and had cervical spondylosis for which he underwent surgery eight years ago. He also confessed to drinking approximately 40 units of alcohol weekly.

On examination he had a mild bilateral weakness of foot dorsiflexion, both ankle reflexes were absent and plantar responses were flexor. There was absent sensation to light touch to mid-shin level with loss of joint position sensation in the toes and absent vibration sensation below the hips. He had a marked sensory ataxia and pseudoathetosis of upper limbs. He had no evidence of a retinopathy and urinalysis was normal.

What is the most likely diagnosis?

- 1- Alcohol-induced neuropathy
- 2- Central lumbar disc prolapse
- 3- Cervical cord compression
- 4- Diabetic peripheral neuropathy
- 5- Vitamin B₁₂ deficiency

Answer & Comments

Answer: 5- Vitamin B₁₂ deficiency

Diabetic peripheral neuropathy usually goes in parallel with retinopathy and nephropathy.

It is also slowly progressive and affects mainly the spinothalamic pathway.

Alcohol induced peripheral neuropathy is also slowly progressive and affects mainly spinothalamic pathway.

Vitamin B₁₂ deficiency usually causes a more rapidly progressive neuropathy with dorsal column involvement (joint position and vibration involvement with sensory ataxia and pseudoathetosis of upper limbs).



[Q: 4016] OnExamination 2012 - Neurology

A 16-year-old girl is noted to have persistent polyuria in excess of 4 litres per day whilst recovering from a head injury she sustained in a road traffic accident.

Investigations reveal:

Potassium 4.1 mmol/L (3.5-4.9)

Calcium 2.4 mmol/L (2.2-2.6)

Glucose 5.6 mmol/L (3.0-6.0)

Which one of the following is the most effective method of confirming the diagnosis?

- 1- Autoantibodies to vasopressin neurones
- 2- MRI of the hypothalamus and pituitary
- 3- Therapeutic trial of low dose DDAVP
- 4- Vasopressin concentration
- 5- Water deprivation test

Answer & Comments

Answer: 5- Water deprivation test

The history and confirmed polyuria are suspicious of diabetes insipidus (DI) which is not uncommon after head injury.

This can be confirmed with a water deprivation test where failure of urine concentration would be expected.

An MRI of the pituitary and hypothalamus may show no abnormality but would be undertaken after the diagnosis of DI is confirmed.

Similarly anterior hormone assessment would also be undertaken after the diagnosis is confirmed.

A therapeutic trial of DDAVP is only appropriate if the diagnosis of DI is confirmed as primary polydipsia can also be a feature of trauma and in these circumstances DDAVP may precipitate hyponatraemia.

Autoantibodies to antidiuretic hormone (ADH) neurones are irrelevant.



[Q: 4017] OnExamination 2012 - Neurology

A 38-year-old woman is referred to the casualty department with bilateral weakness in her legs. She also complains of general malaise.

Three weeks previously she had returned from a four week tour of Eastern Europe.

On examination she appeared unwell and was pyrexial (38.9°C). She had large palpable cervical lymph nodes bilaterally. Her pharynx was inflamed with areas of exudate on the pharyngeal wall.

Neurological examination revealed global weakness of both legs and absent reflexes.

What is the most likely diagnosis?

- 1- Cytomegalovirus infection
- 2- Diphtheria
- 3- Epstein-Barr virus infection
- 4- Hodgkin's disease
- 5- Streptococcal tonsillitis

Answer & Comments

Answer: 2- Diphtheria

The breakdown of healthcare services in the former USSR was associated with a major resurgence of diphtheria.

Pharyngeal diphtheria presents with:

Fever

Sore throat

Cervical lymphadenopathy and

An adherent, grayish pharyngeal membrane.

The diphtheria toxin causes cardio- and neurotoxicity.

Treatment consists of antibiotic therapy and diphtheria antitoxin.



[Q: 4018] OnExamination 2012 - Neurology

A 30-year-old female presents with weight gain, some hair loss and a tremor six months after commencing single drug treatment.

Which one of the following drugs is most likely to be responsible for her symptoms?

- 1- Carbamazepine
- 2- Lamotrigine
- 3- Phenytoin
- 4- Sodium valproate
- 5- Topiramate

Answer & Comments

Answer: 4- Sodium valproate

Sodium valproate is associated with:

Weight gain

Tremor

Hair loss

Teratogenicity

Polycystic ovary disease.

Lamotrigine is associated with skin rash (and Stevens-Johnson syndrome in severe cases).

Topiramate is associated with:

Renal stones

Weight loss

Cognitive impairment

Tingling in extremities.

Phenytoin is associated with:

Peripheral neuropathy

Cerebellum syndrome

Acne

Hirsutism

Gingival hypertrophy

Hypocalcaemia.



[Q: 4019] OnExamination 2012 - Neurology

A 50-year-old woman is referred with a two week history of difficulty walking and weakness in her arms.

On examination, there was proximal and distal limb weakness which was more marked in the legs than the arms. All tendon reflexes were absent and the plantar responses were flexor. There was no sensory loss.

Blood pressure in the supine position was 140/78 mmHg (lying) and was 110/70 mmHg on standing.

What is the most likely diagnosis?

- 1- Cervical cord compression
- 2- Guillain-Barré syndrome
- 3- Myasthenia gravis
- 4- Poliomyelitis
- 5- Polymyositis

Answer & Comments

Answer: 2- Guillain-Barré syndrome

This is a classical presentation of Guillain-Barre with the gradual development of ascending weakness with autonomic involvement.



[Q: 4020] OnExamination 2012 - Neurology

A 70-year-old woman presented with a relatively short history of headaches and episodic impairment of consciousness.

What is the most likely cause?

- 1- Alzheimer-type dementia
- 2- Chronic subdural haematoma
- 3- Creutzfeldt-Jakob disease
- 4- Depressive stupor
- 5- Normal pressure hydrocephalus

Answer & Comments

Answer: 2- Chronic subdural haematoma

This is the classical presentation of subdural haematoma.

Headache, drowsiness and confusion are common and often fluctuate.

Both dementia and depressive stupor (immobile, mute, unresponsive but fully conscious) are not associated with impaired consciousness.

Normal pressure hydrocephalus is characterised by dementia, apraxia and urinary incontinence.



[Q: 4021] OnExamination 2012 - Neurology

Which of the following features is characteristic of myasthenia gravis?

- 1- Diplopia
- 2- Equal sex incidence
- 3- Fasciculation
- 4- Lid lag
- 5- Loss of pupillary reflexes

Answer & Comments

Answer: 1- Diplopia

Myasthenia gravis is more common in females (it is an autoimmune disease).

The most common features include ptosis, diplopia and ophthalmoplegia.

It is a neuromuscular disorder and therefore does not cause any lower motor neuron signs such as fasciculations, wasting, and loss of reflexes.

Pupils are always normal.

Lid lag is a feature of thyroid eye disease.



[Q: 4022] OnExamination 2012 - Neurology

By which of the following is a demyelinating polyneuropathy typically caused?

- 1- Diabetes
- 2- Excessive alcohol

- 3- Hereditary motor sensory neuropathy
- 4- Renal failure
- 5- Vitamin B₁₂ deficiency

Answer & Comments

Answer: 3- Hereditary motor sensory neuropathy

The differential diagnosis of demyelinating neuropathy includes:

Hereditary motor sensory neuropathy (Charcot-Marie-Tooth disease)

Refsum's disease

Guillain-Barre syndrome

Chronic inflammatory demyelinating polyneuropathy (CIDP)

Paraprotein-related disorder

Leukodystrophies.

An axonal polyneuropathy may be caused by:

Amiodarone

Diabetes

Alcohol

Vitamin deficiencies

Renal failure.



[Q: 4023] OnExamination 2012 - Neurology

A 17-year-old male has been diagnosed with schizophrenia four weeks ago.

He was started on haloperidol. Two weeks later he was found confused and drowsy.

On examination he was pyrexial (40.7°C), rigid with blood pressure of 200/100 mmHg.

Which of the following treatments will you initiate?

- 1- Aciclovir
- 2- Cefuroxime

- 3- Dantrolene
- 4- Diazepam
- 5- Phenytoin

Answer & Comments

Answer: 3- Dantrolene

Neuroleptic malignant syndrome is the most likely diagnosis.

Its major features are:

Rigidity

Altered mental state

Autonomic dysfunction

Fever and

High creatinine kinase.

It is usually caused by potent neuroleptics.

The treatments of choice are dantrolene and bromocriptine.

Withdrawal of neuroleptic treatment is mandatory.

Rhabdomyolysis and acute renal failure are potential complications.



[Q: 4024] OnExamination 2012 - Neurology

A 40-year-old man presents with a two year history of intermittent strictly unilateral headaches.

The pain is excruciatingly severe. It is located around the orbital region. The headache usually lasts 45-60 minutes. It usually occurs in the early hours of the morning.

There is associated ptosis and lacrimation on the side of the headache.

Which of the following is the most likely diagnosis?

- 1- Cluster headaches
- 2- Giant cell arteritis

- 3- Migraine
- 4- Tension type headache
- 5- Trigeminal neuralgia

Answer & Comments

Answer: 1- Cluster headaches

Cluster headache has three important features:

Trigeminal distribution pain

Ipsilateral cranial autonomic features and

The striking tendency to circadian and circannual periodicity.

It is commoner in men (5:1).

It is associated with:

Lacrimation

Rhinorrhoea

Conjunctival injection

Ptosis and

Miosis.

The common age of onset is the third or fourth decade of life.



[Q: 4025] OnExamination 2012 - Neurology

A 20-year-old female presents with acute onset of left foot drop.

Examination reveals weakness of ankle dorsiflexion and eversion. There is a small area of sensory loss in the first web space. Reflexes were all present and plantar flexor.

Which of the following nerves is likely to be involved?

- 1- Common peroneal nerve
- 2- Femoral nerve
- 3- Inferior gluteal nerve
- 4- Sciatic nerve

5- Tibial nerve

Answer & Comments

Answer: 1- Common peroneal nerve

Peroneal neuropathy usually presents with acute foot drop.

The foot and ankle weakness on neurological examination is restricted to ankle and toe dorsiflexion and ankle eversion.

Ankle reflex (tibial nerve mediated) and knee reflex (femoral nerve mediated) are intact.

Sensory involvement may include the lower two thirds of the lateral leg and dorsum of foot.



[Q: 4026] OnExamination 2012 - Neurology

A 60 year-old male who had been admitted a month ago with a left hemiparesis due to a right thalamic infarction re-presents with painful subluxation of his left shoulder.

Two weeks later he develops severe, constant burning left shoulder pain which radiates down his arm. He found no relief from paracetamol.

Which of the following is most likely to relieve his pain?

- 1- Depo-Medrone injection into the shoulder
- 2- Diclofenac
- 3- Dihydrocodeine
- 4- Gabapentin
- 5- Tramadol

Answer & Comments

Answer: 4- Gabapentin

The description of the pain (burning, radiating) supports the diagnosis of neuropathic pain.

Thalamic infarcts commonly cause late-onset of severe neuropathic pain weeks to months after the stroke. The pain is intractable to analgesics.

The treatment of choice for neuropathic pain is amitriptyline/gabapentin.

There are randomised controlled trials which support their value in neuropathic pain.



[Q: 4027] OnExamination 2012 - Neurology

The incidence of Down's syndrome in children born to women aged less than 30 years is approximately which of the following?

- 1- 1:500
- 2- 1:1000
- 3- 1:5000
- 4- 1:10000
- 5- 1:15000

Answer & Comments

Answer: 2- 1:1000

The incidence is roughly 1 in 1200 births for woman less than 30 and this incidence can rise to 1 in 60 by the age of 42.

Maternal age also affects the incidence of hydrocephalus, anencephaly and other chromosomal disorders.



[Q: 4028] OnExamination 2012 - Neurology

A 71-year-old woman consults you.

She has recently been started on an antihypertensive but she has noticed a dry mouth and dizziness on standing.

Which medication is it likely to be?

- 1- Doxazosin
- 2- Enalapril
- 3- Isosorbide mononitrate

4- Nicardipine

5- Olmesartan medoxomil

Answer & Comments

Answer: 1- Doxazosin

Doxazosin is an alpha-adrenoceptor blocker. It can cause rapid reduction in BP and therefore requires gradual introduction and up-titration. Its side effects include dry mouth, syncope, drowsiness, oedema and gastrointestinal (GI) disturbances.

Enalapril and other angiotensin-converting enzyme (ACE) inhibitors most commonly cause a dry cough and postural hypotension. They can also cause angioedema and hyperkalaemia.

The nitrate class of drugs commonly causes headache and dizziness.

Nicardipine and other calcium channel blockers may cause peripheral oedema, headache, flushing and palpitations.

Olmesartan, an angiotensin 2 blocker has a similar side effect profile to ACEi except usually milder and does not cause a dry cough, as it does not affect bradykinin synthesis.



[Q: 4029] OnExamination 2012 - Neurology

You are called to see a man in the Emergency department who has been in a road traffic accident. His memory of events is poor but he thinks he banged his head. His main complaint now is of extreme pain in his right eye.

On examination he has reduced visual acuity (counting fingers only), proptosis and complete ophthalmoplegia of his right eye. You notice that the eye is injected, chemotic and on closer inspection appears to be pulsating.

Which of the following is the most likely diagnosis?

1- Acute glaucoma

2- Blow-out fracture

3- Carotidocavernous fistula

4- Cavernous sinus thrombosis

5- Retinal haemorrhage

Answer & Comments

Answer: 3- Carotidocavernous fistula

A carotidocavernous fistula is a high pressure shunt of blood between the intracavernous carotid artery and the cavernous sinus.

It is usually traumatic and may occur secondary to open or closed head trauma.

Patients usually complain of pain in the eye.

The most striking sign is pulsatile proptosis. Patients also have palsies of the IIIrd, IVth and Vth nerve palsies, injection and chemosis due to raised episcleral venous pressure. Those who know to listen for it will also hear an orbital bruit.

Regarding the options :

A. Acute glaucoma is not the answer. This causes visual loss and a painful red eye but does not usually follow trauma. It is not associated with ophthalmoplegia, proptosis or visible pulsations.

B. A blow-out fracture is not the answer. This is a fracture of the walls or floor of the orbit. It may cause diplopia in upgaze due to trapping of the eye muscles but would not typically cause the other symptoms.

C. See above.

D. Cavernous sinus thrombosis is not the answer. This may produce ophthalmoplegia and proptosis, does not usually follow trauma and would not cause the pulsations.

E. Retinal haemorrhage is not the answer. This causes painless visual loss but would not cause the other symptoms.



[Q: 4030] OnExamination 2012 - Neurology

A 23-year-old woman presents to the clinic after waking up with difficulty seeing. She reports no past medical history and is currently on no medication.

On examination she has decreased visual acuity of the left eye and red desaturation. She is concerned that she has multiple sclerosis.

You explain that this is not by definition multiple sclerosis.

What is her chance of developing multiple sclerosis?

- 1- 25%
- 2- 33%
- 3- 50%
- 4- 75%
- 5- 100%

Answer & Comments

Answer: 3- 50%

'The cumulative probability of developing MS by 15 years after onset of optic neuritis was 50% (95% confidence interval, 44%-56%) and strongly related to presence of lesions on a baseline non-contrast-enhanced magnetic resonance imaging (MRI) of the brain. Twenty-five percent of patients with no lesions on baseline brain MRI developed MS during follow-up compared with 72% of patients with 1 or more lesions. After 10 years, the risk of developing MS was very low for patients without baseline lesions but remained substantial for those with lesions. Among patients without lesions on MRI, baseline factors associated with a substantially lower risk for MS included male

sex, optic disc swelling, and certain atypical features of optic neuritis'.

Reference:

The Optic Neuritis Study Group

Arch Neurol. 2008;65(6):727-732.



[Q: 4031] OnExamination 2012 - Neurology

A 30-year-old woman presents to the emergency room after an episode of transient left sided weakness lasting 30 minutes.

She reports that she was driving at the time and describes a white zigzag before developing a headache. She then describes a descending numbness and weakness on the left-side of her body. She stopped the car and called an ambulance. On arrival at the hospital her blood pressure was 130/80 mmHg, pulse was regular at 90 beats per minute. She is alert and orientated.

She follows commands, has full strength in her limbs and symmetric reflexes and normal tone. Her cranial nerves are intact and fundoscopy is unremarkable. Visual fields are full on direct confrontation and the eye movements are intact. There is a family history of stroke in her mother, and her sister has migraines. Her past medical history is notable for migraines and hyperthyroidism.

What is the most likely explanation?

- 1- Cerebrovascular accident
- 2- Complicated migraine
- 3- Confusion migraine
- 4- Migraine with aura
- 5- Transient ischemic attack

Answer & Comments

Answer: 2- Complicated migraine

A confusional migraine involves alteration in sensorium rather than limb involvement.

A transient ischemic attack is a possibility however given the history of migraines and

age the most likely diagnosis is complicated migraine.

The presentation does not fit for a stroke.

A migraine with aura does not present with unilateral weakness.



[Q: 4032] OnExamination 2012 - Neurology

A 4-year-old girl presents to the office with her mother. The mother reports that the child is minimally interactive with others.

On examination the child is of short stature. She sits quietly rubbing her hands together and appears disinterested in the visit.

What is the most likely diagnosis?

- 1- Autism spectrum disorder
- 2- Rett syndrome
- 3- Turner's syndrome
- 4- Emery-Dreifuss muscular dystrophy
- 5- Absence seizure

Answer & Comments

Answer: 2- Rett syndrome

A and B. Although similar to autism, Rett syndrome presents with classic hand wringing.

C. Turner's syndrome is an X linked disorder with short stature associated with attention deficit hyperactivity disorder (ADHD) and learning disabilities.

D. Emery-Dreifuss muscular dystrophy affects skeletal and cardiac muscle and presents with progressive weakness.

E. Absence seizures can be associated with automatisms such as lip smacking.



[Q: 4033] OnExamination 2012 - Neurology

A 29-year-old woman who has a history of

epilepsy comes to the clinic complaining of worsening hair loss. She has generalised tonic clonic seizures and has been taking her medication for the past two to three years. Her epilepsy is currently well controlled.

Which of the following medications is she most likely to be taking?

- 1- Carbamazepine
- 2- Gabapentin
- 3- Lamotrigine
- 4- Valproate
- 5- Vigabatrin

Answer & Comments

Answer: 4- Valproate

Up to 12% of patients taking sodium valproate report significant hair loss in clinical trials. Of course, as hair loss is relatively common, other causes of hair loss should be excluded before changing anti-epileptic medication.

Carbamazepine hair loss is recognised, but is only seen in around 6% of patients.

Limited data suggest zinc or selenium supplementation may be associated with reduced hair loss, but these data are somewhat controversial.



[Q: 4034] OnExamination 2012 - Neurology

A 26-year-old female is admitted to ICU with severe asthma.

She is ventilated for one week and receives IV co-amoxiclav/clarithromycin, magnesium, prednisolone, sedatives and muscle relaxants.

She improves gradually but two days after stopping muscle relaxants she still is unable to be weaned from ventilatory support.

On examination, she is alert but has flaccid weakness of all limbs.

Which of the following is the likely diagnosis?

- 1- Critical illness polyneuropathy
- 2- Guillain-Barré syndrome
- 3- Hypermagnesaemia
- 4- Prolonged neuromuscular blockade
- 5- Steroid induced myopathy

Answer & Comments

Answer: 4- Prolonged neuromuscular blockade

The history suggests prolonged neuromuscular junction (NMJ) blockade which may be exacerbated by both corticosteroids and magnesium.

This condition was originally described with suxamethonium due to hereditary reductions in plasma cholinesterase activity.

However, drugs and electrolyte abnormalities may exacerbate this.



[Q: 4035] OnExamination 2012 - Neurology

A 66-year-old male presents with a sudden onset of ataxia, vomiting and headache, followed by increasing drowsiness.

What is the most likely diagnosis?

- 1- Acute cerebellar haemorrhage
- 2- Acute subdural haemorrhage
- 3- Frontal subdural empyema
- 4- Herpes simplex encephalitis
- 5- Pituitary apoplexy

Answer & Comments

Answer: 1- Acute cerebellar haemorrhage

Acute cerebellar infarct or haemorrhage is associated with acute onset of ataxia, headache and vomiting and eventually drowsiness and coma due to the development of obstructing hydrocephalus.

Early computerised tomography (CT) brain scan and close observation are essential in the management of acute cerebellar haemorrhage.



[Q: 4036] OnExamination 2012 - Neurology

A 55-year-old male presents with a history of low back pain and sciatica. The pain radiates to the little toe, the ankle reflex is absent and the patient has difficulty in everting the foot.

Which nerve root is likely to be trapped?

- 1- L3
- 2- L4
- 3- L5
- 4- S1
- 5- S2

Answer & Comments

Answer: 4- S1

The root supply to the peroneal muscles (which control eversion of the foot and which also participate in the reflex arc of the ankle jerk reflex) is S1 via the tibial and superficial peroneal nerves.

The sensory dermatome of the S1 root gives innervation to the postero-lateral aspect of the leg and foot down to and including the little toe and sole of foot.



[Q: 4037] OnExamination 2012 - Neurology

Which of the following statements regarding phenylketonuria is correct?

- 1- Inheritance is X linked recessive
- 2- Is classically due to deficiency of tyrosine hydroxylase
- 3- Mental retardation does not occur if the patient adheres to a phenylalanine free diet

- 4- Serum tyrosine levels are typically low
- 5- Urinary phenylalanine metabolites are typically high

Answer & Comments

Answer: 5- Urinary phenylalanine metabolites are typically high

Phenylketonuria (PKU) is the result of hyperphenylalaninaemia. It is autosomal recessive, with a prevalence of 1:10-20,000 live births.

Phenylalanine is an essential amino acid. Dietary phenylalanine is not utilised for protein synthesis, but is normally degraded via the tyrosine pathway. Failure of this results in other metabolites that cause brain damage.

Deficiency of phenylalanine hydroxylase (chromosome 12) or of the cofactor tetrahydrobiopterin (genes on chromosome 10 and 4) causes accumulation of phenylalanine in body fluids. The affected infant is usually normal at birth, and although blood phenylalanine levels may rise as early as four hours after birth, mental retardation develops gradually, and may not be apparent for a few months.

About 25% of infants have seizures, but over 50% have an abnormal EEG.

Microcephaly, prominent maxilla, growth retardation and wide-spaced teeth are found in untreated children.

Even with dietary treatment some degree of cognitive impairment is seen, and can vary from gross impairment or changes detected on cognitive tests.

Cerebral white matter changes are seen in older patients and may reflect a combination of late diagnosis and dietary indiscretion.

Diagnosis of classic PKU requires raised Phe levels, normal plasma tyrosine levels, increased urinary Phe metabolites and

normal cofactor (tetrahydrobiopterin) concentrations.



[Q: 4038] OnExamination 2012 - Neurology

A 30-year-old lady who suffers from migraine complains that taking the recommended dose of paracetamol during an attack fails to relieve her headache. She has no other significant past medical history. She is a smoker of 15 cigarettes per day and also drinks alcohol 16 units per week.

Which of the following factors most likely explains the lack of efficacy of paracetamol in this lady?

- 1- Bacterial overgrowth
- 2- Delayed gastric emptying
- 3- First pass metabolism
- 4- p450 enzyme induction
- 5- p450 enzyme inhibition

Answer & Comments

Answer: 2- Delayed gastric emptying

'When salicylate absorption from effervescent aspirin tablets was studied during migraine, the rate of absorption was found to be reduced relative to that found in non-migrainous volunteers and in the same patients when headache-free. There is evidence that this reduced rate of absorption is caused by gastrointestinal stasis and reduced rate of gastric emptying. Patients in whom aspirin absorption was delayed were more likely to take longer to respond and to require additional treatment.' Clin Pharmacokinet. 1978 Jul-Aug;3(4):313-8. Metoclopramide may be useful in accelerating gastric emptying.

The same has also been shown with paracetamol absorption.

Br J Clin Pharmacol. 1984 Dec;18(6):867-71



[Q: 4039] OnExamination 2012 -
Neurology

A 40-year-old male presents to casualty with weakness and paraesthesia of the right arm and leg.

The symptoms developed 12 hours after the onset of a piercing left sided headache. There is no neck stiffness, but there is a pain in the left side of the neck and occiput. Kernig's sign is negative. The patient is afebrile, and blood results are normal.

What is the single best investigation of choice?

- 1- Contrast arteriography
- 2- CT head
- 3- Duplex scanning of the neck vessels
- 4- Lumbar puncture
- 5- MRI brain

Answer & Comments

Answer: 1- Contrast arteriography

Ischaemic neurological features (transient or completed strokes) are found in 30-80% of patients presenting with carotid artery dissection.

Pulsatile tinnitus is common, as well as syncope and amaurosis fugax.

Headache is commonly ipsilateral to the side of the carotid dissection, and recurrence of the headache suggests extension or recurrence of the dissection.

As it is the most accurate study and the current gold standard for diagnosis of carotid artery dissection, contrast arteriography should be strongly considered, if there is mono or hemiparesis with normal mental state, signs or history of major cervical trauma with abnormal neurology, or basilar skull fracture in a patient with altered mental status.

Obviously in practice many trusts will require a CT head first. Additionally in the absence of arteriography, duplex scanning or MRI with MRA may be considered the next best tests.

However limitations of duplex scanning include difficulties of scanning the distal internal carotid artery, detecting emboli, and evaluating intracranial arteries.

The combination of MRI and MRA is more reliable in detecting dissection than either modality alone.

Lumbar puncture results may be misleading, as xanthochromia may occur when a haematoma propagates. This rare finding may lead to a misdiagnosis of subarachnoid haemorrhage and failure to perform further carotid workup.



[Q: 4040] OnExamination 2012 -
Neurology

A 47-year-old patient with diabetes is referred from the Emergency department complaining of dizziness and vomiting.

On examination he is alert and orientated, his pulse is 80 irregularly irregular and BP 160/90 mmHg. There is nystagmus on left lateral gaze and his speech is slurred. On examination of the limbs you note intention tremor and past pointing. He is ataxic when mobilised.

What is the likely diagnosis?

- 1- Brainstem infarction.
- 2- Cerebellar CVA
- 3- Sub-acute combined degeneration of the cord
- 4- Viral labyrinthitis
- 5- Wernicke's encephalopathy

Answer & Comments

Answer: 2- Cerebellar CVA

This man has a history of vertigo and the clinical signs of nystagmus. Slurred speech,

intention tremor and past pointing, as well as ataxia, suggest the cerebellum as the site of injury.

This man also has risk factors for cerebrovascular disease including atrial fibrillation and hypertension.

Labyrinthitis would not produce cerebellar signs despite being associated with nystagmus.

In Wernicke's encephalopathy, you would expect confusion with ophthalmoplegia and ataxia.

Sub-acute combined degeneration of the cord is associated with posterior column signs, loss of vibration sensation and a positive Romberg's test.

Brainstem signs would be expected with a brainstem CVA and impaired conscious level.



[Q: 4041] OnExamination 2012 - Neurology

An 85-year-old woman with diabetes mellitus presented with sudden onset of wild flinging movements of the left arm which disappeared during sleep.

What is the most likely explanation?

- 1- Contralateral subthalamic nucleus infarction
- 2- Focal motor seizures
- 3- Hypoglycaemia
- 4- Ipsilateral caudate nucleus infarction
- 5- Ipsilateral cerebellar infarction

Answer & Comments

Answer: 1- Contralateral subthalamic nucleus infarction

This is hemiballismus, and in a diabetic patient is likely to be due to a vascular event in the contralateral subthalamic nucleus.



[Q: 4042] OnExamination 2012 - Neurology

A 68-year-old female presents with a four month history of weight loss, headaches and had recently developed double vision.

Six years previously she underwent a right mastectomy for breast carcinoma and remains on treatment with tamoxifen.

Examination revealed tenderness over the temporal region and a left sixth nerve palsy.

Her chest x ray was reported as normal, but she had an ESR of 100 mm/hr (0-30) and her Hb was 10.8 g/dL (11.5-16.5).

Which of the following statements is correct?

- 1- An isotope bone scan should be performed
- 2- An urgent CT brain scan is required
- 3- She should be given diamorphine
- 4- She should be treated with prednisolone immediately
- 5- She should have a lumbar puncture

Answer & Comments

Answer: 4- She should be treated with prednisolone immediately

Giant cell arteritis is a clinical emergency.

High doses of steroids (1mg/kg) should be initiated as soon as possible to prevent visual loss, which is usually irreversible.

Typical clinical features include:

Headache

Tender non-pulsatile temporal artery

Systemic symptoms of lethargy, weight loss, pyrexia, jaw claudication, visual loss and diplopia (various ophthalmoplegias are recognised in association with GCA).

It is also associated with polymyalgia rheumatica.

Sometimes the vignette will give you too many details. Your task is to decide what is important. For example breast ca. could raise the ESR and therefore put you off the idea that this is TA. The point is to realise that this is an important consideration not to miss as otherwise the patient could go blind and should be given steroids, followed by biopsy.



[Q: 4043] OnExamination 2012 - Neurology

A 28-year-old female, three days post-partum, develops severe headache associated with seizures.

During her pregnancy her blood pressure had been mildly elevated in the third trimester.

On examination, she had a GCS of 15 but was slightly confused and drowsy. Her temperature was 37.5°C, she had mild nuchal rigidity but neurological examination was otherwise normal.

What is the most likely diagnosis?

- 1- Bacterial meningitis
- 2- Cortical vein thrombosis
- 3- Eclampsia
- 4- Intracerebral haemorrhage
- 5- Subarachnoid haemorrhage

Answer & Comments

Answer: 2- Cortical vein thrombosis

Post-partum period is a risk factor of cortical vein and sinus thrombosis.

It typically presents with headache, seizures and focal neurological deficit two to three weeks postpartum (but is also seen earlier).

Other clinical presentations include a benign intracranial hypertension (BIH) type of picture (papilloedema, visual disturbances and headaches) or a subacute encephalopathic picture. Thrombophilia screen should be performed.

Eclampsia typically improves following delivery but despite this 1/3 of seizures occur in the four days following delivery, the seizures can in fact occur antepartum, intrapartum, or postpartum. If a seizure does occur postpartum, it usually occurs within the first 24 hours after delivery.

Although eclampsia would be in the differential diagnosis in this case, nuchal rigidity is not a typical feature which points more to the direction of cortical vein thrombosis.



[Q: 4044] OnExamination 2012 - Neurology

A 26-year-old man presented with a 24 hour history of blurred vision in the left eye and mild left frontal headache. He had a ten year history of diabetes mellitus.

Examination of the left eye revealed a central scotoma.

What is the most likely diagnosis?

- 1- Central retinal artery occlusion
- 2- Diabetic retinopathy
- 3- Migraine
- 4- Optic neuritis
- 5- Pituitary tumour

Answer & Comments

Answer: 4- Optic neuritis

Occlusion of the central retinal artery or one of its branches which supplies the macular region will result in almost immediate diminution or loss of visual acuity in the involved eye and is usually without pain.

In a young diabetic the aetiology is usually an embolus of the central retinal artery or one of its branches. However there is pain associated with this visual loss, namely headache.

Diabetes is a cause of optic neuritis which is usually associated with headache.

Retinopathy, per se, would not lead to an acute central scotoma unless there was acute bleeding from neovascularisation.



[Q: 4045] OnExamination 2012 - Neurology

A 63-year-old man presents with a three month history of tremor affecting his left arm.

In his past medical history he had suffered from a depressive psychosis for 10 years for which he had received intermittent chlorpromazine and amitriptyline but had not taken any therapy for the last four months. He describes that his two brothers also had tremors.

On examination he had a resting tremor of his left hand, with cogwheel rigidity of that arm and he had a mild generalised bradykinesia.

What is the most likely diagnosis?

- 1- Benign essential tremor
- 2- Drug-induced parkinsonism
- 3- Idiopathic Parkinson's disease
- 4- Multiple system atrophy
- 5- Wilson's disease

Answer & Comments

Answer: 3- Idiopathic Parkinson's disease

The most likely diagnosis is idiopathic Parkinson's disease due to the fact that the symptoms and signs are present only on the left side. Parkinson's disease is a common neurodegenerative disorder which selectively affects dopaminergic neurons of the substantia nigra, culminating in their destruction. After approximately 50% of the dopamine neurones, and 75-80% of striatal dopamine is lost patients start to exhibit the classical signs of bradykinesia, resting tremor

and rigidity. These signs are often unilateral initially.

Despite many years of research, the cause of Parkinson's disease is not fully understood. The relative contribution of genetic and environmental factors still remains unclear.

Neuroleptic-induced parkinsonism is usually bilateral and symmetrical.

Essential tremor does not cause rest tremor (it usually causes bilateral postural and action tremor).

It is unusual for Wilson's disease to present this late in life.

Multi-system atrophy is characterised by Parkinsonian features, cerebellar ataxia and autonomic dysfunction.



[Q: 4046] OnExamination 2012 - Neurology

A 69-year-old man is admitted with pain and numbness in his right foot following a right hip replacement.

In his past medical history he had been treated for lower backache by his GP.

On examination there was weakness of all movements at the right ankle, with absent right ankle jerk, and sensory impairment on the lateral aspect and sole of the foot.

Where is the most likely site of the lesion?

- 1- Femoral nerve
- 2- Lumbosacral plexus
- 3- Obturator nerve
- 4- Sciatic nerve
- 5- S1 spinal root

Answer & Comments

Answer: 4- Sciatic nerve

Sciatic nerve palsy is a known complication of a total hip replacement (femoral nerve palsy can occur but is much less common).

It causes global weakness of the ankle due to the involvement of both of its branches: tibial nerve (plantarflexion and inversion) and common peroneal nerve (dorsiflexion and eversion).

The right ankle jerk is absent due to tibial nerve involvement.



[Q: 4047] OnExamination 2012 - Neurology

A 39-year-old painter presents with a burning pain in both feet, which has deteriorated over the last six months.

He drinks 60 units of alcohol weekly and has a family history of pernicious anaemia.

On examination he has impairment of all modalities of sensation in both feet but particularly pain, temperature and absent ankle jerks.

What is the most likely diagnosis?

- 1- Alcoholic peripheral neuropathy
- 2- Chronic inflammatory demyelinating polyradiculopathy
- 3- Hereditary sensory neuropathy
- 4- Lead neuropathy
- 5- Vitamin B₁₂ deficiency

Answer & Comments

Answer: 1- Alcoholic peripheral neuropathy

Alcohol abuse and diabetes are the commonest causes of peripheral neuropathy in the United Kingdom.

Vitamin B₁₂ deficiency causes neuropathy that affects only the dorsal column (joint position, light touch and vibration).

Lead neuropathy is purely motor affecting mainly the upper limbs.

Chronic inflammatory demyelinating polyradiculopathy causes mainly motor impairment (distal and proximal).



[Q: 4048] OnExamination 2012 - Neurology

A 25-year-old woman presented with a history of confusion and fever that had worsened gradually over the preceding four days.

On examination she was drowsy and had mild neck stiffness. Neurological examination revealed an extensor left plantar response. A CT scan of her brain showed an area of low attenuation in the right temporo-parietal region.

What is the most likely diagnosis?

- 1- Cerebral toxoplasmosis
- 2- Herpes simplex encephalitis
- 3- Listerial meningoenzephalitis
- 4- Pneumococcal meningitis
- 5- Pyogenic brain abscess

Answer & Comments

Answer: 2- Herpes simplex encephalitis

Herpes simplex encephalitis (HSE) often presents subacutely over several days with declining cerebral function. The temporal or temporo-parietal regions are affected earlier and neuro-imaging usually demonstrates this. However, temporal lobe involvement is not pathognomonic of HSE.

Cerebral toxoplasmosis is the result of reactivation of toxoplasmosis in severely immunocompromised individuals.

Listeriosis is associated with the consumption of soft cheese.

Streptococcus pneumoniae causes acute pyogenic meningitis and is often associated with suppurative otitis media or sinusitis.

Brain abscesses are usually readily demonstrable by cranial CT scans.



[Q: 4049] OnExamination 2012 -
Neurology

A 62-year-old man seeks an opinion due to a tremor mostly affecting the right hand but also latterly the left hand which has gradually deteriorated over five years.

Past medical history includes asthma for which he takes inhaled salbutamol, hypertension for which he takes bendroflumethiazide and lisinopril and depression for which he takes amitriptyline.

He smoked 10 cigarettes daily and drank approximately 15 units of alcohol weekly, noting an improvement in his tremor following alcohol.

Examination revealed some mild titubation and a postural tremor in both arms with no worsening during finger-nose testing.

What is the most likely diagnosis?

- 1- Benign essential tremor
- 2- Hyperthyroidism
- 3- Parkinson's disease
- 4- Physiological tremor
- 5- Salbutamol-induced tremor

Answer & Comments

Answer: 1- Benign essential tremor

The features of relief with alcohol, postural tremor and a slight and rather benign deterioration over five years suggests a diagnosis of benign essential tremor.

Physiological tremor usually affects the hands only.

In this case there is titubation, again a feature of essential tremor.

The mild features argue against Parkinson's disease.

The condition is typically slowly progressive and occurs from approximately 50 years.



[Q: 4050] OnExamination 2012 -
Neurology

A 62-year-old man seeks an opinion about a tremor which mostly affects his right hand but also latterly his left hand and which has gradually deteriorated over five years.

His medical history includes asthma for which he takes inhaled salbutamol, hypertension for which he takes bendroflumethiazide and lisinopril and depression for which he takes amitriptyline.

He smokes 10 cigarettes daily and drinks approximately 15 units of alcohol weekly, noting an improvement in his tremor following alcohol.

Examination reveals some mild titubation and a postural tremor in both arms with no worsening during finger-nose testing.

What is the most likely diagnosis?

- 1- Benign essential tremor
- 2- Hyperthyroidism
- 3- Parkinson's disease
- 4- Physiological tremor
- 5- Salbutamol-induced tremor

Answer & Comments

Answer: 1- Benign essential tremor

The features of relief with alcohol, postural tremor and a slight and rather benign deterioration over five years suggests a diagnosis of benign essential tremor.

Physiological tremor usually affects the hands only.

In this case there is titubation, again a feature of essential tremor.

The mild features argue against Parkinson's disease.

The condition is typically slowly progressive and occurs from approximately 50 years.



[Q: 4051] OnExamination 2012 -
Neurology

A 60-year-old woman presented with a small right pupil, right ptosis and impaired sweating over the ipsilateral forehead. Sweating on the rest of the face was unaffected.

Where is the most likely site of this lesion?

- 1- Cervical spinal cord
- 2- Common carotid artery
- 3- Hypothalamus
- 4- Internal carotid artery
- 5- Lateral medulla

Answer & Comments

Answer: 4- Internal carotid artery

Because the sympathetic plexus accompanying the internal carotid artery innervates sweat glands only to the medial forehead, facial anhydrosis does not occur significantly with postganglionic Horner syndrome.



[Q: 4052] OnExamination 2012 -
Neurology

A 24-year-old man presents with a headache that has been present for nine months. He has headache almost every day, mainly frontal, sometimes with nausea.

Current medication includes paracetamol, brufen and codeine with only transient relief of symptoms. He has a history of depression. Examination was normal.

What is the most likely diagnosis?

- 1- Analgesic misuse headache
- 2- Cluster headache
- 3- Frontal brain tumour
- 4- Headache due to depression
- 5- Migraine

Answer & Comments

Answer: 1- Analgesic misuse headache

This is one of the commonest causes of chronic daily headache (the commonest is chronic tension type headache).

It is commonly caused by the chronic use of analgesics such as codeine phosphate and paracetamol.

Treatment consists of reducing the amount of analgesics gradually until stopped.



[Q: 4053] OnExamination 2012 -
Neurology

Which of the following relate to dopa-decarboxylase inhibitors?

- 1- Enhance the effect of levodopa on the substantia nigra
- 2- Reduce the extracerebral complications of L-dopa therapy
- 3- Have anticholinergic activity
- 4- Should not be given in combination with dopamine agonists
- 5- Prevent L-dopa associated dyskinesias

Answer & Comments

Answer: 2- Reduce the extracerebral complications of L-dopa therapy

A. Dopa-decarboxylase inhibitors prevent the systemic metabolism of levodopa which leads to higher central nervous system (CNS) levels. The effect itself is not enhanced, only the concentration of available levodopa.

B. These include nausea, vomiting, postural hypotension and cardiac arrhythmias.

D. The combination makes dyskinetic movements more likely.

E. No. Dyskinesias are a CNS effect of levodopa.



[Q: 4054] OnExamination 2012 -
Neurology

Which of the following would be the result of a spinal lesion at the level of C8?

- 1- A reduced brachioradialis reflex
- 2- Inability to abduct the shoulder
- 3- Loss of sensation over the lateral aspect of the arm
- 4- Winging of the scapula
- 5- Weakness of finger flexion

Answer & Comments

Answer: 5- Weakness of finger flexion

A. Brachioradialis is the "supinator" reflex and it is mediated by C5/6.

B. Deltoid is supplied by C5/6.

C. Medial; forearm and hand are affected. Lateral aspect of arm is C5.

D. This is caused by paralysis of the long thoracic nerve to serratus anterior (C5, 6, 7).



[Q: 4055] OnExamination 2012 -
Neurology

Which of the following would be expected following distal occlusion of the posterior cerebral artery?

- 1- Cerebellar ataxia
- 2- Contralateral hemiplegia
- 3- Dysarthria
- 4- Homonymous hemianopia
- 5- Palatal palsy

Answer & Comments

Answer: 4- Homonymous hemianopia

The following would also be expected:

Distal (peripheral territory) posterior cerebral artery stroke

Homonymous hemianopia (often upper quadrantic)

Cortical blindness

Verbal dyslexia without agraphia

Hemivisual neglect

Visual hallucinations.

(Harrisons).



[Q: 4056] OnExamination 2012 -
Neurology

A 50-year-old male epileptic presents with paraesthesia of hands and feet. He also has unsteadiness when walking.

On examination he has Dupuytren's contracture in his left hand, a peripheral sensory neuropathy and palpable lymph nodes in his neck and axillae.

Which of the following drugs is the most likely cause of these features?

- 1- Carbamazepine
- 2- Clonazepam
- 3- Lamotrigine
- 4- Phenytoin
- 5- Sodium valproate

Answer & Comments

Answer: 4- Phenytoin

Phenytoin is well known to cause neurological side effects such as peripheral sensory neuropathy and cerebellar ataxia.

Other side effects include:

Gingival hypertrophy

Lymphadenopathy

Hypocalcaemia

Hirsutism.



[Q: 4057] OnExamination 2012 -
Neurology

Which of the following is true of the anticonvulsant, levetiracetam?

- 1- Acts via the gamma-aminobutyric acid (GABA) receptor
- 2- Is associated with increased plasma concentrations of sodium valproate
- 3- Is associated with induction of hepatic cytochrome p450 enzymes
- 4- Is used as monotherapy for the treatment of generalised convulsions
- 5- Is well absorbed via the oral route

Answer & Comments

Answer: 5- Is well absorbed via the oral route

Levetiracetam (Keppra) is an adjunctive treatment for partial seizures with or without secondary generalisation. Its mechanism of action is unknown.

It is rapidly absorbed orally, it does not effect hepatic enzymes but dose reduction is required in renal failure.

The drug appears to be well tolerated with few side effects.



[Q: 4058] OnExamination 2012 -
Neurology

A 72-year-old female presents with general slowness.

Examination reveals a tremor of the hands.

What frequency of tremor would you suspect in Parkinson's disease?

- 1- 1 Hz
- 2- 2 Hz
- 3- 5 Hz
- 4- 8 Hz
- 5- 10 Hz

Answer & Comments

Answer: 3- 5 Hz

The typical tremor associated with Parkinson's disease is 4-6 Hz although in a minority the tremor may be faster - 8 Hz. This rate is more typical of essential tremor.



[Q: 4059] OnExamination 2012 -
Neurology

A 56-year-old woman presents with problematical tremor which has deteriorated over the last three months and she notes that it is exacerbated by changes in position.

She has a past history of asthma for which she is taking inhaled salbutamol and one year ago she underwent liver transplantation for primary biliary cirrhosis for which she takes cyclosporin.

On examination she seems quite well but has a noticeable coarse tremor of her outstretched hands. There are no other abnormalities noticeable on neurological examination.

How should this patient be managed?

- 1- Add benzhexol
- 2- L-dopa
- 3- Propranolol
- 4- Reduce dose cyclosporin
- 5- Reduce dose salbutamol

Answer & Comments

Answer: 4- Reduce dose cyclosporin

Cyclosporin is well known to cause coarse tremor. In the first instance the dose should be reduced. Usually the neurological side effects of cyclosporin are dose dependent.

The tremor with salbutamol tends not to be coarse as described in this case, being approximately 10-12 Hz..



[Q: 4060] OnExamination 2012 - Neurology

Which of the following is true concerning baclofen?

- 1- Acts directly on skeletal muscle
- 2- Causes hallucinations when withdrawn
- 3- Causes rhabdomyolysis
- 4- Reduces Ca²⁺ release from sarcoplasmic reticulum
- 5- Reduces cerebral but not spinal spasticity

Answer & Comments

Answer: 2- Causes hallucinations when withdrawn

The primary site of action is the spinal cord by depressing monosynaptic and polysynaptic transmission. It can hyperpolarise cells by increasing K⁺ conductance and inhibit Ca²⁺ channels in others.

Rhabdomyolysis is caused by:

Clofibrate

Aminocaproic acid

HMG-CoA reductase inhibitors

Neuroleptics (neuroleptic malignant syndrome).

Avoid abrupt withdrawal as it can cause serious side-effects including autonomic dysreflexia.



[Q: 4061] OnExamination 2012 - Neurology

TAR DNA-binding protein 43 (TDP-43) is associated with which neurological dysfunction?

- 1- Demyelinating disease
- 2- Myopathic disease
- 3- Neurodegenerative disease
- 4- Neuro-oncologic disease

5- Peripheral neuropathies

Answer & Comments

Answer: 3- Neurodegenerative disease

TDP43 is a protein that has recently been found to be involved in a multitude of neurodegenerative diseases including dementia and motor neuron disease.



[Q: 4062] OnExamination 2012 - Neurology

A 40-year-old man presents to the Emergency department.

His wife says he has not been himself for the past few days, becoming aggressive over trivial things and yesterday he could not work out how to use the TV remote control. When she confronted him he told her that he had a headache. Today she found him in the kitchen picking at his clothes and smacking his lips. He would not respond to her when she called him. This lasted for a few minutes. Afterwards he was confused and unable to remember this episode.

On examination his temperature is 37.9°C and he is becoming increasingly drowsy. Blood tests show a leucocytosis.

Which of the following is the most likely diagnosis?

- 1- Bacterial meningitis
- 2- HSV encephalitis
- 3- Listerial rhombencephalitis
- 4- Drug overdose
- 5- Subdural haemorrhage

Answer & Comments

Answer: 2- HSV encephalitis

This question emphasises the importance of a collateral history in drowsy patients - the diagnosis is in the patient's wife's description of recent events.

Patients with encephalitis usually complain of a headache.

Encephalitis causes impairment of consciousness. This often progresses from personality change early on leading to confusion and drowsiness.

HSV typically affects the temporal lobes. This can cause complex partial seizures.

HSV infections may cause pyrexia and leucocytosis or leucopenia.

A. Bacterial meningitis is not the answer. The history of personality change and a complex partial seizure is not typical for this condition.

B. The answer is HSV encephalitis. Patients with encephalitis typically complain of headache and have impairment of consciousness. The patient's wife gives a good history of this - he has a change in personality then becomes confused. This progresses to drowsiness on admission. The episode in the kitchen fits with a complex partial seizure. HSV typically affects the temporal lobes and may cause this. The temperature and leucocytosis also fit with an infective cause. This question emphasises the importance of a collateral history in drowsy patients - the diagnosis is in the patient's wife's description of recent events.

C. The answer is not listerial rhombencephalitis. As discussed the history is good for an infective encephalitis. However Listeria tends to affect immunocompromised patients. It tends to cause a basal meningoencephalitis with associated symptoms of lower cranial nerve palsies and myoclonus. This does not fit well.

D. Drug overdose is not the answer. An overdose of antidepressants can cause serotonin syndrome. This is associated with drowsiness, pyrexia and seizures. However the confusion the previous day does not fit. You would also expect the seizures to be generalised.

E. Subdural haemorrhage is not the answer. There is no history of trauma and the pyrexia and leucocytosis do not fit. Subdural haemorrhages are more common in the elderly and alcoholics.



[Q: 4063] OnExamination 2012 - Neurology

A 40-year-old man is admitted with a one day history of increasing drowsiness.

He had a diarrhoeal illness two weeks ago from which he made a full recovery. His wife says that over the past three days he had developed double vision and had begun to 'walk like he was drunk'.

On examination he has mild proximal weakness and brisk symmetrical reflexes. Sensation is intact and plantars are down going.

Which of the following is the most likely diagnosis?

- 1- Bickerstaff's encephalitis
- 2- Miller-Fisher variant Guillain-Barre syndrome
- 3- Multiple sclerosis
- 4- Wallenberg's syndrome
- 5- Weber's syndrome

Answer & Comments

Answer: 1- Bickerstaff's encephalitis

Bickerstaff's encephalitis is usually preceded by an infection, typically Campylobacter jejuni.

It is associated with autoantibodies against gangliosides, typically anti-GQ1b IgG, in the serum.

Bickerstaff's encephalitis affects the brainstem, this may be seen on MRI with hyperintensities on T2 weighted images.

It causes drowsiness, ophthalmoparesis, ataxia and brisk reflexes.

The drowsiness and brisk reflexes can be used to differentiate it from Miller-Fisher.

Bickerstaff's encephalitis is the answer. This is a rare immune disorder affecting the brainstem. It is usually preceded by an infection, typically *Campylobacter jejuni*.

It is associated with autoantibodies against gangliosides, typically anti-GQ1b IgG, in the serum. It causes drowsiness, ophthalmoparesis, ataxia and brisk reflexes. The drowsiness and brisk reflexes can be used to differentiate it from Miller-Fisher.

It may be seen on MRI as hyperintensities in the brain stem on T2 weighted images.

Miller-Fisher variant Guillain-Barre syndrome is not the answer as it is not associated with drowsiness and typically causes reduced or absent reflexes.

Multiple sclerosis (MS) is not the answer. The history is very acute for MS and there is no association with diarrhoea. MS is not typically associated with drowsiness.

Wallenberg's syndrome is not the answer. This is most commonly caused by infarction of the lateral medulla. It causes ipsilateral Horner's syndrome, loss of facial pin-prick and temperature sensation, with preserved light touch and corneal reflex. There is contralateral loss of pain and temperature sense in the limbs and trunk.

Weber's syndrome is not the answer. This is a lesion of the cerebral peduncle and causes an ipsilateral third nerve lesion and contralateral hemiparesis.



[Q: 4064] OnExamination 2012 - Neurology

A 72-year-old man is brought to the Emergency department by his wife. He became agitated and confused whilst out shopping. He is really very upset and complains that he has no recollection about what has happened that day and has no idea

at all how he suddenly got to the supermarket with his wife.

He has a history of hypertension for which he takes ramipril, and he takes aspirin 75 mg on the advice of his doctor, but has no other significant past medical history.

On examination his BP is well controlled at 135/75 mmHg, his pulse is 70 and regular. Neurological examination is normal and he behaves appropriately when asked to perform set tasks.

Investigations show:

Haemoglobin 13.5 g/dl (13.5-17.7)

White cell count $7.0 \times 10^9/L$ (4-11)

Platelets $190 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (135-146)

Potassium 4.3 mmol/l (3.5-5)

Creatinine 108 $\mu\text{mol/l}$ (79-118)

CT head Normal

Which of the following is the most appropriate therapy for him?

1- Clopidogrel

2- Dipyridamole SR and aspirin in combination

3- Fluoxetine

4- Reassurance

5- Sodium valproate

Answer & Comments

Answer: 4- Reassurance

This man's history is typical of that for transient global amnesia.

The cause of transient global amnesia is unknown but it may be related to a migrainous phenomenon or transient ischaemia.

It is claimed that the condition may be associated with neuronal loss in the hippocampal area or abnormal metabolism

by neurones in this area leading to build up of lactate, but definitive proof does not exist.

No specific therapy for the condition is required; specifically no increased use of anti-platelet agents is needed.



[Q: 4065] OnExamination 2012 - Neurology

A 67-year-old man presents with a severe headache, the worst he has ever had, affecting the back of his head and his neck.

On admission to the Emergency department he is very agitated and requires opiate based pain relief for his headache. He has a history of hypertension for which he takes ramipril, amlodipine and indapamide. His BP is elevated at 185/100 mmHg and he has a tachycardia of 90 BPM.

He is severely photophobic and finds it impossible to comply with ophthalmoscopy. Neurological examination, as far as you can tell, is normal.

Investigations show

Haemoglobin 11.1 g/dl(13.5-17.7)

White cell count $4.2 \times 10^9/L$ (4-11)

Platelets $231 \times 10^9/L$ (150-400)

Sodium 143 mmol/l (135-146)

Potassium 4.3 mmol/l (3.5-5)

Creatinine 90 $\mu\text{mol/l}$ (79-118)

CT head Left parietal lobe haemorrhage

What neurological finding would you most expect?

1- Acalculia

2- Dysphagia

3- Expressive dysphasia

4- Left hemiplegia

5- Contralateral homonymous superior quadrantanopia

Answer & Comments

Answer: 1- Acalculia

The dominant parietal lobe (usually the left) is important for perception, interpretation of sensory information and the formation of motor responses. The non-dominant lobe has a number of visual-spatial functions. Involvement of the optic tract, in either lobe, causes a contralateral homonymous inferior quadrantanopia. Typical signs associated with different lesions are:

Post-central gyrus (anterior parietal lobe), dominant or non-dominant:

- Impaired proprioception
- Impaired two point discrimination
- Agraphism
- Astereognosis
- Sensory +/- visual inattention

Superior parietal lobule, dominant or non-dominant:

- Balint syndrome: optic ataxia
- Impaired spatial processing

Inferior parietal lobule, dominant or non-dominant:

- Sensory extinction
- Asteroagnosia
- Dysgraphaesthesia

Dominant inferior parietal lobule:

- Acalculia
- Agraphia
- Left/right confusion
- Finger agnosia
- Receptive dysphasia
- Alexia or dyslexia
- Gerstmann's syndrome

Non-dominant inferior parietal lobule:

- Geographical agnosia
- Phonagnosia
- Constructional apraxia
- Anosognosia
- Spatial neglect of the contralateral limb
- Dressing apraxia

Expressive dysphasia is caused by damage to the posterior inferior frontal gyrus.

Homonymous superior quadrantanopia is caused by a lesion of the temporal lobe.

Dysphagia is caused by a number of neurological conditions, but not specifically a lesion of the parietal lobe.



[Q: 4066] OnExamination 2012 - Neurology

A 28-year-old woman who is getting married soon comes to the clinic complaining that her right pupil is much larger than the other. She says that she first noticed this a few weeks ago after suffering from an attack of shingles.

On examination the pupil is larger than the other, reacts poorly to light, but appears to have a normal near reflex.

Which of the following is the most likely diagnosis?

- 1- Argyll-Robertson pupil
- 2- Holmes-Adie pupil
- 3- Horner's syndrome
- 4- Normal variant
- 5- Third nerve palsy

Answer & Comments

Answer: 2- Holmes-Adie pupil

The Holmes-Adie pupil usually occurs after a herpes zoster infection, which initially leads

to an abnormally large pupil poorly reactive to light with a normal near reflex.

Over years it gradually diminishes in size actually to be smaller than the non-affected pupil.

The diagnosis is supported by an abnormally vigorous reaction to weak pupil constricting eye drops, which can be compared to the changes seen on the normal side.



[Q: 4067] OnExamination 2012 - Neurology

A 49-year-old owner of a pub is admitted in a confused and agitated state. He has recently tried to stop drinking and according to his wife it is 24 hours since his last drink.

When you see him his BP is elevated at 155/90 mmHg, pulse at 90, and he looks agitated. There are signs of chronic liver disease on physical examination. He is trying to pull the sheets over his head as he tells you he can see a large dog in the next bed.

Investigations show:

Haemoglobin 10.9 g/dl(13.5-18)

White cell count $8.2 \times 10^9/L$ (4-10)

Platelets $190 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (134-143)

Potassium 4.3 mmol/l (3.5-5)

Creatinine 110 $\mu\text{mol/l}$ (60-120)

Glucose 4.5 mmol/l (3.6-5.8)

ALT 190 IU/l (5-60)

Which of the following is the most likely diagnosis?

- 1- Alcoholic hallucinosis
- 2- Delirium tremens
- 3- Hypomania
- 4- Schizophrenia
- 5- Wernicke's encephalopathy

Answer & Comments

Answer: 1- Alcoholic hallucinosis

As many as 25% of habitual alcohol drinkers may suffer from alcoholic hallucinosis when they withdraw from alcohol for 24 hours or longer. Hallucinations are usually visual or tactile, but may be auditory and persecutory.

Delirium tremens is associated with a much more profound disorientation and agitation, with severe autonomic dysfunction and cardiovascular collapse. It may well be preceded by alcohol withdrawal seizures.

Management of this patient involves B vitamin replacement with a preparation such as Pabrinex, and the use of appropriate withdrawal medication.



[Q: 4068] OnExamination 2012 - Neurology

A 46-year-old man is found to have nystagmus.

On closer examination it is downbeat nystagmus.

Which of the following conditions is the most likely to cause this clinical finding?

- 1- Aqueduct stenosis
- 2- Central cerebellar lesion
- 3- Chiari type I malformation
- 4- Unilateral medial longitudinal fasciculus lesion
- 5- Wernicke's encephalopathy

Answer & Comments

Answer: 3- Chiari type I malformation

Nystagmus is defined as involuntary oscillations of the eyes.

This may be pendular when the oscillations are equal in rate and amplitude, or jerking when there are quick and slow phases. (The quicker phase is used to define the direction.)

Nystagmus may be caused by:

Visual disturbances

Lesions of the labyrinth

The central vestibular connections

Brain stem or cerebellar lesions.

Pendular nystagmus is usually due to loss of macular vision, but may be seen in diffuse brain stem lesions.

Jerking nystagmus which is of constant direction regardless of the direction of gaze, suggests a labyrinthine or cerebellar lesion.

Nystagmus which changes with the direction of gaze suggests widespread central involvement of vestibular nuclei.

Jerking nystagmus present only on lateral gaze, and the fast component of which is in the direction of gaze, indicates a lesion of the brain stem or cerebellum.

Nystagmus confined to one eye suggests a peripheral lesion of the nerve or muscle, or a lesion of the medial longitudinal bundle.

Nystagmus restricted to the abducting eye on lateral gaze (ataxic nystagmus) is due to a lesion of the medial longitudinal bundle between the pons and mid-brain as in multiple sclerosis (MS).

Nystagmus occurring on upward gaze with the fast component upwards (upbeat nystagmus) may be due to a lesion in the mid-brain at the level of the superior colliculus.

Downbeat nystagmus (fast phase downwards) suggests a lesion in the lower part of the medulla. It is therefore typical of the Arnold-Chiari malformation.

Wernicke's or thiamine deficiency is a rare cause of downbeat nystagmus and therefore is not as likely a diagnosis as the Arnold Chiari malformation in the option list.



[Q: 4069] OnExamination 2012 -
Neurology

A 72-year-old man presents with Parkinson's disease.

Which of the following is a likely mechanism underlying the neurodegeneration seen in this condition?

- 1- Aberrant fusion of 2 genes
- 2- Impaired protein degradation
- 3- Over expression of cellular oncogene
- 4- Post-translational modification
- 5- Telomere shortening

Answer & Comments

Answer: 2- Impaired protein degradation

Mutations in either the parkin gene or UCHL1 lead to impaired protein degradation.

The other genetic abnormalities concern other diseases not Parkinson's.

Impaired protein degradation is also seen in other neurodegenerative conditions.



[Q: 4070] OnExamination 2012 -
Neurology

A 67-year-old man has drunk 8 units of alcohol a day for most of his adult life.

He has worsening symptoms of poor memory, a wide-based gait and urinary incontinence for ten months.

What is the most likely diagnosis?

- 1- HIV encephalitis
- 2- Meningovascular syphilis
- 3- Normal pressure hydrocephalus
- 4- Syringomyelia
- 5- Wernicke-Korsakoff syndrome

Answer & Comments

Answer: 3- Normal pressure hydrocephalus

The triad of memory loss, gait difficulties and urinary incontinence will lead towards the diagnosis of normal pressure hydrocephalus.

In this scenario, the alcohol is a distractor.



[Q: 4071] OnExamination 2012 -
Neurology

A 35-year-old man with a known history of epilepsy presents with a skin rash, lymphadenopathy and gingival hypertrophy.

Which of the following medications is most likely to be responsible for his symptoms?

- 1- Carbamazepine
- 2- Lamotrigene
- 3- Lorazepam
- 4- Phenytoin
- 5- Sodium valproate

Answer & Comments

Answer: 4- Phenytoin

Common side effects of phenytoin include gingival hyperplasia, coarsening of the facies, and hirsutism.

Phenytoin is linked to a hypersensitivity syndrome manifested by fever, rash, and lymphadenopathy.

Patients receiving phenytoin may develop pseudolymphoma or, rarely, malignant lymphoma and mycosis-fungoides-like lesions.



[Q: 4072] OnExamination 2012 -
Neurology

A 19-year-old girl presents with recurrent episodes of loss of consciousness.

Over the last two years she has had blackouts which last approximately 30 seconds.. They typically occur when she is standing. These have occurred more frequently over the last week. The last episode was witnessed by her

boyfriend who noted that she collapsed without any abnormal movements. On coming round she was rather drowsy initially but generally fine and recovered relatively quickly.

What is the most likely diagnosis?

- 1- Addison's disease
- 2- Atonic seizures
- 3- Cardiac syncope
- 4- Complex partial seizures
- 5- Vasovagal syncope

Answer & Comments

Answer: 5- Vasovagal syncope

This young girl has features suggestive of vasovagal syncope.

The story suggests that:

The episodes always occur when she is standing (whereas cardiac syncope could occur at any time but may be precipitated by exercise)

That there are no abnormal movements (making epilepsy less likely) and

That there is a pretty full recovery (again making epilepsy less likely).



[Q: 4073] OnExamination 2012 - Neurology

A 30-year-old male presents with a week history of right arm weakness. Originally the problem began with severe pain in the neck which radiated into the right shoulder, which was followed by weakness.

Examination revealed winging of the right scapula with weakness of right shoulder abduction and elbow extension. There was some sensory loss over the lateral aspect of the right shoulder and right triceps reflex was absent.

What is the most likely diagnosis?

- 1- C7 entrapment radiculopathy
- 2- Central C5/6 disc prolapse
- 3- Neuralgic amyotrophy
- 4- Suprascapular nerve entrapment
- 5- Traction of lateral cord of brachial plexus

Answer & Comments

Answer: 3- Neuralgic amyotrophy

Neuralgic amyotrophy is a brachial plexopathy (usually upper brachial plexus) usually preceded by an infective picture.

It usually presents with severe pain for days to weeks followed by weakness and sensory loss over the corresponding territory of the brachial plexus (more commonly C5-7).

It is a self-limiting condition but recovery may be slow (years).



[Q: 4074] OnExamination 2012 - Neurology

A 55-year-old woman with multiple sclerosis is treated for severe hip adductor muscle spasticity and two days later develops double vision.

Which one of the following treatments is she likely to have been given?

- 1- Botulinum toxin
- 2- Dantrolene
- 3- Intrathecal baclofen
- 4- Oral baclofen
- 5- Tizanidine

Answer & Comments

Answer: 1- Botulinum toxin

Botulinum toxin is the treatment of choice for focal dystonia (such as torticollis, and hemi-facial spasm) and focal dystonia.

The primary action of the toxin is to block acetylcholine release at the neuromuscular junction and so to produce muscle weakness.

Occasionally systemic absorption of the toxin can affect distal muscles causing symptoms such as diplopia and dysphagia.



[Q: 4075] OnExamination 2012 - Neurology

A 70-year-old man is admitted with an acute stroke.

Examination revealed a left Horner's syndrome, loss of corneal reflex on the left together with loss of pinprick sensation on the left face.

His left gag reflex was also decreased. He had left limb ataxia with right hemi-sensory loss of pain and temperature sensation.

Which one of the following arterial territories has been affected?

- 1- Basilar
- 2- Left posterior communicating
- 3- Left posterior inferior cerebellar
- 4- Right posterior inferior cerebellar
- 5- Right superior cerebellar

Answer & Comments

Answer: 3- Left posterior inferior cerebellar

The clinical features are typical of lateral medullary syndrome.

They consist of:

Ipsilateral signs of Horner's syndrome

Facial loss

Pharyngeal weakness and ataxia and

Contralateral signs of spinothalamic sensory loss of the limbs.

The posterior inferior cerebellar artery is affected.



[Q: 4076] OnExamination 2012 - Neurology

A 50-year-old man presents with a 12 month history of deteriorating memory. He has otherwise been well and takes no medication.

Which one of the following is most typical of frontal lobe dysfunction?

- 1- Inability to draw a clock face
- 2- Inability to generate a list rapidly
- 3- Inability to perform serial 7s
- 4- Sensory inattention
- 5- Visual field defects

Answer & Comments

Answer: 2- Inability to generate a list rapidly

Frontal lobe dementia is a common neurodegenerative condition. It usually affects patients of 45-65 years old.

A failure to generate a list rapidly is a test of frontal lobe (for example, name animals in 60 seconds or words beginning with the letter F, etc).

Dyscalculia is a manifestation of the dominant parietal lobe.

Sensory inattention is a manifestation of parietal lobe dysfunction.

Visual field defect is a manifestation of:

Occipital lobe (homonymous hemianopia)

Temporal lobe (superior quadrantanopia)

Parietal lobe (inferior quadrantanopia)

pathology.



[Q: 4077] OnExamination 2012 - Neurology

A 30-year-old woman complains of daily frontal headaches for the preceding year. They occur at various times of the day and are worse with stress.

On examination, the left pupil is 2 mm larger than the right. It is reactive to accommodation but not to light.

Which of the following features would be inconsistent with the diagnosis?

- 1- Absent biceps jerk
- 2- Exaggerated response to dilute pilocarpine drops instilled in the left eye
- 3- Fine hand tremor
- 4- Ptosis
- 5- Resolution of anisocoria with time

Answer & Comments

Answer: 4- Ptosis

This patient has an Adie pupil which happens to coexist with tension headache.

An absent biceps jerk would be consistent with Holmes-Adie syndrome.

The characteristic abnormality in this condition is degeneration of parasympathetic nerves in the ciliary ganglion which leads to denervation of the pupil and hence hypersensitivity to dilute pilocarpine drops. The affected pupil is usually larger than the other but may constrict with time.

The cause of the associated areflexia is unknown.

A fine hand tremor may accompany anxiety states associated with tension headache but ptosis requires an organic explanation.



[Q: 4078] OnExamination 2012 - Neurology

A 50-year-old man presented with paraesthesia in the ring and little fingers of his right hand.

On examination there was wasting of the hypothenar eminence of his right hand.

Which one of the following movements would you expect to be weak in this patient?

- 1- Abduction of the thumb
- 2- Adduction of the thumb
- 3- Extension of the little finger
- 4- Flexion of the index finger
- 5- Opposition of the thumb

Answer & Comments

Answer: 2- Adduction of the thumb

The clinical features suggest an ulnar neuropathy. The ulnar nerve supplies the hypothenar muscles (opponens digiti minimi, abductor digiti minimi, flexor digiti minimi), the third and fourth lumbricals, dorsal and palmar interossei and adductor pollicis. It also provides sensory innervation to the fifth digit and medial half of the fourth digit.

Abduction and opposition of the thumb and flexion of the index finger are via the median nerve.

Extension of the little finger is via the radial nerve.



[Q: 4079] OnExamination 2012 - Neurology

A 70-year-old woman has a history of dyspnoea and palpitations for six months.

An ECG at that time showed atrial fibrillation. She was given digoxin, diuretics and aspirin.

She now presents with two short-lived episodes of altered sensation in the left face, left arm and leg. There is poor co-ordination of the left hand. ECHO was normal as was a CT head scan.

What is the most appropriate next step in management?

- 1- Anticoagulation
- 2- Carotid endarterectomy
- 3- Clopidogrel
- 4- Corticosteroid treatment
- 5- No action

Answer & Comments

Answer: 1- Anticoagulation

This patient is having symptoms of transient ischaemic attacks most likely due to a cardiac source of emboli.

A normal echocardiogram (ECHO) or computerised tomography (CT) scan head does not rule out thromboembolic events.

There is an increased risk of strokes in patients with atrial fibrillation and hence with the given symptoms formal anticoagulation with warfarin should be considered.



[Q: 4080] OnExamination 2012 - Neurology

A 92-year-old man was admitted in a confused state. He has a history of immobility due to severe lower back pain. He had been losing weight for three months and had complaints of weakness, urinary frequency, thirst, poor urinary stream and constipation.

Lumbar spine x rays show severe osteopenia and collapse of the body of the vertebra at L3.

Investigations show:

Haemoglobin 9.6 g/dl(13.0-18.0)

Sodium 144 mmol/l (137-144)

Potassium 3.9 mmol/l (3.5-4.9)

Urea 10.4 mmol/l (2.5-7.5)

Creatinine 120 mol/l (60-110)

Glucose 8 mmol/l (3.0-6.0)

Dipstick urine Blood ++, protein +

What is the most important immediate investigation?

- 1- Chest x ray
- 2- Monosodium urate (MSU)
- 3- Prostate specific antigen
- 4- Serum calcium
- 5- Serum protein electrophoresis

Answer & Comments

Answer: 4- Serum calcium

The likely underlying diagnosis is myeloma. The symptoms of constipation, weakness and thirst indicate hypercalcaemia.

Serum calcium should be the immediate investigation.



[Q: 4081] OnExamination 2012 - Neurology

A 23-year-old man presents with visual loss in his right eye and this is diagnosed as optic neuritis.

Which one of the following statements would be seen in an afferent pupillary defect?

- 1- Accommodation response is unaffected
- 2- Hypersensitive response to pilocarpine in the affected eye
- 3- Irregular pupil of the affected eye
- 4- Pupil of affected eye larger than the unaffected eye
- 5- Pupil of affected eye smaller than the unaffected eye

Answer & Comments

Answer: 1- Accommodation response is unaffected

Optic neuropathy does not cause any abnormalities of the shape or size of the pupil.

However the light reaction is diminished.

Accommodation is normal.



[Q: 4082] OnExamination 2012 - Neurology

Which of the following statements about the spinal cord is true?

- 1- A lesion of the left side of the spinal cord at C5 causes pyramidal weakness of the right leg
- 2- Centrally placed spinal cord lesions affect joint position sense before other modalities of sensation
- 3- Conus medullaris lesions cause lower motor neurone signs with absent reflexes
- 4- The spinal cord ends at the lower border of the L3 vertebra
- 5- The spinothalamic tracts are supplied principally by the anterior spinal artery

Answer & Comments

Answer: 5- The spinothalamic tracts are supplied principally by the anterior spinal artery

At the pyramidal decussation (lower medulla), 85% fibres cross over forming the lateral corticospinal tract, the remaining forming the ventral corticospinal tract, the fibres of which eventually cross the cord. Hence, a lesion at left side of C5 will cause weakness of the left leg.

Central spinal cord lesions destroy:

Contiguous structures like the anterior horn cells (lower motor neurone signs)

Decussating sensory fibres (pain and temperature) and

The lateral corticospinal tracts (upper motor neurone signs).

Conus medullaris lesion causes:

Wasting and weakness of leg muscles with fasciculations (lower motor neurone signs) and

Hyper-reflexia especially distally (upper motor neurone signs) supplied by the lower sacral segments (glutei)

with sensory loss of buttocks and perineum.

The spinal cord terminates at lower border of L1 vertebra.

Anterior spinal arteries supply corticospinal and spinothalamic tracts, and anterior horns of the grey matter.



[Q: 4083] OnExamination 2012 - Neurology

Which of the following is true of myasthenia gravis (MG)?

- 1- Electrical recordings of single motor unit activity commonly reveal variation in the latency of the various muscle fibre responses (jitter)
- 2- Neurotransmitter released at the motor end plate is greatly reduced
- 3- Repetitive stimulation of a motor nerve produces a reduction in the amplitude of the fifth response compared with the first in 98% of cases (electrodecremental test)
- 4- Subjective improvement in muscle strength following edrophonium is diagnostic of the condition
- 5- There is a strong association with anti-noradrenergic receptor antibodies

Answer & Comments

Answer: 1- Electrical recordings of single motor unit activity commonly reveal variation in the latency of the various muscle fibre responses (jitter)

This is a difficult question.

Anti-acetylcholine (ACh) receptor antibodies are typically found in myasthenia gravis (MG) resulting in reduced ACh receptor numbers but sufficient neurotransmitter is released. This leads to fatiguable weakness.

Single fibre electromyography (EMG) is the most sensitive test for myasthenia gravis. It simultaneously records the variability in potentials of two muscle fibres innervated by an individual axon: jitter. Although abnormal jitter is not specific for MG and may occur in polymyositis and ALS, a large degree of jitter

with minimal other abnormalities is suggestive of the diagnosis. Jitter is the most sensitive emg index in MG but is not specific of the condition. The nerve conductions and electromyogram (EMG) studies are usually normal in myasthenia gravis, but the repetitive stimulation of a nerve may demonstrate decrements of the muscle action potential (far less than 98%). An increase in decrement on stimulation at 3Hz is detectable in some patients.

The Tensilon (edrophonium) challenge test can be used to diagnose MG, or distinguish it from cholinergic crisis. Edrophonium given at increasing doses should produce improvement in muscle strength within a minute. It does this by blocking the breakdown of acetylcholine by cholinesterase and temporarily increases the level of acetylcholine at the neuromuscular junction. However, a positive response is not specific and may occur in amyotrophic lateral sclerosis. There is a risk of bradycardia, asystole and heart block and atropine should therefore be available. Airway support should be used as respiratory weakness can be exacerbated after the edrophonium wears off. Although improved muscle strength after edrophonium is seen, it is not diagnostic but depends more on the clinical presentation and presence of AChR ab.



[Q: 4084] OnExamination 2012 - Neurology

A 40-year-old male is diagnosed with dystrophia myotonica.

Which one of the following features would be expected in this patient?

- 1- Autosomal recessive inheritance
- 2- Cataracts
- 3- Fasciculations would predominate
- 4- Preserved tendon reflexes despite muscle wasting
- 5- Progressive external ophthalmoplegia

Answer & Comments

Answer: 2- Cataracts

Dystrophia myotonica is an autosomal dominant condition with variable penetrance.

Symptoms characteristically begin from the age of 20-30 with weakness and myotonia.

Cataracts

Ptosis

Frontal baldness

Gynaecomastia

Diabetes and

Reduced reflexes with myotonia

are features.



[Q: 4085] OnExamination 2012 - Neurology

A 72-year-old male presents with diplopia.

Which one of the following features would suggest a third nerve palsy?

- 1- Enophthalmos
- 2- Constricted pupil
- 3- Convergent strabismus
- 4- Increased lacrimation
- 5- Unreactive pupil to light

Answer & Comments

Answer: 5- Unreactive pupil to light

Enophthalmos is seen in Horner's syndrome.

In a third nerve palsy there would be a dilated not constricted pupil and a divergent squint, with the affected eye deviated 'down and out'.



[Q: 4086] OnExamination 2012 - Neurology

Which of the following investigations best

supports a diagnosis of new variant CJD?

- 1- CSF analysis
- 2- CT brain
- 3- EMG
- 4- MRI brain
- 5- VEPs

Answer & Comments

Answer: 4- MRI brain

MRI brain typically shows bilateral posterior thalamic high signal abnormalities in a patient with new variant Creutzfeldt-Jakob disease (CJD).

Cerebrospinal fluid (CSF) analysis only shows non-specific changes.

EMG and CT brain are normal.

Sporadic CJD (and not new variant CJD) is associated with specific EEG changes.



[Q: 4087] OnExamination 2012 - Neurology

A 25-year-old woman was recently diagnosed with rheumatoid arthritis.

She has developed weakness, double vision and tiredness.

Examination reveals bilateral weakness of eye abduction, bilateral ptosis, slightly reduced proximal motor power in the limbs, normal reflexes and sensation.

What is the diagnosis?

- 1- Chronic progressive external ophthalmoplegia.
- 2- Guillain-Barre syndrome.
- 3- Multiple sclerosis.
- 4- Myasthenia gravis.
- 5- Polymyositis

Answer & Comments

Answer: 4- Myasthenia gravis.

Myasthenia gravis is well known to be associated with other autoimmune diseases such as pernicious anaemia, thyroid disease and rheumatoid arthritis.

In Guillain-Barre syndrome you would expect absent reflexes.

Polymyositis does not usually cause ptosis or ophthalmoplegia.



[Q: 4088] OnExamination 2012 - Neurology

A 75-year-old man presents with 12 months history of cognitive impairment, parkinsonism, intermittent confusion and generalised myoclonus.

He was started on 62.5 three times daily of Sinemet. In the following two months he has started experiencing visual hallucinations.

Which of the following is the most likely diagnosis?

- 1- Alzheimer's disease
- 2- Diffuse Lewy body disease
- 3- Idiopathic Parkinson's disease
- 4- Multiple system atrophy
- 5- Progressive supranuclear palsy

Answer & Comments

Answer: 2- Diffuse Lewy body disease

Diffuse Lewy body disease presents with:

Cognitive impairment

Visual hallucinations

Intermittent confusion

Parkinsonism

Myoclonus and

Marked sensitivity to neuroleptic treatment.

Visual hallucinations in Parkinson's disease treated with L-dopa usually appear late (more than two years after initiation of treatment).

Visual hallucinations are not features of multiple system atrophy or progressive supranuclear palsy.



[Q: 4089] OnExamination 2012 - Neurology

A 65-year-old man presents with four months history of swallowing difficulties (worse with liquids than solids).

He also complains of nasal regurgitation, coughing and choking episodes during meals and slight dysarthria. He lost one stone over the last eight weeks.

Which of the following investigations is the most appropriate for this case?

- 1- Acetyl choline receptors antibodies
- 2- Barium swallow
- 3- CXR
- 4- Gastroscopy
- 5- Tumour markers

Answer & Comments

Answer: 1- Acetyl choline receptors antibodies

Nasal regurgitation, coughing and choking episodes during meals, dysphagia that is worse with liquids than solids and dysarthria indicate neurogenic dysphagia.

Important causes at this age include myasthenia gravis and motor neuron disease. Lambert Eaton syndrome very rarely affects the bulbar muscles.

Myasthenia gravis is an antibody-mediated disorder which reduces the efficiency of signal transduction across the neuromuscular junction. There is resultant weakness of the innervated muscle, which increases with fatigue. The commonest associated auto-

antibodies are against the nicotinic acetylcholine receptor (AChR). The majority of patients are affected by ptosis, ophthalmoplegia, dysarthria and dysphasia. Treatment is with cholinesterase inhibitors, and immunosuppression in severe cases.

Mechanical dysphagia (for example, oesophageal and gastric carcinoma, oesophageal stricture, etc) causes dysphagia that is worse with solids than liquids. Nasal regurgitation and dysarthria are not usually accompanying features of mechanical dysphagia.

No abnormality would be expected on chest x-ray, barium swallow or gastroscopy with myasthenia gravis, and tumour markers are not raised.

A number of you suggest achalasia could be the diagnosis in this case. However, achalasia typically affects solids more than liquids, or solids and liquids equally (rather than the opposite as in this case). It typically presents earlier than this (25-40y age). Chest pain is a predominant feature, and this level of weight loss is unusual.



[Q: 4090] OnExamination 2012 - Neurology

An 18-year-old female presents with a three day history of progressive weakness and numbness of her legs, urinary retention and back pain for two weeks following an upper respiratory infection.

On examination there is spastic paraparesis, sensory level up to T5, extensor plantars.

Examination of cranial nerves and upper limbs is normal. MRI of the spine is normal.

Of the following, which is the most likely diagnosis?

- 1- Anterior spinal artery occlusion
- 2- Guillain-Barre syndrome
- 3- Multiple sclerosis

- 4- Post-infectious transverse myelitis
5- Thoracic disc prolapse

Answer & Comments

Answer: 4- Post-infectious transverse myelitis

Transverse myelitis describes a heterogeneous group of conditions that are characterised by acute or subacute motor, sensory and autonomic spinal cord dysfunction. The clinical signs are caused by an interruption in ascending and descending pathways in the transverse plane of the spinal cord. A sensory level is characteristic. Midline or dermatomal neuropathic pain can be present. Urinary incontinence or retention, bowel incontinence or constipation, and sexual dysfunction are common but vary in severity. These signs develop over hours to days, and are usually bilateral.

There are a variety of causes, but it most often occurs as an autoimmune phenomenon after an infection or vaccination, or as a result of direct infection, an underlying systemic autoimmune disease, or an acquired demyelinating disease. For a significant proportion of cases no cause is found.

MRI is indicated to rule out the presence of structural lesions, and determine the presence of myelitis which enhances with gadolinium in the acute phase. There may be more than one area of myelitis, and the lesions usually span at least two vertebral segments. In the acute phase the MRI may be normal.

Treatment in the acute phase aims to halt the progression and initiate resolution of the inflammatory cord lesion. Corticosteroids are first line, and are initially given in high doses intravenously. Plasma exchange can be given to those who fail to respond. Patients with demyelinating disease can be started on long-term immunosuppression.

The prognosis is highly variable, and improvement can take three months and longer to develop. A rapidly progressive course, severe weakness, hypotonia and areflexia are predictors of poor prognosis. 50-70% of patients have partial or complete recovery.

Whilst multiple sclerosis may be a possible underlying cause in this young lady, the proximity to an infection and the lack of history of other neurological deficits makes it less likely.

Guillain-Barre syndrome presents with ascending progressive symmetrical weakness, with lower motor neurone signs.

Anterior spinal artery occlusion typically presents with a flaccid paraplegia or quadriplegia (depending on the level). It is usually associated with atherosclerosis or aortic dissection, and would therefore be unusual in this age group.

A thoracic disc prolapse would be seen on MRI.



[Q: 4091] OnExamination 2012 - Neurology

Which of the following is caused by a lesion of the frontal lobe?

- 1- Apraxia
- 2- Broca's (expressive) aphasia
- 3- Cortical blindness
- 4- Homonymous hemianopia
- 5- Visuospatial neglect

Answer & Comments

Answer: 2- Broca's (expressive) aphasia

Lesions of the frontal lobe include:

Difficulties with task sequencing and executive skills

Expressive aphasia (receptive aphasias and temporal lobe lesion)

Primitive reflexes

Perseveration (repeatedly asking the same question or performing the same task)

Anosmia

Changes in personality.

Lesions of the parietal lobe include:

Apraxias

Neglect

Astereognosis (unable to recognise an object by feeling it)

Visual field defects (typically homonymous inferior quadrantanopia).

They may also cause acalculia (inability to perform mental arithmetic).

Lesions of the temporal lobe cause:

Visual field defects (typically homonymous superior quadrantanopia)

Wernicke's (receptive) aphasia

Auditory agnosia

Memory impairment.

Occipital lobe lesions include:

Cortical blindness (blindness due to damage to the visual cortex and may present as Anton syndrome where there is blindness but the patient is unaware or denies blindness)

Homonymous hemianopia

Visual agnosia (seeing but not perceiving objects - it is different to neglect since in agnosia the objects are seen and followed but cannot be named).



[Q: 4092] OnExamination 2012 - Neurology

Which of the following may cause a downbeat

nystagmus?

1- Aqueduct stenosis

2- Benign paroxysmal vertigo

3- Central cerebellar lesion

4- Chiari type I malformation

5- Unilateral medial longitudinal fasciculus lesion

Answer & Comments

Answer: 4- Chiari type I malformation

Nystagmus is defined as involuntary oscillations of the eyes.

This may be pendular when the oscillations are equal in rate and amplitude, or jerking when there are quick and slow phases. (The quicker phase is used to define the direction.)

Nystagmus may be caused by:

Visual disturbances

Lesions of the labyrinth

The central vestibular connections

Brain stem or cerebellar lesions.

Pendular nystagmus is usually due to loss of macular vision, but may be seen in diffuse brain stem lesions.

Jerking nystagmus which is of constant direction regardless of the direction of gaze, suggests a labyrinthine or cerebellar lesion.

Nystagmus which changes with the direction of gaze suggests widespread central involvement of vestibular nuclei.

Jerking nystagmus presents only on lateral gaze, the fast component of which is in the direction of gaze and indicates a lesion of the brain stem or cerebellum.

Nystagmus confined to one eye suggests a peripheral lesion of the nerve or muscle, or a lesion of the medial longitudinal bundle.

Nystagmus restricted to the abducting eye on lateral gaze (ataxic nystagmus) is due to a lesion of the medial longitudinal bundle between the pons and mid-brain as in multiple sclerosis (MS).

Nystagmus occurring on upward gaze with the fast component upwards (upbeat nystagmus) may be due to a lesion in the mid-brain at the level of the superior colliculus.

Downbeat nystagmus (fast phase downwards) suggests a lesion in the lower part of the medulla. It is therefore typical of the Arnold-Chiari malformation.

Wernicke's encephalopathy is another rare cause.



[Q: 4093] OnExamination 2012 - Neurology

Which of the following associations of muscles and nerve supply are not true?

- 1- Deltoid and C5
- 2- Gastrocnemius and S1
- 3- Long flexors of fingers and C6
- 4- Quadriceps and L3
- 5- Triceps and C7

Answer & Comments

Answer: 3- Long flexors of fingers and C6

Finger flexors and extensors are supplied by C8.



[Q: 4094] OnExamination 2012 - Neurology

A 43-year-old gentleman has been brought to the Emergency department by his partner.

He was diagnosed with HIV infection 10 years ago and his CD4 count has been maintained on triple therapy.

He has recently been dismissed from work for poor performance. He has lost interest in

cooking and socialising over the past 10 months. There has been a slurring in his speech. His partner feels he has been more aggressive and withdrawn, however in the past few days he has started to have hallucinations.

What is the likely diagnosis?

- 1- Cryptococcal meningitis
- 2- HIV dementia
- 3- Progressive multifocal leukoencephalopathy
- 4- Schizophrenia
- 5- Toxoplasmosis

Answer & Comments

Answer: 2- HIV dementia

HIV infection can cause dementia that progresses over a longer time period than progressive multifocal leukoencephalopathy (PML). Symptoms are of:

Confusion

Depression

Reduced concentration

Behavioural changes

Psychosis

Speech and balance problems, as well as

Muscle weakness.

Patients with cryptococcal meningitis present with headache, fever, vomiting and few neurological signs.

PML can present at any CD4 count with ataxia, behavioural changes and focal neurological signs, often progressing over a period of months to paresis or even coma.

Toxoplasmosis presents with headache, fever and seizures. It has a typical CT head scan with ring enhancing lesions.

This patient's symptoms may be compatible with schizophrenia, however given his HIV status and neurology HIV dementia is more likely.



[Q: 4095] OnExamination 2012 - Neurology

A 58-year-old man presents with central back pain which shoots down to his left foot. There is paraesthesia over the lateral aspect of the left foot, impaired ankle jerk and weakness of plantarflexion. His right leg is normal.

What is the most likely cause of his pain?

- 1- Cervical disc prolapse
- 2- Cauda equina syndrome
- 3- L3/4 disc prolapse
- 4- L4/5 disc prolapse
- 5- L5/S1 disc prolapse

Answer & Comments

Answer: 5- L5/S1 disc prolapse

The L5/S1 disc can compress the S1 nerve root causing

Sciatic pain

Loss of plantarflexion

Impaired S1 reflex (ankle jerk) and

Paraesthesia over the lateral aspect of the foot.

Regarding the options:

A is incorrect as signs would be bilateral and involve paraplegia.

B is incorrect as there would be bilateral signs and bladder involvement.

C and D are incorrect as they involve the wrong spinal root.

E is correct as it is the S1 nerve root that is involved.



[Q: 4096] OnExamination 2012 - Neurology

A 45-year-old woman presents to the GP with loss of sensation over the lateral three and a half fingers of her right hand, tenderness over her right forearm and inability to make a tight fist.

She complains of pain in her right arm when twisting door handles anticlockwise. Phalen's and Tinel's tests are negative. She is otherwise neurologically intact.

What is the most likely diagnosis?

- 1- Carpal tunnel syndrome
- 2- Diabetic polyneuropathy
- 3- Multiple sclerosis
- 4- Pronator teres syndrome
- 5- Stroke

Answer & Comments

Answer: 4- Pronator teres syndrome

Entrapment of the median nerve by pronator teres causes a median nerve neuropathy, which is worse during pronation of the forearm.

Examination involves excluding carpal tunnel syndrome and pronation of the affected forearm against resistance, which brings on the pain. Unlike carpal tunnel syndrome, the median nerve proximal to the wrist may be tender to palpation.

Regarding the options:

A is incorrect as Tinel's and Phalen's tests are negative.

B is incorrect as diabetic neuropathies tend to be bilateral and affect the feet before the hands.

C is incorrect as there is a peripheral nerve lesion.

D is the correct answer as the median nerve is affected, and the pain is exacerbated by pronation.

E is incorrect as there is a peripheral not central nerve lesion.



[Q: 4097] OnExamination 2012 - Neurology

An old man presents to his GP with difficulty driving. He reports not seeing cars approaching from the right.

On examination he has a right inferior homonymous quadrantanopia.

What is the most likely diagnosis?

- 1- Right occipital lobe
- 2- Left parietal lobe
- 3- Right temporal lobe
- 4- Left optic tract
- 5- Optic chiasm

Answer & Comments

Answer: 2- Left parietal lobe

Lesions affecting the optic radiation cause a contralateral homonymous quadrantanopia.

The upper part of the visual field flows through the temporal lobe, whilst the inferior part flows through the parietal lobe. This can be remembered with the mnemonic, PITS - parietal inferior, temporal superior.

Lesions of the optic tract (before the lateral geniculate body) result in a contralateral homonymous hemianopia, whilst lesions of the optic chiasm cause a bitemporal hemianopia.

Regarding the options:

A is incorrect because it is ipsilateral and would cause a hemianopia.

B is correct as it is the contralateral optic radiation that causes homonymous quadrantanopia.

C is incorrect because it is ipsilateral and would cause a superior quadrantanopia.

D is incorrect because optic tract lesions cause hemianopsia.

E is incorrect because optic chiasm lesions cause bitemporal hemianopsia.



[Q: 4098] OnExamination 2012 - Neurology

A 64-year-old man presents to the hospital with bleeding. He has a heavy dependence on alcohol.

On examination he has petechiae and bleeding gums.

What is the likely vitamin deficiency?

- 1- B1
- 2- B12
- 3- C
- 4- E
- 5- K

Answer & Comments

Answer: 3- C

Alcoholics have malabsorption resulting in multiple possible vitamin deficiencies.

Deficiencies in:

B1 or thiamine can result in Wernicke's encephalopathy

Vitamin B₁₂ or cyanocobalamin can result in subacute degeneration of the spinal cord

Vitamin K can result in anticoagulant effects and elevated INR causing more profuse bleeding

Vitamin E deficiency can result in myopathies, neuropathies and red cell dyscrasias.



[Q: 4099] OnExamination 2012 -
Neurology

Which area supplied by the median nerve will be spared if the problem is at the carpal tunnel?

- 1- Hypothenar eminence
- 2- Lateral three digits
- 3- Medial two digits
- 4- Thenar eminence
- 5- Volar surface of the hand

Answer & Comments

Answer: 4- Thenar eminence

The hypothenar eminence is supplied by the ulnar nerve as are the volar surface and the medial two digits (the fourth and fifth digits, remember the dermatomal map has palms facing outwards).

The lateral three digits are supplied by the median nerve but are affected by carpal tunnel syndrome.



[Q: 4100] OnExamination 2012 -
Neurology

What is the likelihood of being seizure-free after a second or third antiepileptic in patients previously untreated for epilepsy?

- 1- 8%
- 2- 14%
- 3- 20%
- 4- 35%
- 5- 47%

Answer & Comments

Answer: 2- 14%

A study of patients with previously untreated epilepsy demonstrated that 47% achieved control of seizures with the use of their first single drug.

Fourteen per cent became seizure-free during treatment with a second or third drug.

An additional 3% became seizure-free with the use of two drugs simultaneously.

Birbeck GL, Hays RD, Cui X, Vickrey BG. (2002).

'Seizure reduction and quality of life improvements in people with epilepsy'.
Epilepsia 43 (5): 535-538



[Q: 4101] OnExamination 2012 -
Neurology

What is the mechanism of action of fingolimod?

- 1- Inhibits IL-2 transcription
- 2- Ceramide synthase inhibitor
- 3- Interferon agonist
- 4- Monoclonal antibody to anti-alpha 4 integrin
- 5- Shifts Th1 cell to Th2 cell populations

Answer & Comments

Answer: 2- Ceramide synthase inhibitor

Fingolimod is a new agent for multiple sclerosis. Its primary mode of action is its activity at the sphingosine-1-phosphate receptor 1, but it has also been reported to be a cannabinoid receptor antagonist as well as a ceramide synthase inhibitor. It is an immunomodulator, which sequesters lymphocytes in lymph nodes. It has been shown to reduce the rate of relapses in relapsing-remitting MS by over half.

IFN beta-1 is used in multiple sclerosis.

Glatiramer acts to shift the T cell population from a pro-inflammatory to a regulatory state, and is also used in MS.

Cyclosporin inhibits IL-2 transcription, and is an immunomodulator used in a number of conditions (including transplants).

Natalizumab is a monoclonal antibody to alpha-4 integrin. It can be used in the treatment of multiple sclerosis.



[Q: 4102] OnExamination 2012 - Neurology

You are asked to review a 32-year-old woman on the labour ward.

She has just given birth to a healthy female child and was recovering on the ward when the midwives noticed a deterioration in her conscious level and a grand mal seizure which was self-terminating after about five minutes.

A few minutes before the seizure they said that she had increasing problems with nausea, vomiting and a severe frontal headache. Apparently there was a short period of hypotension associated with the delivery.

On examination she is drowsy with a GCS of 12, her BP is 145/91 mmHg. She has bilateral papilloedema and appears to have bilateral third nerve palsies.

Investigations show

Haemoglobin 11.1 g/dl(11.5-16.5)

White cell count $5.2 \times 10^9/L$ (4-11)

Platelets $180 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 4.2 mmol/l (3.5-5)

Creatinine 88 $\mu\text{mol/l}$ (79-118)

Which of the following is the most likely diagnosis?

- 1- Cerebral venous thrombosis
- 2- Embolic stroke
- 3- Idiopathic epilepsy
- 4- Migraine
- 5- Subarachnoid haemorrhage

Answer & Comments

Answer: 1- Cerebral venous thrombosis

This woman's symptoms, the onset of which has occurred a few hours after the birth of her child, are suggestive of cerebral venous thrombosis.

A number of conditions predispose to the condition, including

Pregnancy and use of the oral contraceptive pill

Inherited coagulation disorders

Collagen vascular disease.

Signs and symptoms may vary from headache, nausea and vomiting, to a progressive reduction in conscious level and eventual coma.

Magnetic resonance venography is extremely valuable in confirming the diagnosis.

Anti-coagulation is the treatment of choice.



[Q: 4103] OnExamination 2012 - Neurology

In herpes simplex encephalitis which of the following statements is correct?

- 1- Brain magnetic resonance imaging (MRI) is characteristically normal
- 2- Cold sores or genital herpes are usually present
- 3- Fits are uncommon
- 4- Temporal lobe involvement is common
- 5- Viral identification by polymerase chain reaction (PCR) on cerebrospinal fluid (CSF) is non-specific

Answer & Comments

Answer: 4- Temporal lobe involvement is common

MRI brain normally shows changes in the temporal lobes.

Presenting features include fever, headache, vomiting, reduced consciousness and seizures.

There may be dysphasia, hallucinations and peculiar behaviour.

There are usually no skin manifestations of herpes simplex infections.

The virus is rarely isolated from CSF but may be detected by PCR.



[Q: 4104] OnExamination 2012 - Neurology

A 17-year-old female presents with three headaches over a six month period.

She describes the headaches as severe, right-sided and lasting for twelve hours and associated with nausea and photophobia. Each is preceded by spots before her eyes.

What is the most appropriate initial treatment for this patient?

- 1- Diclofenac at the onset of the next attack
- 2- Ergotamine suppository at the onset of the next attack
- 3- Paracetamol plus metoclopramide at the onset of the next attack
- 4- Prophylaxis with propranolol
- 5- Sumatriptan at the onset of the next attack

Answer & Comments

Answer: 3- Paracetamol plus metoclopramide at the onset of the next attack

First line treatment of acute migraine consists of simple analgesic (either soluble paracetamol or aspirin) and an antiemetic (usually domperidone or metoclopramide).

Second line treatment includes the use of non-steroidal anti-inflammatory drugs such as diclofenac.

If the above measures fail to alleviate the attacks, then triptan therapy (for example, sumatriptan) is indicated.

It is important for patients to take the treatment as early as possible.

Long term prophylaxis with drugs (for example, propranolol) is indicated only if the attacks are frequent (more than two a month).



[Q: 4105] OnExamination 2012 - Neurology

A 40-year-old woman presents with fatigue.

She has a six month history of secondary amenorrhoea and galactorrhoea.

Examination shows an obese lady with a BMI of 36 kg/m². Neurological examination is normal.

A prolactin is measured at 3124 mU/L (normal <550mU/L) and thyroid function tests reveal a Free T₄ of 7.5 nmol/l and a TSH of 120 mU/l. A CT scan shows a bulky pituitary gland.

Which of the following is the likely diagnosis?

- 1- Cushing's syndrome
- 2- Hypothyroidism
- 3- Macroprolactinoma
- 4- Microprolactinoma
- 5- Type 2 diabetes

Answer & Comments

Answer: 2- Hypothyroidism

Hypothyroidism is not an uncommon cause of hyperprolactinaemia and should be part of the work up of all patients with an elevated prolactin.

The clinical scenario here would be consistent with a diagnosis of hypothyroidism.

Macroprolactin may masquerade as hyperprolactinaemia and most laboratories

now carry out this assay if requested in patients with hyperprolactinaemia. Cabergoline or bromocriptine should only be commenced if a macroprolactinoma is confirmed.

A bulky pituitary gland on CT scan is not a significant finding and an MRI of the pituitary is required to delineate the anatomy of the pituitary gland.

Bitemporal hemianopia would be a feature of a macroprolactinoma impinging on the optic chiasm.



[Q: 4106] OnExamination 2012 - Neurology

A 21-year-old man is admitted with severe acute onset headache.

He is disoriented and drowsy and has neck stiffness. Investigations suggest a diagnosis of subarachnoid haemorrhage (SAH).

What grade of SAH does this patient have based on the Hunt & Hess classification?

- 1- Grade three
- 2- Grade one
- 3- Grade two
- 4- Grade four
- 5- Grade five

Answer & Comments

Answer: 1- Grade three

This gentleman's history is suggestive of subarachnoid haemorrhage (SAH). The Hunt and Hess scale grades SAH thus:

1. Asymptomatic or minimal headache, plus slight neck stiffness.
2. Moderate or severe headache with neck stiffness, but no neurological deficit other than cranial nerve palsy.
3. Drowsiness with confusion or mild focal neurology.

4. Stupor with moderate to severe hemiparesis or mild decerebrate rigidity.

5. Deeply comatose with severe decerebrate rigidity.

Severity and mortality increase with grade.



[Q: 4107] OnExamination 2012 - Neurology

A 65-year-old man presents with unsteadiness, rigidity of movement and tremor of the right hand.

Which of the following features most strongly suggest idiopathic Parkinson's disease?

- 1- Intention tremor
- 2- Slowness of the movement
- 3- The asymmetry of tremor
- 4- Titubation
- 5- Tremor that disappears when he sleeps

Answer & Comments

Answer: 3- The asymmetry of tremor

Asymmetry and resting tremor are more common in idiopathic Parkinson's disease than other parkinsonian syndromes.

Intention tremor is seen in cerebellar diseases.



[Q: 4108] OnExamination 2012 - Neurology

A 65-year-old male presents with bilateral leg pain.

There is no relevant past medical history, and no excess alcohol use. Both knee reflexes are reduced.

Fasting glucose is 6.5 mmol/L.

Which is the next investigation most likely to confirm the diagnosis?

- 1- B12 and folate
- 2- Chest x ray

- 3- CSF examination
- 4- MRI spine
- 5- Oral glucose tolerance test

Answer & Comments

Answer: 5- Oral glucose tolerance test

The suggestion of bilateral leg pain, weakness and reduced knee reflexes with an impaired fasting glucose concentration suggests a diagnosis of diabetic amyotrophy. This is confirmed with a formal OGTT.

Diabetic amyotrophy is not uncommonly a presenting feature of diabetes in the elderly. The features are of an asymmetrical but bilateral quadriceps wasting and weakness with diminished reflexes.



[Q: 4109] OnExamination 2012 - Neurology

A 30-year-old female was commenced on carbamazepine for partial complex seizures and was also advised to discontinue her moderate alcohol consumption.

Therapeutic concentrations of carbamazepine were achieved within four days with a dose of 200 mg daily but the dose needed to be increased to 400 mg daily within two weeks to achieve a therapeutic plasma concentration.

Which one of the following is likely to account for this observation?

- 1- Auto-induction of carbamazepine metabolism
- 2- Auto-inhibition of carbamazepine metabolism
- 3- Cessation of alcohol intake
- 4- Concomitant prescription of the oral contraceptive pill
- 5- Reduced bioavailability of carbamazepine

Answer & Comments

Answer: 1- Auto-induction of carbamazepine metabolism

Alcohol is a liver enzyme inducer therefore stopping the alcohol should increase the activity of the carbamazepine not reduce its activity.

It is well recognised that carbamazepine is a P450 enzyme inducer but it is less well appreciated that it causes auto-induction and so would require increase in dose to maintain the same therapeutic concentration.



[Q: 4110] OnExamination 2012 - Neurology

A 15-year-old girl presents with a two week history of headaches and double vision. She had also noticed an episode where her vision dimmed after sneezing.

On examination her BMI was 32.4 kg/m², she had bilateral optic disc swelling and a partial left sixth cranial nerve palsy was present.

What is the most likely diagnosis?

- 1- Benign intracranial hypertension
- 2- Graves' ophthalmopathy
- 3- Multiple sclerosis
- 4- Pituitary tumour
- 5- Sagittal vein thrombosis

Answer & Comments

Answer: 1- Benign intracranial hypertension

This patient has the features of benign intracranial hypertension which may be associated with reduction of vision with manoeuvres that raise intracranial pressure and is associated with sixth nerve palsies.

There are no features to suggest Graves' ophthalmopathy nor multiple sclerosis.

A pituitary tumour would be likely to produce visual field constriction which is not mentioned in this history.

A sagittal vein thrombosis is a potential differential diagnosis here but is less likely than BIH.



[Q: 4111] OnExamination 2012 - Neurology

An 18-year-old female presents 12 weeks into an unplanned pregnancy.

She had been diagnosed with epilepsy six years ago which was well controlled on sodium valproate and had been taking the combined oral contraceptive pill for three years.

Which of the following is correct concerning this patient?

- 1- Lamotrigine should be substituted for sodium valproate
- 2- She should be advised to have a termination of her pregnancy.
- 3- Sodium valproate interaction with the oral contraceptive increased the risk of pregnancy.
- 4- The dose of sodium valproate should be increased.
- 5- There is an increased risk of a neural tube defect in her fetus.

Answer & Comments

Answer: 5- There is an increased risk of a neural tube defect in her fetus.

This patient has become pregnant on valproate. This therapy has controlled her seizures and should not be changed now.

However, there is an increased risk of neural tube defects associated with valproate and this could be reduced by folate therapy.

Valproate is not an enzyme inducer and unlike other anticonvulsants would not speed up metabolism of the OCP.

It is entirely up to the individual whether she wishes to pursue the pregnancy or not.



[Q: 4112] OnExamination 2012 - Neurology

A 25-year-old male presents to casualty with weakness of his right hand.

Examination reveals weakness of right wrist and finger extension.

What is the most likely diagnosis?

- 1- Axillary nerve palsy
- 2- C8 nerve root lesion
- 3- Proximal median nerve lesion
- 4- Radial nerve lesion
- 5- Ulnar nerve lesion at the elbow

Answer & Comments

Answer: 4- Radial nerve lesion

Weakness of wrist extension with wrist drop and weakness of finger extension are typical of a radial nerve lesion.



[Q: 4113] OnExamination 2012 - Neurology

A 48-year-old female patient develops an acute, severe and isolated right C6 radiculopathy affecting both the motor and sensory roots.

She is examined in an EMG clinic three weeks after the onset of symptoms.

Which of the following statements is true?

- 1- Absent sensory nerve potentials would be expected on examination of the thumb and index finger on the right.
- 2- A repeat examination 12 months later is likely to reveal rapidly recruited low

amplitude short duration motor units in the clinically involved muscle on EMG.

- 3- Fibrillation potentials would be expected in the right extensor carpi ulnaris and extensor pollicis brevis.
- 4- Triceps tendon jerk is likely to be depressed or absent.
- 5- Voluntary motor unit activity may be absent in the right biceps.

Answer & Comments

Answer:



[Q: 4114] OnExamination 2012 - Neurology

A 48-year-old man presented with a two week history of recurrent severe right-sided peri-orbital headache, frequently nocturnal and occurring at least once daily, usually lasting an hour.

He had noticed lacrimation from the right eye and blockage of the right nostril during the headache.

At the time of the examination he was free from headache and there were no abnormal physical signs.

Which of the following is the most likely diagnosis?

- 1- Cluster headache
- 2- Intracranial aneurysm
- 3- Orbital pseudotumour
- 4- Right maxillary sinusitis
- 5- Trigeminal neuralgia

Answer & Comments

Answer: 1- Cluster headache

Cluster headaches are more common in men (M:F 10:1).

They usually present nocturnally (early morning).

They are paroxysmal (occur in clusters).

They are associated with autonomic symptoms:

Lacrimation

Ptosis

Pupil constriction

Nasal congestion

Redness of eye

Swelling of eyelid.

Examination between the attacks should be normal.



[Q: 4115] OnExamination 2012 - Neurology

A 57-year-old woman is referred to the clinic with progressive hearing loss affecting her left ear and tinnitus.

She had been diagnosed with Meniere's disease some two years earlier and feels that her problems are slowly getting worse with vertigo and double vision recent additional features.

Her GP prescribed some betahistine but it does not seem to be working.

On examination her BP is 134/72 mmHg, pulse is 70 and regular, her BMI is 29.

There is coarse nystagmus when she looks towards the left, nystagmus is rapid when she looks to the right. There is a deficient corneal reflex on the left. Audiometry reveals significant sensorineural hearing loss affecting the left side.

Which of the following is the most appropriate next intervention?

- 1- Added cyclizine
- 2- CT brain
- 3- Increased dose of betahistine
- 4- MRI brain
- 5- Referral for Hallpike manoeuvre

Answer & Comments

Answer: 4- MRI brain

The pattern of nystagmus, slowly progressive symptoms of hearing loss, tinnitus, and loss of corneal reflex fits best with a diagnosis of acoustic neuroma. As such an MRI brain is the investigation of choice.

There is no role for increased medical therapy, betahistine or cyclizine in the management of acoustic neuroma. As such neither of those options is appropriate.

CT is not as sensitive as MRI for detection of acoustic neuroma, whereas MRI can detect tumours as small as 1-2 mm, tumours as large as 1.5 cm have been missed on CT.

The Hallpike manoeuvre is considered in the diagnosis of benign positional vertigo.



[Q: 4116] OnExamination 2012 - Neurology

Which of the following is true regarding cerebral palsy?

- 1- Epilepsy is present in 40%.
- 2- Hearing loss is present in 5%.
- 3- Learning impairment is present in 30%.
- 4- The incidence is 2 per 100 live births.
- 5- Visual impairment occurs in 50%.

Answer & Comments

Answer: 1- Epilepsy is present in 40%.

Cerebral palsy is a disorder of movement and posture due to a non-progressive lesion of the motor pathways in the developing brain.

The clinical manifestations tend to evolve with age. The incidence is 2 per 1000 live births, and other problems are common and reflect more widespread damage to the brain.

These include:

Learning impairment in 60%

Epilepsy in 40%

Squints in 30%

Hearing loss and visual impairment in 20%

Speech and language disorders.

In addition, there may be considerable behavioural problems.



[Q: 4117] OnExamination 2012 - Neurology

The action of noradrenaline (NA) released at sympathetic nerve endings is terminated by which of the following?

- 1- Enzymatic decarboxylation
- 2- Enzymatic inactivation by catechol-O-methyl transferase
- 3- Oxidative deamination by monoamine oxidase
- 4- Removal by the circulating blood
- 5- Re-uptake of noradrenaline by the axonal terminals

Answer & Comments

Answer: 5- Re-uptake of noradrenaline by the axonal terminals

A popular question for the examination but simple physiology gets the right answer here.

The effects of neurotransmitter release are principally terminated by neuronal uptake.

Intraneuronal NA is usually taken back up into the neurosecretory granules and a small amount is metabolised by monoamine oxidase (MAO).

Even smaller quantities that escape into the circulation are metabolised by catechol-O-methyltransferase (COMT).



[Q: 4118] OnExamination 2012 - Neurology

A 15-year-old boy presents with tremor of

both hands.

Over the previous months he has developed a mild dysarthria. He has a history of behavioural problems, of a depressive / psychotic nature.

Which of the following is the most likely diagnosis?

- 1- Alzheimer's disease
- 2- Huntington's disease
- 3- Neuroacanthocytosis
- 4- Variant Creutzfeldt-Jakob disease
- 5- Wilson's disease

Answer & Comments

Answer: 5- Wilson's disease

Wilson's disease is a rare disorder of copper metabolism which is inherited as an autosomal recessive disease.

It is associated with:

Extrapyramidal features (tremor, parkinsonism, dystonia)

Dysarthria

Psychiatric features

Cirrhosis

A deposit of brownish-green pigment around the margin of the cornea (Kayser-Fleischer ring).

Variant Creutzfeldt-Jakob disease is characterised by myoclonus and rapid onset dementia.



[Q: 4119] OnExamination 2012 - Neurology

A 50-year-old old man is admitted to hospital unconscious, and smelling of alcohol.

One hour after admission, he becomes suddenly sweaty with a regular tachycardia of 110 bpm and a BP of 100/50 mmHg.

What is the diagnosis?

- 1- Alcohol withdrawal.
- 2- Hepatic encephalopathy.
- 3- Hypoglycaemia.
- 4- Subdural haematoma.
- 5- Wernicke's encephalopathy.

Answer & Comments

Answer: 3- Hypoglycaemia.

This is a bit early for alcohol withdrawal particularly as the patient is admitted smelling of alcohol.

The most likely diagnosis is hypoglycaemia.

We do not have any clinical findings to suggest any of the other alternatives.



[Q: 4120] OnExamination 2012 - Neurology

A 36-year-old man has a three month history of pain in his feet and lower legs. He was diagnosed as having diabetes at age 14 and treated with insulin. He is a cannabis smoker and drinks 30 units of alcohol per week.

On examination he has impaired pain and temperature sensation in feet and lower legs, normal joint position and vibration sense. His reflexes are normal.

What is the diagnosis?

- 1- Alcoholic polyneuropathy.
- 2- Chronic inflammatory demyelinating polyneuropathy (CIDP)
- 3- Diabetic polyneuropathy.
- 4- Syringomyelia.
- 5- Vitamin B₁₂ deficiency.

Answer & Comments

Answer: 3- Diabetic polyneuropathy.

The history suggests small fibre painful peripheral sensory neuropathy. The

commonest cause is diabetes. Joint position sense and vibration are carried through large fibres, and are therefore affected later. Sensory nerves are affected more than motor so often reflexes remain intact.

Vitamin B₁₂ deficiency causes impairment of joint position and vibration. Chronic inflammatory demyelinating polyneuropathy (CIDP) causes a large fibre peripheral neuropathy with areflexia.

In syringomyelia you have impaired pain and temperature in the upper limbs.

Typically with alcoholic polyneuropathy all fibre types are affected and it is seen with a higher alcohol consumption than 30 units. Pain is usually a more dominant feature. It should definitely feature as part of the differential diagnosis.



[Q: 4121] OnExamination 2012 - Neurology

A 50-year-old woman presented to her GP with a four month history of progressive distal sensory loss and weakness of both legs and arms. The weakness and numbness had extended to the elbows and knees. She had great difficulty in fine manipulation and had become unsteady on her feet. She had osteoarthritis in her neck, but did not take any regular medication. She was a non-smoker and did not drink any alcohol. There was no family history of any neurological disease.

On examination, cranial nerves and fundoscopy were normal. Examination of the upper limb revealed bilaterally reduced tone at the elbows and wrists with absent biceps, triceps and supinator jerks. There was mild weakness of shoulder abduction and adduction 4/5 with marked weakness of handgrip and elbow flexion, extension 3/5.

Sensory examination revealed reduced pinprick sensation extending from the hand to the elbow and vibration was felt at the

elbow. Lower limb examination revealed some mild weakness of hip flexion and extension with marked weakness of dorsiflexion and plantarflexion. Both knee and ankle jerks were absent and both plantar responses were mute. There was absent sensation to all modalities affecting both feet extending to the knees.

A lumbar puncture was performed and yielded the following data:

Opening pressure 14 cm H₂O (5-18)

CSF protein 0.75 g/L (0.15-0.45)

CSF white cell count 10 cells per ml (<5 cells)

CSF white cell differential 90% lymphocytes

CSF red cell count 2 cells per ml (<5 cells)

Nerve conduction studies showed multifocal motor and sensory conduction block with prolonged distal latencies.

What is the likely diagnosis in this patient?

- 1- Cervical spondylosis
- 2- Chronic inflammatory demyelinating neuropathy (CIDP)
- 3- Guillain-Barré syndrome
- 4- Hereditary motor and sensory neuropathy (HMSN)
- 5- Multifocal motor neuropathy

Answer & Comments

Answer: 2- Chronic inflammatory demyelinating neuropathy (CIDP)

The history is compatible with a subacute sensory and motor peripheral neuropathy.

Causes of such conditions include inflammatory neuropathies such as CIDP chronic inflammatory demyelinating polyneuropathy (CIDP) and paraproteinaemic neuropathies.

CIDP is characterised by progressive weakness and impaired sensory function in the upper and lower limbs. The cause of the

demyelination is not understood, but it is more common in young adults and in men. It presents with abnormal sensation (which typically begins distally), weakness of the limbs, areflexia and fatigue.

Treatment for CIDP includes corticosteroids, plasmapheresis and intravenous immunoglobulin. Physiotherapy is an effective adjunct. The course varies widely, and patients may be left with residual neurology or suffer a number of relapses.

Guillain-Barre syndrome (GBS) is an acute post-infectious neuropathy, thought possibly to be a post-infectious phenomenon, which reaches its peak in severity within six weeks. CIDP is closely linked to GBS, and is thought by some to be its chronic counterpart. Both CIDP and GBS can affect motor and sensory nerves, and it is the four month history which distinguishes the two here.

Cervical spondylosis would cause upper motor neurone signs such as hyperreflexia, extensor plantar response and possibly a sensory level.

HMSN is normally a very chronic neuropathy developing over many years and usually with a family history of the condition.

Multifocal motor neuropathy is a treatable neuropathy affecting motor conduction only. It is associated with antibodies to a ganglioside component of peripheral myelin.



[Q: 4122] OnExamination 2012 - Neurology

A 19-year-old girl presents at the antenatal clinic.

She is approximately six weeks pregnant and the pregnancy was unplanned. She has a two year history of grand mal epilepsy for which she takes carbamazepine. She has had no fits for approximately six months. She wants to continue with her pregnancy if it is safe to do so.

She is worried about the anticonvulsant therapy and its effects on the baby. She asks how she should be managed.

Which of the following management plans is the most appropriate in this case?

- 1- Advise termination due to drug teratogenicity
- 2- Continue with carbamazepine
- 3- Stop carbamazepine until the second trimester
- 4- Switch therapy to phenytoin
- 5- Switch therapy to sodium valproate

Answer & Comments

Answer: 2- Continue with carbamazepine

The patient and fetus are at far more risk from uncontrolled seizures than from any potential teratogenic effect of the therapy.

In pregnancy total plasma concentrations of anticonvulsants fall, so the dose may need to be increased.

The potential teratogenic effects (particularly neural tube defects) of carbamazepine do need to be explained and in an effort to reduce this risk she should receive folate supplements.

Screening with alpha fetoprotein (AFP) and second trimester ultrasound are required. Vitamin K should be given to the mother prior to delivery.

There is no point in switching therapies as this could precipitate seizures in an otherwise stable patient.

Similarly both phenytoin and valproate are associated with teratogenic effects. (



[Q: 4123] OnExamination 2012 - Neurology

A 19-year-old girl presents at the antenatal clinic.

She is approximately six weeks pregnant and the pregnancy was unplanned. She has a two year history of grand mal epilepsy for which she takes carbamazepine. She has had no fits for approximately six months. She wants to continue with her pregnancy if it is safe to do so.

She is worried about the anticonvulsant therapy and its effects on the baby. She asks how she should be managed.

Which of the following management plans is the most appropriate in this case?

- 1- Advise termination due to drug teratogenicity
- 2- Continue with carbamazepine
- 3- Stop carbamazepine until the second trimester
- 4- Switch therapy to phenytoin
- 5- Switch therapy to sodium valproate

Answer & Comments

Answer: 2- Continue with carbamazepine

The patient and fetus are at far more risk from uncontrolled seizures than from any potential teratogenic effect of the therapy.

In pregnancy total plasma concentrations of anticonvulsants fall, so the dose may need to be increased.

The potential teratogenic effects (particularly neural tube defects) of carbamazepine do need to be explained and in an effort to reduce this risk she should receive folate supplements.

Screening with alpha fetoprotein (AFP) and second trimester ultrasound are required. Vitamin K should be given to the mother prior to delivery.

There is no point in switching therapies as this could precipitate seizures in an otherwise stable patient.

Similarly both phenytoin and valproate are associated with teratogenic effects. (



[Q: 4124] OnExamination 2012 - Neurology

Frontal lobe brain damage is associated with which of the following?

- 1- Astereognosis
- 2- Auditory agnosia
- 3- Dressing apraxia
- 4- Focal epileptic fits
- 5- Perseveration

Answer & Comments

Answer: 5- Perseveration

Frontal lobe brain damage is classically associated with personality change and deterioration in intellect, but perseveration may also occur.

The lesion for astereognosis and acalculia would be in the parietal lobe and dressing apraxia in the non-dominant parietal lobe.

Focal epileptic fits and auditory agnosia are characteristically associated with temporal lobe damage.

Apraxia may result from lesions in the temporoparietal cortex, dominant frontal cortex and corpus callosum.



[Q: 4125] OnExamination 2012 - Neurology

A 25-year-old female presents with a two day history of diplopia and unsteadiness.

Two weeks ago she suffered an upper respiratory tract infection.

On examination there is complete ophthalmoplegia, areflexia and gait ataxia.

Which of the following blood tests is the most likely to confirm the underlying diagnosis?

- 1- Acetylcholine receptors antibodies

- 2- Anti GM1 antibodies
- 3- Anti GQ1b antibodies
- 4- Anti-Hu antibodies
- 5- Anti-Purkinje cell antibodies

Answer & Comments

Answer: 3- Anti GQ1b antibodies

The most likely diagnosis is Miller Fisher syndrome (variant of Guillain-Barre syndrome). It consists of complete or partial ophthalmoplegia, areflexia and ataxia. It usually follows antecedent infections. Serum IgG antibody to the ganglioside GQ1b is present in more than 95% of patients. It is highly specific for the syndrome.

Elevated levels of antibodies to the glycolipid ganglioside-monosialic acid (GM1 antibodies) have been shown in some instances to be associated with certain neurological disorders:

Lower motor neuron syndromes

Amyotrophic lateral sclerosis

Multiple sclerosis

Other multifocal neuropathies and

Systemic lupus erythematosus (SLE) with central nervous system involvement.

Neuronal nuclear (Hu) antibodies (NNA) are found in a number of paraneoplastic syndromes, including

Subacute sensory neuronopathy

Paraneoplastic encephalomyelitis and

Paraneoplastic cerebellar degeneration

and are associated with small cell lung carcinoma.

Purkinje cell cytoplasmic antibodies are useful for identifying individuals with subacute cerebellar degeneration or peripheral

neuropathy due to a remote (autoimmune) effect of gynecologic or breast carcinoma.



[Q: 4126] OnExamination 2012 - Neurology

A 50-year-old man presented with 18 months history of paraesthesia of his feet and hands.

On examination there is numbness of glove and stocking distribution with generalised hyporeflexia. Nerve conduction studies revealed demyelinating sensory polyneuropathy.

Which of the following conditions is the most likely diagnosis?

- 1- Alcohol abuse
- 2- Chronic inflammatory demyelinating polyneuropathy
- 3- Diabetes
- 4- Vasculitis
- 5- Vitamin B₁₂ deficiency

Answer & Comments

Answer: 2- Chronic inflammatory demyelinating polyneuropathy

Causes of demyelinating polyneuropathy include

Guillain-Barre syndrome

Chronic inflammatory demyelinating polyneuropathy (CIDP)

Paraproteinaemia

Hereditary motor sensory neuropathy

Refsum's disease

HIV infection

Amiodarone.

Causes of axonal polyneuropathy are

Alcohol abuse

Diabetes

Vasculitis

Vitamin deficiencies.

The difference here is between demyelinating and axonal neuropathies.



[Q: 4127] OnExamination 2012 - Neurology

A 68-year-old man presents with progressive visual impairment. On examination there is an incongruous homonymous hemianopia.

What is the most likely anatomical site of the neurological lesion?

- 1- Chiasma
- 2- Occipital lobe
- 3- Optic nerve
- 4- Optic radiation
- 5- Optic tract

Answer & Comments

Answer: 5- Optic tract

Causes of optic neuropathy:

A central scotoma

An optic tract lesion

An incongruous homonymous hemianopia

A chiasmal lesion

A bitemporal hemianopia

An optic radiation and occipital lobe lesion

A congruous homonymous hemianopia.

More on field defects



[Q: 4128] OnExamination 2012 - Neurology

A 35-year-old man has wrist drop of his right hand.

Examination reveals a small area of sensory loss on the dorsum of the hand.

Which of the following nerves is likely to be involved?

- 1- Long thoracic nerve
- 2- Median nerve
- 3- Radial nerve
- 4- T1 nerve root
- 5- Ulnar nerve

Answer & Comments

Answer: 3- Radial nerve

This is a typical radial nerve palsy.



[Q: 4129] OnExamination 2012 - Neurology

A 35-year-old woman was admitted to the Emergency department six months ago with urinary retention. She was catheterised and discharged the same day having recovered function.

She now is suffering with sudden onset blurred vision and pain on looking upwards. She works in an agrochemical laboratory. She takes no medication. There is a family history of breast cancer.

What test is likely to confirm diagnosis?

- 1- Ceruloplasmin level
- 2- CT brain
- 3- Lumbar puncture
- 4- MRI brain
- 5- Organophosphate level

Answer & Comments

Answer: 4- MRI brain

This woman is likely to have multiple sclerosis (MS) given that she has had two neuropathies separated in time and space.

MRI is the gold standard for diagnosing MS, when periventricular white matter plaques of

different ages and in different locations should be seen.

CT brain will not show these changes.

LP should show oligoclonal bands (immunoglobulins within CSF). These can be seen in MS as well as systemic lupus erythematosus (SLE), Lyme disease, neurosarcoidosis, Guillain-Barre syndrome and others.

Ceruloplasmin levels are used to diagnose Wilson's disease.

Organophosphate levels could be used if poison is suspected, but her symptoms would be very different with salivation, bradycardia, bronchospasm and urination, diarrhoea and miosis.



[Q: 4130] OnExamination 2012 - Neurology

A 19-year-old woman presents to the Emergency department with a severe headache, vomiting and right hemiplegia. She has recently begun the progesterone only pill, but has no other past medical history of note.

On examination her blood pressure is 155/80 mmHg, her pulse is 80 and regular and she is in obvious pain. There is a 3/5 power weakness affecting both her right upper and lower limb. Her reflexes are normal.

Investigations show:

Haemoglobin 12.0 g/dl(11.5-16.0)

White cell count $6.1 \times 10^9/L$ (4-11)

Platelets $241 \times 10^9/L$ (150-400)

ESR 9 mm/hr(<10)

Sodium 139 mmol/l (135-146)

Potassium 4.0 mmol/l (3.5-5)

Creatinine 82 $\mu\text{mol/l}$ (79-118)

MRI brain normal

Which of the following is the most appropriate treatment for her?

1- Acetazolamide

2- Diclofenac

3- Ergotamine

4- Sumatriptan

5- Zolmitriptan

Answer & Comments

Answer: 2- Diclofenac

Ergot derived compounds and triptans are contraindicated for the treatment of hemiplegic migraine because of the risk of precipitating a stroke.

Whilst acetazolamide has found favour as a treatment for hemiplegic migraine, data are unconvincing.



[Q: 4131] OnExamination 2012 - Neurology

A 54-year-old man being seen in the neurology clinic for a tremor is noted to have a shuffling gait.

Examination reveals difficulty with vertical gaze and an AMTS of 6/10.

What is the most likely diagnosis?

1- Corticobasal degeneration

2- Idiopathic benign essential tremor

3- Parkinson's disease

4- Progressive supranuclear palsy (PSP)

5- Wilson's disease

Answer & Comments

Answer: 4- Progressive supranuclear palsy (PSP)

Progressive supranuclear palsy is characterised by features of parkinsonism, difficulty with vertical gaze due to supranuclear paralysis of upward and downward gaze and cognitive impairment. It is also known as Steele-Richardson-Olszewski

syndrome, is progressive like Parkinson's disease, but does not respond to L-dopa.

Regarding the options:

A is incorrect as it does not cause vertical gaze disturbance.

B is incorrect as there is more than a tremor.

C is incorrect as there is more than parkinsonism.

D is correct as the triad of parkinsonism, vertical gaze palsy and cognitive impairment suggests PSP.

E is incorrect as vertical gaze is affected.



[Q: 4132] OnExamination 2012 - Neurology

A 40-year-old patient is being evaluated in your clinic for headaches.

On examination you notice that the left pupil constricts and then enlarges and constricts again while shining the pen torch on the eye.

What is this finding called?

- 1- Hippus
- 2- Horner's pupil
- 3- Iridocyclitis
- 4- Relative afferent papillary defect
- 5- Tonic pupil

Answer & Comments

Answer: 1- Hippus

Hippus is papillary athetosis. It is typically a benign finding. It is a spasmodic rhythmical dilation and contraction of the pupil. It is particularly noticeable when pupils are tested with a light, but is independent of eye movements or light. Pathological hippus is rare but is recognised with aconite poisoning, trauma, cirrhosis and renal disease (possibly due to frontal lobe dysfunction).

Iridocyclitis is inflammation of the uvea and is a form of anterior uveitis.

A relative afferent papillary defect is detected with the swinging light test, however in this case the pen torch is held on one eye only.

A Horner's pupil is a miotic pupil caused by damage to the sympathetic chain.

A tonic pupil or Holmes-Adie pupil is a dilated pupil caused by parasympathetic damage.



[Q: 4133] OnExamination 2012 - Neurology

A 55-year-old man presents with neck pain.

One week previously he had attended for a sigmoidoscopy and was given intravenous sedation during this procedure. One day prior to admission his neck and shoulders had become stiff.

On examination, the temperature was 38.0°C, blood pressure was 100/60 mmHg and heart rate 100 bpm.

There were absent biceps jerks and weakness of trapezius, deltoid and triceps bilaterally. The cranial nerves and lower limbs were normal.

There was a soft systolic murmur, and the chest was clear.

Which examination is likely to confirm the diagnosis?

- 1- Cervical spine X-ray
- 2- CT head
- 3- Echocardiography
- 4- Lumbar puncture
- 5- MRI neck

Answer & Comments

Answer: 5- MRI neck

The features suggest a paraspinal abscess affecting C4-C6 given the neurological findings.

The investigation of the patient should include all of the above tests.

Paraspinal abscess is often associated with infection in an intravenous (IV) line, which may or may not be apparent as cellulites.

Neurological signs, once apparent, should lead to rapid investigation as once they are present recovery of strength may be slow, or not at all.

A magnetic resonance imaging (MRI) of the neck should delineate the anatomy of the abscess, which will not be seen on a computerised tomography (CT) scan of the head.

However, given that these lesions are usually due to seeding of *Staphylococcus aureus*, endocarditis is a possibility.

Cerebral spinal fluid (CSF) should show an elevated protein with raised white cells, and a low/normal glucose.



[Q: 4134] OnExamination 2012 - Neurology

Which one of the following statements is correct?

- 1- The abducens nerve supplies the lacrimal gland
- 2- The facial nerve supplies the parotid salivary gland
- 3- The oculomotor nerve supplies the dilator pupillae muscle
- 4- The trochlear nerve supplies the superior rectus muscle
- 5- The vagus nerve supplies the palatal muscles

Answer & Comments

Answer: 5- The vagus nerve supplies the palatal muscles

The lacrimal gland is supplied by the facial nerve.

The glossopharyngeal nerve supplies the parotid salivary gland controlling salivary secretions.

The oculomotor nerve carries parasympathetic efferents to the sphincter pupillae muscle.

The optic nerve carries sympathetic postganglionic fibres to the dilator pupillae muscle.

The trochlear nerve supplies the superior oblique muscle.

The oculomotor nerve innervates the superior rectus.



[Q: 4135] OnExamination 2012 - Neurology

A 32-year-old scientist presents to the emergency department with a right facial weakness. He has recently returned from a conference in the USA. There is no history of systemic illness but on examination he has mild neck stiffness and a painful right wrist and knee with a right facial palsy.

Investigations were as follows:

Hb 12 g/dl(13.0-18.0)

WCC $7 \times 10^9/L$ (4-11)

Platelets $190 \times 10^9/L$ (150-400)

Clotting Normal

ESR 32 mm/1st hour(0-15)

Sodium 138 mmol/l (137-144)

Potassium 4.0 mmol/l (3.5-4.9)

Urea 6.9 mmol/l (2.5-7.5)

Creatinine 76 $\mu\text{mol/l}$ (60-110)

Calcium and LFTs Normal

CXR Normal

CT head Normal

CSF: Protein 1.2 g(0.15-0.45)

CSF: WCC 67 (97% lymphocytes)

CSF No organisms seen

What is the most likely diagnosis?

- 1- Behçet's disease
- 2- HIV associated neuropathy
- 3- Lyme disease
- 4- Sarcoidosis
- 5- Tuberculous meningitis

Answer & Comments

Answer: 3- Lyme disease

All the answers are possible causes of a facial palsy.

The high protein and lymphocytosis of the cerebrospinal fluid (CSF) imply an acute or sub-acute infective process. Neurosarcoidosis is thus unlikely.

The main clinical features of Behçet's are not present - orogenital ulceration, iritis and pathergy.

HIV is usually associated with a peripheral sensory neuropathy.

TB meningitis is likely to lead to a generalised systemic illness.

The fact that the patient has recently been to America and has a unilateral facial palsy makes Lyme disease the most likely diagnosis. Lyme disease is spread by the bite of ticks of the genus Ixodes that are infected with Borrelia burgdorferi.



[Q: 4136] OnExamination 2012 - Neurology

Which vertebral level and corresponding structure is correct?

- 1- C4 and bifurcation of the carotid artery
- 2- T2 and manubriosternal joint
- 3- T8 and aortic opening in the diaphragm
- 4- T10 and opening for vena cava in diaphragm

- 5- T12 and oesophageal opening in the diaphragm

Answer & Comments

Answer: 1- C4 and bifurcation of the carotid artery

- A. The carotid artery bifurcates at C4.
- B. The manubriosternal joint (angle of Louis) lies at the level of the T4/5 intervertebral disk.
- C. The aortic opening is at T12.
- D. The caval opening in the diaphragm lies at T8.
- E. The oesophageal opening of the diaphragm lies at T10.



[Q: 4137] OnExamination 2012 - Neurology

An adolescent boy presents with unexplained neurological illness.

Which one of the following would suggest a specific cause of substance abuse?

- 1- A history of attention deficit disorder.
- 2- A history of family conflict.
- 3- A history of low self-esteem.
- 4- A history of social isolation.
- 5- Deposits around the mouth.

Answer & Comments

Answer: 5- Deposits around the mouth.

An increasing number of adolescents are experimenting with alcohol, drugs and solvents, usually soon after entering secondary school. Unfortunately, this includes a rising number of young girls smoking.

Factors associated with drug use include low self-esteem, social isolation, depression, family conflicts and other conduct disorders.

Presentations suggestive of substance abuse include altered behaviour, sniffer's rash, injection sites, chronic upper respiratory tract infection, irregular pulse, glue stains on the skin or clothes, and acute intoxication - ataxia, coma, respiratory depression and cardiac arrhythmia.

The only specific indicators of substance abuse among the options in this case are, therefore, the deposits around the mouth which are most likely to be glue.

Sniffer's rash consists of inflammation and ulceration around the mouth and nose.



[Q: 4138] OnExamination 2012 - Neurology

A 45-year-old female primary school teacher presents with shortness of breath and weakness.

There is a diarrhoeal illness going around her school. She is normally fit and well, and takes no medication.

On examination she has marked weakness in her left and right legs, power 2/5 in ankle and knee extension, increasing to 3/5 in hip extension. There is an absence of knee and ankle reflexes, with up going plantar reflex. Sensation is intact.

Considering the likely diagnosis, what test would you order next?

- 1- Anti-GQ1b antibodies
- 2- Campylobacter jejuni antibody level
- 3- CT brain
- 4- Nerve conduction testing
- 5- Vital capacity

Answer & Comments

Answer: 5- Vital capacity

It is likely that this lady has Guillain-Barre syndrome (GBS), an immune-mediated acute inflammatory demyelinating polyneuropathy.

It often follows infection, especially viral or Campylobacter jejuni. Its most common presentation is with progressive, symmetric, ascending weakness, with hyporeflexia, with or without autonomic and sensory features. In severe cases it can affect respiratory and cardiovascular function.

Therefore, especially given that this lady feels breathless; it is of utmost importance to record her vital capacity, and to monitor it until recovery, as approximately 30% of patients require intubation.

GBS is usually a clinical diagnosis as treatment and ITU admission need to be organised urgently.

Campylobacter jejuni serology may help to find the precipitant of GBS, however only 40% of cases have positive serology, and it will not save this patient's life.

CT brain will be of little help as this patient is demonstrating lower motor neurone signs (flaccid paralysis with hyporeflexia).

Nerve conduction studies will show a slowing/delay in conduction, this will help to confirm your diagnosis, but will not save her life.

Anti-GQ1b antibodies are found in Miller Fisher syndrome, a variant of GBS, with ophthalmoplegia, areflexia and ataxia



[Q: 4139] OnExamination 2012 - Neurology

Causes of dilated pupils include which of the following?

- 1- Argyll Robertson pupil
- 2- Ethylene glycol poisoning
- 3- Myotonic dystrophy
- 4- Organophosphate poisoning
- 5- Pontine haemorrhage

Answer & Comments

Answer: 2- Ethylene glycol poisoning

Causes of dilated pupils include:

Holmes-Adie (myotonic) pupil

Third nerve palsy

Drugs and poisons (atropine, cobalt [CO], ethylene glycol).

Causes of small pupils include:

Horner's syndrome

Old age

Pontine haemorrhage

Argyll Robertson pupil

Drugs and poisons (opiates, organophosphates).



[Q: 4140] OnExamination 2012 - Neurology

A 67-year-old gentleman presents with purulent cough and fever. He has a right lower lobar consolidation on x ray.

This is his third hospital admission for right sided pneumonia. He is not a smoker. His wife reports that he has been choking on food for the past few months and she has noticed that he has been stumbling and dragging his left foot for about five months.

On examination he has atrophy of his quadriceps bilaterally with fasciculations. There is loss of ankle jerk on the left with power 3/5, positive Babinski sign and normal sensation. His right leg has hyperreflexic ankle jerks but absence of knee jerk. There is also marked weakness throughout and fasciculations. Sensation is intact.

What is the likely diagnosis?

1- Amyotrophic lateral sclerosis

2- Charcot-Marie-Tooth disease

3- Huntington's disease

4- Miller Fisher syndrome

5- Multiple sclerosis

Answer & Comments

Answer: 1- Amyotrophic lateral sclerosis

Amyotrophic lateral sclerosis (ALS) is a form of motor neurone disease.

It causes degeneration of upper (UMN) and lower motor neurones (LMN), therefore giving a mixed picture with fasciculations and spasticity, weakness and hypo- or hyperreflexia. Sensation and autonomic function are usually unaffected.

Cognition is usually normal, although they may have emotional lability.

Patients usually notice stumbling gait or foot drop if legs affected first, they may progress to more 'bulbar' signs or arm signs.

The diagnosis of ALS requires mixed UMN and LMN signs that are unattributable to any other disease. There is no definitive test for ALS, however MRI, EMG and NCS may help.

Charcot-Marie-Tooth disease is an hereditary sensory and motor neuropathy. There are several types with different genes identified. The features are pes cavus, 'champagne bottle' legs, hyporeflexia and fasciculations with distal sensory loss. Twenty five per cent of patients have a palpable popliteal nerve.

Huntington's disease is a neurodegenerative genetic disorder that is autosomal dominant. The features are of choreiform movements, problems with coordination and walking, behavioural and psychiatric problems. The disease leads eventually to dementia and premature death.

Miller Fisher is a form of Guillain-Barré syndrome (GBS) with areflexia, ataxia and ophthalmoplegia.

Multiple sclerosis would present in this age group and sex. It is due to autoimmune

mediated demyelination. To make the diagnosis there must be two separate attacks separated in time and space (that is, affecting two different nerves and on two separate occasions).

The commonest signs and symptoms are

Optic neuritis

Sensory loss

Spinal cord symptoms with spasticity

Autonomic dysfunction of bladder and bowel

Constitutional symptoms such as fatigue and depression.



[Q: 4141] OnExamination 2012 - Neurology

A 46-year-old father of three has just been diagnosed with Huntington's disease.

His oldest daughter is 21-years-old and thinking about starting a family soon.

He asks you what the chances are of his daughter also having Huntington's disease?

- 1- She will be a carrier as it is X linked.
- 2- She will definitely inherit it.
- 3- She will not have it as it is X linked
- 4- There is a 50% chance that she will have it
- 5- There is a 25% chance that she will have it.

Answer & Comments

Answer: 4- There is a 50% chance that she will have it

Huntington's disease is a neurodegenerative genetic disorder that is autosomal dominant.

Therefore she has a 50% chance of having the disease as she needs only to inherit one mutant gene, from her father.

The features are of choreiform movements, psychiatric illness and eventually dementia.



[Q: 4142] OnExamination 2012 - Neurology

A 78-year-old man presents to the Emergency Department with a right sided facial palsy affecting the whole of the right side of his face.

Of the following, which is the most likely cause?

- 1- Left sided infarct affecting the internal capsule
- 2- Left sided infarct affecting the frontal lobe
- 3- Right sided infarct affecting the internal capsule
- 4- Right sided seventh nerve palsy
- 5- Right sided fifth nerve palsy

Answer & Comments

Answer: 4- Right sided seventh nerve palsy

Upper motor neuron lesions tend to spare the forehead as it is bilaterally innervated. Forehead involvement suggests a lower motor neuron (LMN) lesion.

Regarding the options:

A, B and C are incorrect as forehead involvement suggests a LMN lesion.

D is correct as the forehead is involved. Muscles of facial expression are controlled by the seventh nerve.

E is incorrect as the fifth nerve does not innervate muscles of facial expression.



[Q: 4143] OnExamination 2012 - Neurology

A 70-year-old man presents with difficulty speaking.

He has a history of diabetes, hypertension, hypercholesterolaemia, chronic obstructive pulmonary disease. He is currently on aspirin, simvastatin, amlodipine and hydrochlorothiazide.

On examination the patient is awake, his blood pressure is 150/70 mmHg. His pulse is irregularly irregular.

He has 4/5 strength in the right arm and leg and 5/5 strength on the left. When asked to point to the window he does this correctly. When told to raise his arms and place his hands out he is seen to have a pronator drift on the right. He is shown a pen and asked what it is. His answer is unintelligible. He is asked to use it appropriately and begins to write on a piece of paper perfectly. When asked to repeat "Today is a sunny day", he attempts it but appears severely dysarthric and cannot be understood.

This type of dysphasia localises to?

- 1- Aphemia
- 2- Fluent aphasia
- 3- Non-fluent aphasia
- 4- Transcortical motor aphasia
- 5- Transcortical sensory aphasia

Answer & Comments

Answer: 1- Aphemia

In Wernicke's or fluent or receptive aphasia the patient is able to form correct grammatical sentences but language content is incorrect. It localises to the dominant superior temporal gyrus. There is poor comprehension and repetition but verbal output is fluent.

In Broca's or non-fluent or expressive aphasia the patient is unable to name objects with poor comprehension and repetition. It localises to the Broca's area in the left posterior inferior frontal gyrus.

In transcortical motor aphasia, which localises to the anterior superior frontal lobe, the patient has good comprehension and repetition but has halting, effortful speech. Patients also have impaired writing skills.

Transcortical sensory aphasia is what is described in this case. It is characterised by impaired auditory comprehension with intact repetition and fluent speech, and is caused by damage to the temporal lobes. It differs from Wernicke's aphasia in that patients still have intact repetition, and exhibit echolalia (the compulsive repetition of words). Improvement may be seen with speech therapy.

Aphemia is a type of aphasia in which there is severe dysarthria and impairment of verbal output. There is intact comprehension. It is believed to be the result of pars opercularis, inferior pre-Rolandic gyrus or subcortical lesions.



[Q: 4144] OnExamination 2012 - Neurology

A 70-year-old man presents with difficulty speaking.

He has a history of diabetes, hypertension, hypercholesterolaemia, chronic obstructive pulmonary disease. He is currently on aspirin, simvastatin, amlodipine and hydrochlorothiazide. On examination the patient is awake; his blood pressure is 150/70 mmHg. His pulse is irregularly irregular. He has 4/5 strength on the right arm and leg and 5/5 strength on the left.

When asked to point to the window he appears unable to do so. When told to raise his arms and place his hands out he does not. When visually shown the same action he is able to perform it. When asked to repeat 'Today is a sunny day', he is unable to do so. He appears frustrated and makes no intelligible words.

With what type of dysphasia is this consistent?

- 1- Broca's aphasia
- 2- Global aphasia
- 3- Transcortical motor aphasia
- 4- Transcortical sensory aphasia

5- Wernicke's aphasia

Answer & Comments

Answer: 2- Global aphasia

In Broca's or non-fluent or expressive aphasia the patient is unable to name objects with poor comprehension and repetition. It localises to the Broca's area in the left posterior inferior frontal gyrus.

In transcortical motor aphasia, which localises to the anterior superior frontal lobe, the patient has good comprehension and repetition but has halting, effortful speech. Patients also have impaired writing skills.

Transcortical sensory aphasia is characterised by impaired auditory comprehension with intact repetition and fluent speech, and is caused by damage to the temporal lobes. It differs from Wernicke's aphasia in that patients still have intact repetition, and exhibit echolalia (the compulsive repetition of words). Improvement may be seen with speech therapy.

In Wernicke's or fluent or receptive aphasia the patient is able to form correct grammatical sentences but language content is incorrect. It localises to the dominant superior temporal gyrus. There is poor comprehension and repetition but verbal output is fluent.

Global aphasia is what is described in this case. It results in an almost mute patient with deficits in all aspects of language: spontaneous speech, naming, repetition, auditory comprehension, reading and writing. Global aphasia is commonly seen in patients with large infarctions of the left cerebral hemisphere, usually due to occlusion of the internal carotid or middle cerebral artery. This results in resulting in damage of Broca's, Wernicke's and the arcuate fasciculus. It is also usually associated with right hemiplegia and right homonymous hemianopia, but it is increasingly recognised in isolation. The visual

centres remain intact and therefore patients are able to follow instructions shown to them.



[Q: 4145] OnExamination 2012 - Neurology

What is the mechanism of action of tetrabenazine?

- 1- Antimuscarinic
- 2- Monoamine oxidase inhibitor
- 3- Activates GABA_A receptors
- 4- Dihydropyridine calcium channel antagonist
- 5- VMAT inhibitor (vesicular monoamine transporter-2)

Answer & Comments

Answer: 5- VMAT inhibitor (vesicular monoamine transporter-2)

- A. Antimuscarinic drugs include trihexyphenidyl used in Parkinson's disease.
- B. Selegiline is a monoamine oxidase inhibitor used in Parkinson's disease.
- C. Benzodiazepines activate GABA_A receptors.
- D. Dihydropyridine calcium channel antagonists include amlodipine.



[Q: 4146] OnExamination 2012 - Neurology

A 62-year-old male presents with weakness of the right hand. You note global wasting of the small hand muscles, there is also sensory loss over the medial border of the forearm around the elbow.

Which nerve root is damaged?

- 1- C5
- 2- C6
- 3- C7

4- C8

5- T1

Answer & Comments**Answer:** 5- T1

This patient has Klumpke's paralysis due to damage to the T1 nerve root. This root eventually supplies the median and ulnar nerves.

The ulnar nerve supplies all of the intrinsic hand muscles except for those of the thenar eminence and the first and second lumbricals which are innervated by the median nerve.



[Q: 4147] OnExamination 2012 - Neurology

A 21-year-old male is admitted with acute onset headache and is drowsy. He is opening his eyes spontaneously, is disoriented and is localising painful stimuli. He has a normal computed tomography scan.

Which of the following is the next most appropriate investigation for this patient?

- 1- Cerebral angiography
- 2- Lumbar puncture
- 3- Magnetic resonance angiography
- 4- Magnetic resonance imaging
- 5- No further investigations necessary

Answer & Comments**Answer:** 2- Lumbar puncture

Lumbar puncture (LP) is not usually required unless the history is suggestive and the CT is normal as in this case. Blood will be present in the cerebral spinal fluid (CSF) (if a bloody tap is suspected the number of red blood cells should fall with each successive sample).

If the LP is performed six hours after onset of symptoms the supernatant fluid should be

examined for xanthochromia after centrifugation.



[Q: 4148] OnExamination 2012 - Neurology

A 21-year-old female is diagnosed with Guillain-Barre syndrome.

On examination her legs are areflexic and she has decreased sensation in her legs and arms.

What is the best investigation for monitoring respiratory function in this patient?

- 1- Chest expansion
- 2- FEV₁
- 3- FEV₁/FVC ratio
- 4- PEFR
- 5- Vital capacity

Answer & Comments**Answer:** 5- Vital capacity

Forced vital capacity (FVC) is very helpful in guiding disposition and therapy.

ITU admission is recommended when FVC is less than 20 mL/kg and intubation is recommended in most cases when FVC is less than 15 mL/kg.



[Q: 4149] OnExamination 2012 - Neurology

A 27-year-old woman presents to the Emergency department complaining of a diffuse headache for about a week. She says that her eyes have been 'going funny' every time she bends down to put on her shoes and she has vomited every morning for the past five days.

You notice that she frequently attends the Emergency department with minor problems - pelvic pain, low mood and most recently ear ache.

Which of the following is the most important diagnosis to consider?

- 1- Cerebral sinus thrombosis
- 2- Depression
- 3- Drug misuse
- 4- Otitis interna
- 5- Pregnancy

Answer & Comments

Answer: 1- Cerebral sinus thrombosis

This woman gives a history that is suspicious of raised intracranial pressure (ICP).

Vomiting in the morning is characteristic of raised ICP as it follows a period of lying flat.

Bending over causes a transient increase in already raised ICP. This further compresses the optic nerve and causes visual disturbance. Patients may also notice this when coughing or straining.

The patient's recent ear ache could have been a localised infection predisposing her to cerebral venous sinus thrombosis.

It is important not to dismiss immediately patients who frequently present with minor ailments.

A. This is the best answer (see above).

B. Depression is not the best answer. Depressed patients may present frequently with seemingly minor ailments, however in this case it would be important to rule out cerebral sinus thrombosis first.

C. Drug misuse is not the best answer. Patients who misuse drugs may present with multiple problems such as headache and vomiting. However, this history is suspicious for cerebral sinus thrombosis so this should be ruled out as a matter of urgency.

D. Otitis interna is not the best answer. This can cause headaches and vomiting and the patient may well have it as she was recently complaining of ear ache. However, this history is suspicious for cerebral sinus

thrombosis so this should be ruled out as a matter of urgency.

E. Pregnancy is not the best answer. Pregnant patients may well vomit in the morning and have vague headaches. However, this history is suspicious for cerebral sinus thrombosis so this should be ruled out as a matter of urgency.



[Q: 4150] OnExamination 2012 - Neurology

Hearing losses of a mild degree or worse (>25dB) are present in around 10% of the population. As the population ages, the percentage of people with hearing loss also increases.

Which of the following age-percentage loss combinations is not correct for the general population?

- 1- At birth approximately 0.3% affected
- 2- Aged 50-59: approximately 10% affected
- 3- Aged 60-69: approximately 25% affected
- 4- Aged 70-79: approximately 50% affected
- 5- Aged 80-89: approximately 50% affected

Answer & Comments

Answer: 5- Aged 80-89: approximately 50% affected

Percentage of the population with a significant hearing loss increases with each decade of life.

For the 80-89-year-old age group, around 70-80% of them will have a degree of hearing loss >25dB.



[Q: 4151] OnExamination 2012 - Neurology

A 65-year-old male presents with acute severe headache, ataxia and vomiting. Six hours later he became drowsy.

On examination he had left horizontal nystagmus, a partial left sixth cranial nerve palsy and extensor plantar responses. His blood pressure was 188/110 mmHg.

What is the most likely cause for this deterioration?

- 1- Brain stem herniation
- 2- Cerebral oedema
- 3- Dehydration
- 4- Malignant hypertension
- 5- Non-convulsive status epilepticus

Answer & Comments

Answer: 1- Brain stem herniation

The most likely explanation of the sudden deterioration will be brain stem herniation. The sudden onset of headache, ataxia and vomiting a few hours prior to this suggest that there may have been an intracranial haemorrhage which led to mass effect and subsequent herniation.

Brain herniation often causes false localising signs due to compression of various areas of the brain. There are various forms of herniation, which are outside the scope of this question. Simply, it usually follows two patterns: uncal herniation or central herniation.

Clinical presentation of uncal herniation includes a third nerve paresis (ipsilateral dilated pupil, abnormal external ocular movements, including nystagmus), contralateral hemiparesis, which can lead to ipsilateral hemiparesis. The third nerve paresis occurs due to compression of the parasympathetic fibres around the third nerve, which results in unopposed sympathetic response. Contralateral hemiparesis occurs with compression of the cerebral peduncle. Ipsilateral hemiparesis and third nerve palsy occur late when the lateral translation is so great that it compresses the contralateral third nerve and peduncle.

Central herniation usually presents with confusion and drowsiness, followed by impaired vertical gaze, small pupils, impaired oculoccephalic reflexes and bilateral corticospinal tract signs including increased tone and Babinski signs.

Additional signs are present due to raised intracranial pressure: bradycardia, hypertension, irregular breathing (Cushing response) and a sixth-nerve palsy. The sixth nerve is usually the first to be compressed due to its long extracerebral intracranial course.

Diplopia from either a third or sixth nerve palsy can cause nystagmus.

This patient needs immediate intensive care support, with intubation and hyperventilation. The case should be discussed urgently with neurosurgeons, and their advice sought regarding the possibility of operative intervention. Intravenous mannitol and other hyperosmolar solutions are often indicated, and should be considered.

Cerebral oedema could account for the sixth nerve palsy, nystagmus and hypertension, but the deterioration with impaired consciousness and extensor plantar responses should lead you to consider herniation as the cause.

Dehydration would not cause this constellation of neurological signs.

The blood pressure in malignant hypertension is typically higher than this (>220/120).

This history is not typical for status epilepticus.



[Q: 4152] OnExamination 2012 - Neurology

A 55-year-old man presents with a resting tremor of his right arm and a diagnosis of idiopathic Parkinson's disease is made.

Which one of the following drugs is most likely to help his tremor?

- 1- Amantadine
- 2- Benzhexol
- 3- Cabergoline
- 4- Co-careldopa
- 5- Selegiline

Answer & Comments

Answer: 2- Benzhexol

Anticholinergic treatment (for example, benzhexol) is the treatment of choice for tremor predominantly Parkinson's disease.

L-dopa and dopamine agonists are the treatment of choice for bradykinesia and rigidity.



[Q: 4153] OnExamination 2012 - Neurology

A 55-year-old man with alcohol dependency presents with a seizure which is attributed to alcohol withdrawal.

Which one of the following statements regarding these seizures is correct?

- 1- Long term diazepam therapy is indicated
- 2- Long term therapy with phenytoin is indicated
- 3- Seizures are likely to be accompanied by hallucinations
- 4- Seizures may be termed "alcoholic blackouts"
- 5- Seizures typically occur within 48 hours of alcohol withdrawal

Answer & Comments

Answer: 5- Seizures typically occur within 48 hours of alcohol withdrawal

Patients with a history of drug abuse are at high risk of developing seizures.

Such seizures occur characteristically within 48 hours of alcohol discontinuation (usually in the morning).

Long term therapy with antiepileptic treatment is not indicated in those patients.

CT brain is indicated in patients with suspected head injury and/or abnormal clotting screen, in order to exclude a subdural haematoma.



[Q: 4154] OnExamination 2012 - Neurology

A 35-year-old woman presents with pains in the right arm.

On examination she has wasting and weakness of the intrinsic muscles of the right hand, absent tendon reflexes in the right arm and impaired pinprick sensation in the right hand and forearm.

What is the most likely diagnosis?

- 1- Combined median and ulnar nerve lesions
- 2- Lower trunk brachial plexus lesion
- 3- Neuralgic amyotrophy
- 4- Syringomyelia
- 5- Thoracic outlet syndrome

Answer & Comments

Answer: 4- Syringomyelia

Median and ulnar nerve lesions would not cause absent reflexes in the arm.

Lower trunk brachial plexus (C8/T1) would not cause absent reflexes in the arm.

Neuralgic amyotrophy affects the upper plexus (C5-6) and therefore does not cause wasting of small muscles of hand.

Thoracic outlet syndrome will not cause absent reflexes.

Syringomyelia typically causes loss of reflexes, spinothalamic sensory loss, and weakness. It can be asymmetrical initially.



[Q: 4155] OnExamination 2012 - Neurology

A young woman who has suffered from cerebral venous sinus thrombosis associated with pregnancy is most likely to have been affected during which of the following periods?

- 1- During birth
- 2- In the 1st trimester
- 3- In the 2nd trimester
- 4- In the 3rd trimester
- 5- In the postpartum period

Answer & Comments

Answer: 5- In the postpartum period

Venous sinus thrombosis is associated with the oral contraceptive pill, the post partum period and other hypercoagulable states.

The clinical signs include

- Papilloedema
- Cranial nerves III, IV and VI
- Ocular chemosis and
- Proptosis.



[Q: 4156] OnExamination 2012 - Neurology

A 26-year-old male epileptic is admitted with temperature and rash.

Over the last one week a rash has developed and he has become increasingly ill. Recently he has had some problems with epileptic control and has commenced carbamazepine with valproate.

Examination reveals an unwell patient with a temperature of 39°C, a diffuse erythematous,

painful rash with evidence of some lateral sliding of these erythematous areas on palpation.

There is also blistering and inflammation of the oral cavity.

What is the likely diagnosis?

- 1- Erythema elevatum diutinum
- 2- Exfoliative dermatitis
- 3- Pustular psoriasis
- 4- Toxic epidermal necrolysis
- 5- Toxic shock syndrome

Answer & Comments

Answer: 4- Toxic epidermal necrolysis

This patient's presentation and clinical description suggests a diagnosis of toxic epidermal necrolysis (TEN) due to carbamazepine therapy.

TEN is a severe mucocutaneous exfoliative disease with an uncertain pathogenesis and a high mortality rate.

It is difficult to say whether it is another variant of Stevens-Johnson syndrome and treatment of both are similar.

It is often idiopathic but may be associated with:

Viral infections

Leukaemia

Lymphoma and

Drugs (in particular sulphonamides and anticonvulsants).

The suggested association with carbamazepine in this case makes toxic shock syndrome due to Staph. aureus remote, which like pustular psoriasis would not be expected to affect the mucous membranes.



[Q: 4157] OnExamination 2012 -
Neurology

An 80-year-old man presented to his GP having developed uncontrollable flinging movements of his right arm and leg in the last few days. He had been previously well prior to the event.

The movements were irregular involving the proximal limb muscles and did not follow a particular pattern. They occurred several times a minute and had led to several falls. He had a past medical history of hypertension and ischaemic heart disease and took regular ramipril and aspirin. He was a smoker of 10 cigarettes per day and did not drink any alcohol. There was no family history of neurological disease.

On examination he was alert and orientated, but had several episodes of flinging proximal movements of his right upper and lower limb that made examination difficult. Tone, power and reflexes all appeared normal and there were no obvious cranial nerve abnormalities. General examination revealed a blood pressure of 140/90mmHg, pulse of 78/min and regular and heart sounds were normal.

Investigations revealed:

Haemoglobin 15.2 g/dl (13.0 - 18.0 g/dL)

Mean cell volume 92 fL (80 - 96 fL)

White cell count $10.5 \times 10^9/L$ ($4 - 11 \times 10^9/L$)

Platelets $299 \times 10^9/L$ ($150 - 400 \times 10^9/L$)

Serum Sodium 135 mmol/L (137 - 144 mmol/L)

Serum Potassium 4.5 mmol/L (3.5 - 4.9 mmol/L)

Serum Urea 3.6 mmol/L (2.5 - 7.5 mmol/L)

Serum Creatinine 98 $\mu\text{mol/L}$ (60 - 110 $\mu\text{mol/L}$)

Fasting plasma glucose 8.9 mmol/L (3 - 6 mmol/L)

Serum cholesterol 6.2 mmol/L ($< 5.2 \text{ mmol/L}$)

What is the most likely diagnosis in this patient?

- 1- Functional disorder
- 2- Huntington disease
- 3- Infarction within the substantia nigra
- 4- Infarction within the subthalamic nucleus
- 5- Senile chorea

Answer & Comments

Answer: 4- Infarction within the subthalamic nucleus

The patient presents with a history in keeping with hemiballism.

The presence of severe flinging movements affecting proximal muscles and following no particular pattern is typical for hemiballism.

The site of the lesion is in the contralateral subthalamic nucleus, infarction being the commonest cause.

The patient has several arteriosclerotic risk factors including hypertension, hyperlipidaemia, ischaemic heart disease and diabetes.

Usually the flinging movements stop spontaneously in the next four to eight weeks and tetrabenazine is the treatment of choice.

Bilateral ballismus is rare and implicates a metabolic cause usually non-ketotic hyperosmolar coma.



[Q: 4158] OnExamination 2012 -
Neurology

A 73-year-old man presents with an abrupt onset of double vision and left leg weakness.

Examination shows weakness of abduction of the right eye and right-sided facial weakness affecting upper and lower parts of the face. He also has a left hemiparesis.

Where is the lesion?

- 1- Left frontal lobe
- 2- Left lateral medulla

- 3- Right corpus striatum
- 4- Right midbrain
- 5- Right pons

Answer & Comments

Answer: 5- Right pons

The abducens nucleus is next to the facial nucleus in pons.

They commonly co-exist in a pontine cerebrovascular accident (CVA).

Hemiparesis is also a common feature of pontine lesion.



[Q: 4159] OnExamination 2012 - Neurology

A 24-year-old man presents with a five month history of low back pain, radiating to his buttocks, and back stiffness worse in the morning and worse after periods of inactivity.

Which of the following signs is the most likely to be present?

- 1- Exaggerated lumbar lordosis
- 2- Positive femoral stretch test
- 3- Positive Trendelenburg test
- 4- Restricted straight leg raising
- 5- Sacroiliac joint tenderness

Answer & Comments

Answer: 5- Sacroiliac joint tenderness

This is a common presentation of ankylosing spondylitis.

The typical features are stiffness, first thing in the morning and after inactivity, and lower back pain radiating into the buttocks.



[Q: 4160] OnExamination 2012 - Neurology

A CT shows blood in the sylvian fissure.

In which compartment is this blood?

- 1- Epidural
- 2- Subarachnoid
- 3- Subcortical
- 4- Subdural
- 5- Subgaleal

Answer & Comments

Answer: 2- Subarachnoid

Subdural refers to the area between the dura and the arachnoid.

Epidural is between the skull and the dura.

Subgaleal is a potential space between the skull and the scalp aponeurosis.

Subcortical is in the white matter of the brain below the cortex.



[Q: 4161] OnExamination 2012 - Neurology

A 43-year-old woman develops a progressive, ascending motor weakness over several days.

She is hospitalised and requires intubation with mechanical ventilation. She is afebrile. A lumbar puncture is performed with normal opening pressure and yields clear, colourless cerebrospinal fluid (CSF) with normal glucose, increased protein, and cell count of 5/microlitre, all lymphocytes. She gradually recovers over the next month.

Which of the following conditions most likely preceded the onset of her illness?

- 1- Ketoacidosis
- 2- Staphylococcus aureus septicaemia
- 3- Systemic lupus erythematosus
- 4- Viral pneumonia
- 5- Vitamin B₁₂ deficiency

Answer & Comments

Answer: 4- Viral pneumonia

She has Guillain-Barre syndrome often preceded by an episode of infection such as viral (cytomegalovirus [CMV]) or bacterial (Campylobacter).



[Q: 4162] OnExamination 2012 - Neurology

A 72-year-old woman has a five year history of worsening mental functioning with trouble remembering things. She has no problems with movement.

She is noted on an MRI scan of the brain to have symmetrically increased size of the lateral ventricles along with cerebral cortical atrophy in a mainly frontal and parietal distribution.

A lumbar puncture reveals a normal opening pressure, and analysis of the clear, colorless cerebrospinal fluid (CSF) reveals glucose and protein which are in normal ranges.

Cell count on the CSF shows 3 WBCs (all lymphocytes) and 1 RBC.

A fundoscopic examination is normal.

Which of the following findings is most likely associated with her underlying disease process?

- 1- Increased numbers of Lewy bodies
- 2- Loss of Betz cells
- 3- Loss of gamma aminobutyric acid (GABA)
- 4- Perivascular mononuclear inflammation
- 5- Presence of the e4 allele of apolipoprotein E

Answer & Comments

Answer: 5- Presence of the e4 allele of apolipoprotein E

She has findings characteristic for Alzheimer's disease.

Loss of GABA is seen in Parkinson's disease.

Perivascular mononuclear inflammation is seen in multiple sclerosis.

Loss of Betz cells is seen in motor neurone disease.



[Q: 4163] OnExamination 2012 - Neurology

Which one of the following would support a diagnosis of subacute combined degeneration of the cord (SACDC) rather than multiple sclerosis (MS)?

- 1- Absent ankle jerks
- 2- Autonomic symptoms
- 3- Cerebellar signs
- 4- Extensor plantars
- 5- Visual problems

Answer & Comments

Answer: 1- Absent ankle jerks

The causes of absent ankle reflexes and extensor plantars include

Subacute combined degeneration of the cord (posterior column signs, positive Romberg's sign, anaemia, splenomegaly)

Syphilitic taboparesis

Friedreich's ataxia

Motor neurone disease.

Knee reflexes in SACDC may be increased, normal or absent.

In the latter stages of MS with marked muscle wasting, tendon jerks may be difficult to elicit.

All the other features may be common to both conditions - optic atrophy, cerebellar ataxia and spasticity.

The only tricky one is autonomic features because these are rare in both conditions. Remember MS affects the CNS whereas subacute combined degeneration of the cord affects central and peripheral nerves. That is the easiest way of answering the question.



[Q: 4164] OnExamination 2012 -
Neurology

Which of the following is correct concerning pseudotumour cerebri (benign intracranial hypertension)?

- 1- A mildly increased CSF cell count is typical.
- 2- Frequently presents with ataxia.
- 3- Is distinguished from hydrocephalus by the absence of suture separation.
- 4- Is typically associated with focal long tract signs.
- 5- May be caused by prolonged steroid therapy.

Answer & Comments

Answer: 5- May be caused by prolonged steroid therapy.

Pseudotumour cerebri is a clinical syndrome that mimics brain tumours, and is characterised by raised intracranial pressure with normal CSF cell count and protein content, normal ventricular size, anatomy and position.

Causes are:

Metabolic disorders: galactosaemia, hypoparathyroidism, pseudohyperparathyroidism, hypophosphatasia, steroid therapy, hypervitaminosis A, vitamin A deficiency, Addison's disease, obesity, menarche, oral contraceptives, pregnancy

Infections: Roseola infantum, chronic otitis media, mastoiditis, Guillain- Barré syndrome

Drugs: Nalidixic acid, tetracycline

Haematological disorders: Polycythaemia, haemolytic and iron deficiency anaemia, Wiskott-Aldrich syndrome

Destruction of intracranial drainage by venous thrombosis: Lateral sinus or posterior

sagittal sinus thrombosis, head injury, obstruction of the superior vena cava.

It usually presents with headache and vomiting, though this is rarely as bad as that associated with posterior fossa tumour.

Diplopia is common due to sixth nerve palsy. Children are alert with no systemic upset. A bulging fontanelle, cracked pot sounds, or separation of the cranial sutures may be present. Papilloedema with an enlarged blind spot is the most consistent sign beyond infancy.

Focal and neurological signs indicate a process other than pseudotumour cerebri. It may be complicated by optic atrophy and blindness.

Most can be treated conservatively with monitoring of visual acuity. For others, multiple lumbar punctures may be necessary to reduce intracranial pressure.

Very rarely are shunts required.



[Q: 4165] OnExamination 2012 -
Neurology

Which of the following is a characteristic feature of transient global amnesia?

- 1- Abnormal behaviour
- 2- Apraxia
- 3- Confabulation
- 4- Loss of personal identity
- 5- Normal perception

Answer & Comments

Answer: 5- Normal perception

Transient global amnesia (TGA) is a syndrome characterised by the abrupt onset of anterograde amnesia, accompanied by repetitive questioning. Patients are usually disoriented in time and place, but not usually person. They often recognise their disorientation. By definition, there are no

other neurological deficits. It usually occurs in middle-aged or elderly people, and attacks typically occur in the mornings and last minutes to hours (mean 6h). The attack is often associated with headache, nausea and dizziness. The ability to lay down new memories is gradually recovered, leaving only a dense amnesic gap for the duration of the episode (and often the hours prior to it). Recurrence is unusual.

Whilst clear-cut focal neurological signs are exclusion criteria for TGA, associated symptoms are commonly observed. The patient's behaviour during an attack may lead to them being described as confused. Other associated features are chills, fear of death, paraesthesia, emotional upset and chest pain.

Migraine may be a risk factor in younger patients (<55y). Psychological and vascular risk factors may also have a role. It has also been suggested that TGA may occur after a venous congestion in the context of insufficient jugular-vein valves.

'Characteristic' means that absence of the symptom would make you doubt the diagnosis. The presence of any of the other suggested options would suggest an alternative diagnosis.



[Q: 4166] OnExamination 2012 - Neurology

Which of the following would be expected features of a left posterior cerebral artery occlusion?

- 1- A right homonymous hemianopia
- 2- Decerebrate state
- 3- Internuclear ophthalmoplegia
- 4- Pure aphasia (that is, without alexia)
- 5- Wernicke's aphasia

Answer & Comments

Answer: 1- A right homonymous hemianopia

Internuclear ophthalmoplegia is typical of multiple sclerosis.

Wernicke's aphasia and pure aphasia (that is, without alexia) are middle cerebral artery.

Decerebrate state is most likely a pontine lesion.

Other possible findings in posterior left cerebral artery occlusion are:

Cortical blindness

Visual hallucinations

Thalamic syndrome

Claude's and Weber's syndromes.



[Q: 4167] OnExamination 2012 - Neurology

Which of the following is least likely to cause choreiform movements?

- 1- Polyarteritis nodosa (PAN)
- 2- Polycythaemia rubra vera
- 3- Rheumatic fever
- 4- Systemic lupus erythematosus
- 5- Thyrotoxicosis

Answer & Comments

Answer: 1- Polyarteritis nodosa (PAN)

PAN affects medium sized arteries and usually involves peripheral nerves, bowel and rarely lungs.

Other causes of chorea are Huntington's chorea, rheumatic fever and senile chorea.



[Q: 4168] OnExamination 2012 - Neurology

For which of the following could a right carotid artery stenosis not account?

- 1- Contralateral hemiplegia
- 2- Contralateral hemisensory loss

- 3- Drop attacks
- 4- Dysphasia
- 5- Right amaurosis fugax

Answer & Comments

Answer: 3- Drop attacks

Carotid artery disease causes

Contralateral hemiplegia

Hemisensory loss

Homonymous hemianopia

Dysphasia (right)

Hemineglect (left).

Drop attacks are due to vertebrobasilar insufficiency.



[Q: 4169] OnExamination 2012 - Neurology

A 30-year-old female presents to the eye clinic with an acute history of pain and blurring in the right eye.

Examination reveals a visual acuity of 6/36 in the right eye but 6/6 in the left eye, a central scotoma in the right eye, with a right swollen optic disc.

What is the most likely diagnosis?

- 1- Cavernous sinus thrombosis
- 2- Compression of the optic nerve
- 3- Glaucoma
- 4- Optic neuritis
- 5- Retinal vein occlusion

Answer & Comments

Answer: 4- Optic neuritis

The acute presentation with central scotoma, reduced visual acuity and a swollen optic disc in a young female suggests a diagnosis of multiple sclerosis with a retrobulbar neuritis.



[Q: 4170] OnExamination 2012 - Neurology

A 25-year-old female presented with six months history of depression, irritability and painful sensory symptoms in her legs. Over the last four weeks she presents a broad base ataxic gait.

An MRI brain showed bilateral posterior thalamic nuclei (pulvinar region) high signals.

Which of the following is the most likely diagnosis?

- 1- Herpes simplex encephalitis
- 2- Multiple system atrophy
- 3- New variant CJD
- 4- Sporadic CJD
- 5- Wilson disease

Answer & Comments

Answer: 3- New variant CJD

New variant Creutzfeldt-Jakob disease (CJD) usually presents in a young person, in their twenties or thirties.

In the majority of the cases the first symptoms are psychiatric and painful sensory symptoms in the lower limbs.

Ataxia and involuntary movements (for example, myoclonus) usually appear at an interval of about six months after the initial symptoms.

MRI brain shows bilateral pulvinar (posterior thalamic nuclei) high signals.

EEG is usually normal in new variant CJD.



[Q: 4171] OnExamination 2012 - Neurology

A 60-year-old male is referred with episodes of severe vertigo which may last up to four hours and are associated with vomiting and pain in the right ear.

On examination during an attack he is noted to have right horizontal nystagmus together with mild right-sided sensorineural deafness.

Which one of the following is the most likely diagnosis?

- 1- Acoustic neuroma
- 2- Benign positional vertigo
- 3- Labyrinthitis
- 4- Ménière's disease
- 5- Vertebrobasilar ischaemic attacks

Answer & Comments

Answer: 4- Ménière's disease

This is a typical history of Ménière's disease.

The attacks are paroxysmal, lasting hours and consist of

Vertigo

Vomiting

Pressure within the ear

Deafness.

After many attacks the patient may develop irreversible sensorineural deafness (of low frequency).

Prochlorperazine or cinnarizine usually helps vomiting, and restriction of salt and fluid may hasten resolution. Occasionally diuretics may be used but there is little evidence for efficacy.



[Q: 4172] OnExamination 2012 - Neurology

A 70-year-old female patient presents with two months history of apathy, withdrawal, urinary and faecal incontinence and anosmia.

Of the following where is the most likely anatomical site of the neurological lesion?

- 1- Frontal lobe
- 2- Internal capsule

- 3- Occipital lobe
- 4- Parietal lobe
- 5- Temporal lobe

Answer & Comments

Answer: 1- Frontal lobe

Frontal lobe syndrome usually presents with:

Personality changes

Urinary and faecal incontinence

Anosmia

Expressive dysphasia (dominant lobe)

Release of primitive reflexes (positive grasp, pout and palmomental reflexes)

Epilepsy.

Fifty per cent of patients presenting with status epilepticus (with no previous history of seizures) have frontal lobe tumour.

It can mimic dementia.



[Q: 4173] OnExamination 2012 - Neurology

A 54-year-old Somali lady presents with weakness of her lower limbs.

Four months ago she had noticed weakness of her left leg and this has steadily progressed to affect both legs.

On examination she has multiple bruises of different ages on her legs and body. She has reduced power bilaterally with hyperreflexia, an ataxic gait and head tremor. Her family have noticed her behaving abnormally recently, disinhibited with poor short term memory.

What is the most likely causative agent?

- 1- Cryptococcus neoformans
- 2- Human immunodeficiency virus 1
- 3- Human immunodeficiency virus 2
- 4- JC virus

5- Toxoplasma gondii

Answer & Comments

Answer: 4- JC virus

This lady has progressive multifocal leukoencephalopathy (PML).

The features are:

Behavioural changes

Ataxia

Head tremor

Focal neurology progressing over a period of months to paresis and even coma.

It can be diagnosed via CSF PCR for the JC virus.

Cryptococcus neoformans causes meningitis in HIV positive patients. Patients present with headache, fever, vomiting and few neurological signs.

Toxoplasmosis presents with headache, fever and seizures. They have a typical CT head scan with ring enhancing lesions.

HIV 1 or 2 are the underlying infections making this lady susceptible to other organisms; however it is the JC virus that is making her unwell at this presentation.

PML can present at any CD4 count.

HIV infection can cause dementia, however this progresses over a longer time period. Symptoms are of confusion, depression, reduced concentration, behavioural changes, speech and balance problems as well as muscle weakness.



[Q: 4174] OnExamination 2012 - Neurology

An 18-year-old presents with her third 'funny turn'.

She was witnessed smacking her lips and making repetitive chewing movements. She

recalls a rising epigastric sensation preceding this, but was unaware of what she was doing.

Which of the following would you suspect?

1- Absence seizures

2- Frontal lobe epilepsy

3- Migraine

4- Temporal lobe epilepsy

5- Transient ischaemic attack

Answer & Comments

Answer: 4- Temporal lobe epilepsy

This is a classic description of temporal lobe epilepsy. The commonest finding is hippocampal sclerosis and an MRI is an appropriate investigation.

Spread of the seizure activity to the contralateral temporal lobe impairs memory of the event in the complex partial form of temporal lobe epilepsy.

Regarding the options:

A is incorrect as there are repetitive movements involved.

B is incorrect as it does not tend to involve repetitive mouth movements or gastric rising.

C is incorrect as there is no headache and there is memory loss.

D is correct as temporal lobe epilepsy can present with gastric rising and repetitive mouth movements.

E is incorrect as there is not a sudden onset of focal neurology.



[Q: 4175] OnExamination 2012 - Neurology

A 20-year-old presents to the emergency room having experienced altered mental state for several days. There is no travel history reported.

She is arousable but appears confused. She has spontaneous movements of the limbs which are erratic and non-rhythmical and last a second.

She has reported difficulty in concentration and headaches recently. A head CT is obtained which is normal and a lumbar puncture shows normal protein, glucose and no white cells or red cells.

Laboratory results include a normochromic normocytic anaemia, elevated TSH, normal electrolytes and renal function, normal coagulation and liver studies. Serum and urine toxicology is negative. HIV screen is negative.

She has no history of drug or alcohol abuse. Pregnancy test was negative.

Which of the following laboratory tests should be ordered based on the history?

- 1- Anti-thyroid peroxidase antibodies
- 2- Gamma gluconyl transferase
- 3- Peripheral/blood smear
- 4- Prealbumin
- 5- Thyroglobulin level

Answer & Comments

Answer: 1- Anti-thyroid peroxidase antibodies

Gamma gluconyl transferase would not change the management as the drug screen was negative and liver function tests are normal.

Prealbumin is a marker of nutritional status but would not be important at this time, and albumin was reported normal.

Thyroglobulin levels would not change management; however antibodies to thyroglobulin can be present in Hashimoto's encephalopathy.

Peripheral or blood smear may be chosen because of the anaemia however given this is a normocytic normochromic anaemia it is

likely the result of iron loss through menstruation.



[Q: 4176] OnExamination 2012 - Neurology

A mother comes to your office concerned about her 2-year-old son. She has noticed that he typically laughs inappropriately for no particular reason. Shortly after an event he appears to be fidgeting. These events last only minutes and in between the events he acts normally.

What is your suspected diagnosis?

- 1- Gelastic seizures
- 2- Malingering
- 3- Pseudobulbar affect
- 4- Substance abuse
- 5- Tourette's

Answer & Comments

Answer: 1- Gelastic seizures

Gelastic seizures should be suspected in cases of erratic laughing or crying. It can be hard to identify in young children but there is usually associated automatisms such as fidgeting or lip smacking or change in sensorium.

Pseudobulbar affect can also present with inappropriate affective responses but typically occurs in adult patients with brainstem or frontal disease. It can be seen in multiple sclerosis or motor neuron disease.

The vignette is not typical for a tic disorder and it is unlikely a 2-year-old is malingering or abusing substances.



[Q: 4177] OnExamination 2012 - Neurology

Against which of the following is the specific antibody found in neuromyelitis optica?

- 1- Aquaporin 4
- 2- Glial fibrillary acidic protein

- 3- Myelin basic protein
- 4- Oligoclonal bands
- 5- Transthyretin

Answer & Comments

Answer: 1- Aquaporin 4

Myelin basic protein is elevated in demyelinating disease and is non-specific.

Oligoclonal bands are elevated in inflammatory responses and again are non-specific.

Glial fibrillary acidic protein is used to stain glial cells in immunohistochemistry.

Transthyretin mutations are seen in amyloidosis.



[Q: 4178] OnExamination 2012 - Neurology

A 30-year-old woman presents with problems seeing for the past two days.

She reports that the vision of her left eye is much worse than normal for the last two days. She reports that she woke up and thought there was something in her eye but the vision is getting worse. She denies diplopia but has blurred vision.

On examination her visual acuity is 20/20 in the right eye and finger counting only in the left. There is red desaturation and a relative afferent papillary defect. Her past medical history is unremarkable and she reports never having had neurological symptoms in the past.

On examination of her fundus, what is the most likely finding?

- 1- Cupped disc
- 2- Macular star
- 3- Normal optic disc
- 4- Optic atrophy
- 5- Papilloedema

Answer & Comments

Answer: 3- Normal optic disc

The patient has a clinically isolated syndrome presenting as retrobulbar neuritis. The concern for the patient to develop MS would be high given this initial presentation.

Optic atrophy occurs over a longer period of time.

Papilloedema suggests increased intracranial pressure.

A macular star is a finding seen in some inflammatory diseases but not in optic neuritis.

A cupped disc is seen in glaucoma.



[Q: 4179] OnExamination 2012 - Neurology

A 60-year-old man presented with an episode of right sided weakness that lasted 10 minutes and fully resolved.

Examination reveals that he is in atrial fibrillation.

Assuming he remains in atrial fibrillation which of the following is the most appropriate management regime?

- 1- Aspirin
- 2- No additional drug treatment
- 3- Warfarin, INR range 2 - 3
- 4- Warfarin, INR range 2 - 3 for six months then aspirin
- 5- Warfarin, INR range 3 - 4

Answer & Comments

Answer: 3- Warfarin, INR range 2 - 3

This is a high risk patient for future stroke and should be anticoagulated with warfarin.

An initial target range of international normalised ratio (INR) 2 - 3 is the most appropriate.



[Q: 4180] OnExamination 2012 -
Neurology

A 32-year-old shop worker presents with a 24 hour history of weakness in the hands. She also complains of shortness of breath.

The oxygen saturations are 90% on air. The biceps and triceps reflexes are absent in the left arm and reduced in the right arm.

Which of the following are recognised treatments of this acute presentation?

- 1- Edrophonium
- 2- G-CSF
- 3- Non-steroidal anti-inflammatory drugs
- 4- Physiotherapy
- 5- Plasmapheresis

Answer & Comments

Answer: 5- Plasmapheresis

This young woman has features suggestive of Guillan-Barre syndrome. Classically muscular weakness usually begins in the leg, and ascends to involve the trunk, arms and cranial nerves. However, increasingly clinical variants are being recognised in which weakness initially begins in other areas, including the hands. Early initiation of immunosuppressive treatment has been shown to lead to a good prognosis in these cases.

One important consideration is the monitoring of vital capacity and appropriate management in an environment where intubation can be undertaken rapidly. Specific therapy which can be initiated are plasmapheresis (plasma exchange) and high-dose intravenous immunoglobulin (IVIG) therapy. In UK clinical practice, IVIG is used more frequently as it is easier to administer. Corticosteroids have been linked with worsening of symptoms. Passive physiotherapy is critical whilst weakness persists, progressing to active exercise when the weakness begins to resolve. However,

this does not have an effect on the course of disease.

There is no evidence for the use of non-steroidal anti-inflammatory drugs.

G-CSF is used in neutropenia.

Edrophonium is a reversible acetylcholinesterase inhibitor, which can be used to diagnose myasthenia gravis (although this is rarely done in clinical practice).



[Q: 4181] OnExamination 2012 -
Neurology

A 36-year-old female presents with a six month history of having problems sleeping at night.

She has been woken on numerous occasions by her legs which are irritable and feel that they are being tugged. She needs to keep moving them. This urge lasts for variable periods and she finds little relief from rubbing the legs. No abnormalities are noted on examination of her legs.

Which of the following is the most appropriate treatment for this patient?

- 1- Amitriptyline
- 2- Gabapentin
- 3- Psychiatric referral
- 4- Ropinirole
- 5- Venlafaxine

Answer & Comments

Answer: 4- Ropinirole

This patient has features of restless legs syndrome (RLS). Typically there is an uncomfortable sensation in the legs and a feeling of needing to move them.

The exact aetiology is unknown. Although no specific tests exist for the diagnosis it is based on the International Restless Legs Syndrome Study Group four basic criteria for diagnosing RLS:

A desire to move the limbs, often associated with paraesthesias or dysaesthesias

Symptoms that are worse or present only during rest and are partially or temporarily relieved by activity

Motor restlessness, and

Nocturnal worsening of symptoms.

Treatment depends on the severity of the problem and the most appropriate treatment here would be ropinirole, which is the only agent licensed for this purpose.



[Q: 4182] OnExamination 2012 - Neurology

A 34-year-old male presents with back pain and weakness.

Which of the following would support a diagnosis of prolapsed intervertebral disc?

- 1- Bilateral symmetrical nerve involvement
- 2- Loss of sensation over the left outer upper thigh
- 3- No evidence of nerve compression
- 4- Pain which is unremitting in character
- 5- Pain which is worse on resting

Answer & Comments

Answer: 2- Loss of sensation over the left outer upper thigh

Prolapsed intervertebral disc is associated with pain and neurological loss in one nerve root.

Frequently roots of the sciatic nerve are affected.

Compression of more than one root suggests an alternative diagnosis.

Pain at rest would suggest an alternative diagnosis such as infection, tumour or metabolic disease, as would unremitting pain.



[Q: 4183] OnExamination 2012 - Neurology

A 21-year-old male is admitted with acute onset headache and is drowsy.

He is opening his eyes spontaneously, is disoriented but is localising to painful stimuli.

Which of the following is the investigation of choice for this man?

- 1- Computed tomography (CT)
- 2- Lumbar puncture (LP)
- 3- Magnetic resonance angiography (MRA)
- 4- Magnetic resonance imaging (MRI)
- 5- Positron emission tomography (PET)

Answer & Comments

Answer: 1- Computed tomography (CT)

Urgent CT will confirm diagnosis in 95% of patients with subarachnoid haemorrhage.

Lumbar puncture is not usually required unless the history is suggestive and the CT is normal.

Blood will be present in the cerebro-spinal fluid (if a bloody tap is suspected the number of red blood cells should fall with each successive sample).

If the LP is performed six hours after onset of symptoms the supernatant fluid should be examined for xanthochromia after centrifugation.



[Q: 4184] OnExamination 2012 - Neurology

A 59-year-old female pub landlady presents with acute, severe lumbar back pain.

There is no history of orthopaedic problems and until this event she had been in perfect health.

The patient complains of paraesthesia in the lower limbs and on further questioning has not voided urine since the onset of the pain.

Neurological examination reveals weakness (3/5 of both lower limbs, loss of sensation in L4, L5 and S1). Vibration sensation and joint position sensation is preserved. Reflexes in the ankles and knees are absent and the plantar response is equivocal.

The blood pressure is 158/68 mmHg, heart rate 95 bpm, temperature 36.9°C and ECG shows normal sinus rhythm with no ischaemic changes.

The remainder of the examination is normal.

Which of the following should be undertaken next for this patient?

- 1- CT head
- 2- Duplex scan of aorta
- 3- MRI spinal cord
- 4- Rectal examination
- 5- USS abdomen

Answer & Comments

Answer: 3- MRI spinal cord

This patient has a number of features of cauda equina syndrome. There is distal weakness, with associated sensory loss. Whilst classically patients present with a sensory level, this is variable in clinical practice.

Causes of cauda equina syndrome include herniation of a lumbar disc (at L4/L5 and L5/S1), tumour (metastases, lymphoma, primary spinal tumours), trauma and infection (epidural abscess).

Clinical presentation is varied, but can include low back pain with unilateral or bilateral lower limb motor and/or sensory abnormality and bowel and/or bladder dysfunction with saddle and perineal anaesthesia.

MRI is the investigation of choice to confirm the diagnosis and determine the level of compression and underlying cause. Delayed diagnosis and intervention can lead to permanent neurological damage, and

therefore MRI should be undertaken in a timely fashion.

Determining the presence of bowel dysfunction (with reduced anal tone and sensation) can be helpful prognostically, but does not assist with the differential diagnosis.

The pattern of weakness is not consistent with an intracranial cause, and USS abdomen or duplex scan of the aorta are unlikely to help here.



[Q: 4185] OnExamination 2012 - Neurology

A 78-year-old male is brought to the Emergency department and has a witnessed seizure in the resuscitation room.

His blood glucose is recorded as 1.0 mmol/l. He does not have diabetes, and has no other significant past medical history.

He is given 50 ml of 50% dextrose and he slowly recovers over the next one hour. A serum cortisol concentration later returns as 800 nmol/l (120-600).

Which of the following would be the most relevant investigation for this man?

- 1- Chest x ray
- 2- CT head scan
- 3- Electrocardiogram
- 4- Prolonged 72 hour fast
- 5- Short Synacthen test

Answer & Comments

Answer: 4- Prolonged 72 hour fast

The historical and biochemical evidence here suggests a diagnosis of spontaneous hypoglycaemia, and the most likely cause would be an insulinoma. However, one would wish to exclude possible drug administration and although not mentioned here, a sulphonylurea screen should be undertaken.

He has presented with symptomatic hypoglycaemia, is not diabetic and therefore should not have received insulin or a sulphonylurea.

There is nothing to suggest alcohol or drug misuse. Similarly, there is nothing to suggest sepsis.

However, to prove a diagnosis of spontaneous hypoglycaemia, a prolonged fast is required and should he develop hypoglycaemia, measurement of insulin and C peptide will be needed to confirm the diagnosis.

The appropriate cortisol response during his hypoglycaemic episode (cortisol 800) excludes hypoadrenalism.



[Q: 4186] OnExamination 2012 - Neurology

What is the agent responsible for variant Creutzfeldt-Jakob disease (CJD)?

- 1- Mutant mitochondrial DNA
- 2- Non-protein transmissible pathogen
- 3- Proteinaceous infectious particle
- 4- Retrovirus
- 5- Slow virus

Answer & Comments

Answer: 3- Proteinaceous infectious particle

Variant CJD is a transmissible spongiform encephalopathy. It is associated with the accumulation of an abnormal isoform of a normal host protein (prion protein) in the central nervous system.

This prion protein has no sequence differences from the normal protein, being encoded by the same normal host gene, but there is a major difference in the conformation of the two forms with the prion protein containing less helix structure.

The predominance of this structure confers a remarkable resistance to degradation and allows the protein to accumulate within the central nervous system.



[Q: 4187] OnExamination 2012 - Neurology

A 35-year-old male presents with a 12 month history of involuntary movements of his limbs.

Examination revealed generalised chorea but otherwise no neurological abnormalities.

Involvement of which of the following structures is likely to cause this presentation?

- 1- Caudate nucleus
- 2- Hippocampus
- 3- Lateral geniculate nucleus
- 4- Red nucleus
- 5- Substantia nigra

Answer & Comments

Answer: 1- Caudate nucleus

Caudate nucleus pathology is associated with chorea (for example, in Huntington's disease).

Hippocampus pathology is associated with short term memory impairment (for example, Alzheimer's disease).

Lateral geniculate nucleus pathology causes a visual field defect.

Red nucleus is associated with tremor, which is present both at rest and during action (for example, multiple sclerosis tremor).

Substantia nigra pathology is associated with Parkinson's disease.



[Q: 4188] OnExamination 2012 - Neurology

An 81-year-old female is admitted following a seizure although her relatives state that prior

to this she had been increasingly confused, unsteady and unable to look after herself over the last two to three weeks.

On examination she was drowsy and had a temperature of 37.5°C, and a blood pressure of 192/108 mmHg.

She had a mixed aphasia, with a mild right hemiparesis.

What is the most likely diagnosis?

- 1- Acute cerebral infarction
- 2- Acute intracerebral haemorrhage
- 3- Cerebral abscess
- 4- Chronic subdural haematoma
- 5- Glioblastoma

Answer & Comments

Answer: 4- Chronic subdural haematoma

The history of variable 'confusion' and unsteadiness for some weeks followed by an acute exacerbation is a typical presentation of a subdural haematoma in the elderly population.

Cerebral abscess is unlikely due to the absence of significant fever.

Acute infarction or acute intracerebral haemorrhage would not explain the two week history of confusion and unsteadiness.

Astrocytoma usually causes symptoms over months to years.

Mixed aphasia (or transcortical mixed aphasia) is, simply, not a complete 'global aphasia'. In global aphasia there is receptive and expressive dysphasia.

Patients can often repeat words but not understand commands, name objects or have intelligible spontaneous speech.

'Mixed aphasia' is not specific for stroke, although it can be caused by it. It may be caused by

Alzheimer's disease

Bilateral cerebral damage

Tumours

Thalamic lesions

and so on.

It is an excellent choice of language defect for a 'best of five' question since it is a good distractor.



[Q: 4189] OnExamination 2012 - Neurology

A 45-year-old man presented with a three day history of headache and increasing confusion.

On examination he was febrile with marked neck stiffness.

Investigations revealed:

Cerebrospinal fluid analysis (normal ranges are shown in brackets):

White cell count 600/ml (<5)

White cell differential >90% Neutrophils

Gram stain Gram-negative diplococci

Which one of the following antibiotics, given intravenously, is the most appropriate treatment?

- 1- Ampicillin
- 2- Benzylpenicillin
- 3- Cefuroxime
- 4- Ciprofloxacin
- 5- Gentamicin

Answer & Comments

Answer: 2- Benzylpenicillin

This is clearly a case of meningococcal meningitis. The commonest causes of bacterial meningitis in adults are:

Neisseria meningitidis (Gram negative diplococci)

Streptococcus pneumoniae (Gram positive diplococci).

Treatment of bacterial meningitis

On the basis of Gram stain results:

Gram stain unavailable or no stainable organisms: Cefotaxime ± ampicillin

Gram positive cocci: Cefotaxime + vancomycin

Gram positive bacilli: Ampicillin + gentamicin

Gram negative cocci: Benzylpenicillin (penicillin G)

Gram negative bacilli: Cefotaxime + gentamicin.

On the basis of CSF culture:

Streptococcus pneumoniae

If penicillin MIC <0.06 µgrams/mL: Benzylpenicillin (penicillin G) or cefotaxime

If penicillin MIC >0.1 µgrams/mL (that is, penicillin-resistant pneumococcus): Cefotaxime (+ vancomycin if susceptibility to broad-spectrum cephalosporins reduced)

Neisseria meningitidis: Benzylpenicillin (penicillin G)

Haemophilus influenzae: Cefotaxime

Listeria monocytogenes: Ampicillin + gentamicin

Group B streptococcus: Benzylpenicillin (penicillin G).



[Q: 4190] OnExamination 2012 - Neurology

A 25-year-old-man presented with severe headache, myalgia and a blanching red macular rash. He had returned from Indonesia three days previously.

On examination his blood pressure was 75/50 mmHg. A diagnosis of dengue fever was made.

Which of the following would be given immediately?

1- A single dose of ivermectin

2- Intravenous hydrocortisone 200 mg

3- Intravenous normal saline

4- Metronidazole

5- Tetracycline

Answer & Comments

Answer: 3- Intravenous normal saline

Dengue is transmitted by *Aedes aegypti* mosquito in endemic areas.

There are four serotypes.

Re-infection with a different serotype aggravates the infection and is associated with serious complications such as dengue haemorrhagic fever (DHF) and dengue shock syndrome (DSS). Treatment is supportive with fluid replacement, blood transfusion and correction of clotting.

Corticosteroids have no role.

In the first few days the rash is macular, blanching and transient. The second rash which looks like measles and is morbilliform, maculopapular, sparing palms and soles.

Do not confuse dengue fever with dengue haemorrhagic fever. Medline Plus



[Q: 4191] OnExamination 2012 - Neurology

A 16-year-old male presents with a five year history of absence seizures with three recent generalised convulsions.

Which one of the following drugs, given as monotherapy, is most likely to control his fits?

1- Clonazepam

2- Ethosuximide

3- Gabapentin

4- Sodium valproate

5- Topiramate

Answer & Comments

Answer: 4- Sodium valproate

Absences, generalised tonic clonic seizures and myoclonus are features of primary generalised epilepsy.

The treatment of choice includes sodium valproate, lamotrigine and topiramate.

Clonazepam is useful in myoclonus, ethosuximide in isolated absences and gabapentin in partial seizures.

Valproate would be the most appropriate first line agent.



[Q: 4192] OnExamination 2012 - Neurology

A 16-year-old boy presents with rapidly progressive weakness over three days, which is attributed to Guillain-Barré syndrome.

Which one of the following is the most appropriate treatment?

- 1- Azathioprine
- 2- Cyclosporin
- 3- Immunoglobulin
- 4- Methotrexate
- 5- Methylprednisolone

Answer & Comments

Answer: 3- Immunoglobulin

Randomised controlled trials have shown that human immunoglobulins and plasma exchange improve outcome in Guillain-Barré syndrome (GBS).

Other immunosuppressive treatment does not have a role in the treatment of GBS.



[Q: 4193] OnExamination 2012 - Neurology

A 24-year-old law student attends with visual loss affecting the right eye. She reports a constant headache for the last three months, and absence of menses for six months.

On examination her visual acuity in the right eye is 6/24, with slight constriction of the temporal field in that eye but she has no other neurological deficit. She is afebrile and haemodynamically stable.

What is the diagnosis?

- 1- Glaucoma
- 2- Migraine
- 3- Multiple sclerosis
- 4- Pituitary tumour
- 5- Pregnancy

Answer & Comments

Answer: 4- Pituitary tumour

This patient has a pituitary lesion; the history of headache and amenorrhoea suggests a prolactinoma or non-functioning tumour. This has been complicated by involvement of the visual pathway, which has precipitated her visual loss.

She needs urgent assessment of her pituitary function, imaging of the pituitary gland by MRI scanning.

One of the most important investigations to perform would be a serum prolactin.

The amenorrhoea would argue against this being retrobulbar neuritis associated with MS and similarly the peripheral visual field constriction would be unusual as a central scotoma and fluctuating visual loss would be more typical.



[Q: 4194] OnExamination 2012 - Neurology

A 70-year-old woman presented with an

acute, severe occipital headache, unsteadiness of her gait and vomiting. She had a history of poorly controlled hypertension.

On examination there was nystagmus to the left, ataxia of the left limbs and gait ataxia.

What is the most likely diagnosis?

- 1- Acute cerebellar haemorrhage
- 2- Basal ganglia haemorrhage
- 3- Pontine haemorrhage
- 4- Subdural haemorrhage
- 5- Temporal lobe haemorrhage

Answer & Comments

Answer: 1- Acute cerebellar haemorrhage

Cerebellar haemorrhage

The most common symptoms are of severe nausea and vomiting and ataxia. Headache may be severe. Patients with cerebellar haemorrhage can rapidly become comatose within hours after the onset from herniation, because of its limited space in the posterior fossa.

Pontine haemorrhage

There are numerous nuclei located within the pons. Rapidly deteriorating level of consciousness, impaired extraocular movement and extensive sensorimotor deficits are clinical clues to pontine haemorrhage.

Basal ganglia haemorrhage

Contralateral hemiparesis, hemisensory loss, or hemi-inattention. Aphasia, especially non-fluency and impaired comprehension, is frequently seen if haemorrhage occurs in the posterior limb of the left internal capsule.



[Q: 4195] OnExamination 2012 - Neurology

A 56-year-old female presented to her GP

with pain in the left side of her neck radiating down the lateral aspect of her arm and forearm.

She had also noticed some weakness of her left shoulder and struggled to elevate her arm. She had a longstanding history of rheumatoid arthritis, treated with steroids and penicillamine. She was a non-smoker and did not drink any alcohol.

On examination there was some wasting over the left deltoid and evidence of fasciculations. Neck movements appeared full except that lateral movement exacerbated the left arm pain.

On examination of the upper limb, tone appeared reduced at the elbow and wrist and the biceps jerk was only present on re-enforcement. The left supinator jerk was inverted and the triceps jerk appeared brisk. There was some weakness of left shoulder abduction, elbow flexion and supination, but finger movements and elbow extension were intact. There was a sensory deficit over the lateral aspect of the left upper arm and forearm. The right arm appeared normal.

On examination of the lower limb, tone was increased, but power appeared normal. All reflexes were brisk and both plantar responses were extensor.

Investigations showed:

Haemoglobin 11.4 g/dl (13.0-18.0 g/dl)

White cell count $3.4 \times 10^9/L$ ($4-11 \times 10^9/L$)

Platelets $245 \times 10^9/L$ ($150-400 \times 10^9/L$)

ESR (Westergren) 45 mm/1st hour (0-15 mm/1st hour)

Serum Sodium 145 mmol/L (137-144 mmol/L)

Serum Potassium 3.2 mmol/L (3.5-4.9)

Serum urea 6.7 mmol/L (2.5-5 mmol/L)

Serum Creatinine 135 $\mu\text{mol/L}$ (60-110 $\mu\text{mol/L}$)

Serum creatine kinase 178 U/L (24-170 U/L)

Fasting plasma glucose 8.7 mmol/L (3-6 mmol/L)

What is the most likely diagnosis?

- 1- Cervical myelopathy
- 2- Circumflex neuropathy
- 3- Inclusion body myositis
- 4- Motor neurone disease
- 5- Steroid-induced myopathy

Answer & Comments

Answer: 1- Cervical myelopathy

This patient has a cervical myelopathy, most likely as a result of her rheumatoid arthritis.

The likely level is C5/C6 given that there is weakness of the deltoid, biceps and supinator and the supinator jerk is inverted.

She also has long tract signs in her legs with hypertonia and hyperreflexia.

A circumflex neuropathy would account for the weakness and fasciculations of the deltoid, but would not explain the upper motor neurone signs in the legs, or weakness of the biceps and supinator.

Inclusion body myositis, an inflammatory myopathy, would present with bilateral often asymmetrical weakness, which has a tendency to affect distal musculature. The tendon reflexes would be normal and the creatine kinase would be normal or mildly elevated.

Motor neurone disease presents with upper and lower motor signs in absence of sensory disturbance.

A steroid induced myopathy would cause proximal weakness and wasting with normal reflexes and sensation.



[Q: 4196] OnExamination 2012 - Neurology

A 22-year-old man suffers a deep laceration to the forearm resulting in transection of the median nerve.

Following this injury, the nerve will undergo which of the following pathological processes?

- 1- Chronic inflammation
- 2- Coagulative necrosis
- 3- Fibrinoid necrosis
- 4- Segmental demyelination
- 5- Wallerian degeneration

Answer & Comments

Answer: 5- Wallerian degeneration

Wallerian degeneration is degeneration of the portion of the nerve distal to the injury. It occurs following axonal injury in both the peripheral and central nervous systems and usually begins within 24-36 hours of injury.

Coagulative necrosis is cell death following ischaemia or infarction. It is characterised by a 'ghostly' appearance of affected cells under light microscopy.

Fibrinoid necrosis is a form of necrosis in which there is an accumulation of material in the affected tissue with a staining pattern reminiscent of fibrin. It is associated with Henoch-Schönlein purpura, malignant hypertension and hyperacute transplant rejection.

Segmental demyelination is a feature seen in axons in the central nervous system with multiple sclerosis.



[Q: 4197] OnExamination 2012 - Neurology

Which of the following is true regarding sensory neural hearing loss?

- 1- Approximately 1 per 1000 children will have greater than 40db hearing loss.
- 2- The incidence is half as high in babies admitted to neonatal intensive care units compared with the normal population.

- 3- The risk is increased in children who have had post-natal rubella.
- 4- The risk is increased in Down's syndrome.
- 5- The risk is increased in Werdnig-Hoffman syndrome.

Answer & Comments

Answer: 1- Approximately 1 per 1000 children will have greater than 40db hearing loss.

Sensory neural hearing loss is caused by lesions in the cochlea or the auditory nerve or central connections. It may be unilateral or bilateral. Language acquisition and secondary educational difficulties follow, with social isolation, and an increased risk of mental health problems. The approximate incidence is 1 per 1000 children.

Risk factors include:

Neonatal intensive-care unit (NICU) admission: low birth weight, less than 32 weeks gestation, prolonged ventilation, prolonged jaundice, ototoxic drugs, hypoxic ischaemic encephalopathy, neonatal meningitis

Congenital infection (rubella, cytomegalovirus [CMV])

Dysmorphic syndromes (affecting head and neck)

Family history of a close relative needing a hearing aid below the age of 5 years

Infections: acute bacterial or TB meningitis, mumps (latter usually unilateral).

If all risk factors are considered, only around 50% of cases could be identified by testing between 5 and 10% of all babies.

Conductive hearing loss is related to middle ear pathology. This is commoner in Down's syndrome, cleft palate, Turner's syndrome, and facial malformation syndromes.

Werdnig-Hoffman is associated with normal hearing.



[Q: 4198] OnExamination 2012 - Neurology

A 35-year-old female presents with headaches.

Examination reveals papilloedema.

Which of the following would make the diagnosis of benign intracranial hypertension (BIH) unlikely?

- 1- Absence of retinal venous pulsations
- 2- Bilateral upgoing plantar responses
- 3- Normal ventricles on CT or MRI scan
- 4- Reduced visual acuity
- 5- Sixth cranial nerve palsy

Answer & Comments

Answer: 2- Bilateral upgoing plantar responses

BIH is typically associated with papilloedema, reduced venous pulsation and normal appearances of the magnetic resonance imaging (MRI).

A VIth nerve palsy is a recognised association.

Reflexes are preserved and plantars are flexor.

Extensor plantars suggest a alternative diagnosis.



[Q: 4199] OnExamination 2012 - Neurology

A 54-year-old female is admitted with progressive weakness following a trivial flu-like illness.

Which of the following would exclude Guillain-Barre syndrome (GBS) as the diagnosis?

- 1- Autonomic dysfunction

- 2- Elevated protein on CSF examination
- 3- Evidence of muscle wasting
- 4- Ophthalmoplegia
- 5- Sensory level below T1

Answer & Comments

Answer: 5- Sensory level below T1

GBS is a post-infectious acute polyneuritis typified by elevated cerebral spinal fluid (CSF) protein with few cells and often normal glucose.

There is a profound weakness associated with areflexia and peripheral sensory neuropathy.

Ophthalmoplegia is associated in particular with the Miller-Fisher variant.

However, a sensory level is not a feature and would suggest cervical myelopathy.

Muscle wasting is typical with prolonged illness.

Autonomic disease may also feature.



[Q: 4200] OnExamination 2012 - Neurology

A 21-year-old man recovered from the immediate effects of a head injury sustained in a motor cycle accident three months previously.

Which one of the following is the most likely delayed consequence of severe traumatic brain injury?

- 1- Episodic hypersomnia
- 2- Multiple obsessional symptoms
- 3- Outbursts of aggressive behaviour
- 4- Pathological jealousy
- 5- Persistent anxiety

Answer & Comments

Answer: 5- Persistent anxiety

The condition is post-concussion syndrome and although many of the symptoms given may be seen the commonest one (headache) has been left out.

The most common symptoms are headache and neck discomfort; changes in memory, concentration, and attention; dizziness; irritability, depression or anxiety; and sleep disturbance, among other symptoms.

There is:

Disturbance of thought

Poor concentration span and

Subjects are easily distracted.

Anxiety would seem the most common and therefore the most likely answer.



[Q: 4201] OnExamination 2012 - Neurology

A 65-year-old woman with 12 hour history of unsteady gait of sudden onset associated with vomiting and headache.

Following this she had increasing drowsiness.

What is the diagnosis?

- 1- Acute subdural haemorrhage
- 2- Cerebellar haemorrhage.
- 3- Frontal subdural empyema
- 4- Herpes simplex encephalitis.
- 5- Pituitary apoplexy.

Answer & Comments

Answer: 2- Cerebellar haemorrhage.

The history is very typical of cerebellar haemorrhage.

The drowsiness suggests the presence of hydrocephalus, a common complication of cerebellar haemorrhage.



[Q: 4202] OnExamination 2012 -
Neurology

A 60-year-old man awakens with painless loss of vision of his left eye.

Three years earlier he had suffered a similar episode involving the right eye. Visual loss in that eye has been stationary. He does not complain of any systemic symptoms.

What is the most likely diagnosis?

- 1- Acute angle-closure glaucoma
- 2- Arteritic ischaemic optic neuropathy
- 3- Compressive optic neuropathy
- 4- Nonarteritic ischaemic optic neuropathy
- 5- Optic neuritis

Answer & Comments

Answer: 4- Nonarteritic ischaemic optic neuropathy

Sudden onset of painless monocular visual loss in patients aged 50 or more is commonly due to ischaemic optic neuropathy.

Commonly the symptoms are first noticed upon awakening in the morning. The other eye may suffer a similar event within five years.

There are no systemic features (weight loss, lethargy, malaise, jaw claudication, scalp tenderness) to suggest arteritic ischaemic optic neuropathy (giant cell arteritis). In giant cell arteritis, the other eye is usually affected within four weeks.

Optic neuritis is unlikely in a man of this age who had painless loss of vision.

In older persons it is due to ischemia, which can be arteritic or non-arteritic. Non-arteritic anterior ischemic optic neuropathy based on cardiovascular risk factors essentially. Arteritic AION is concern with temporal arteritis which has a typical prodrome of jaw claudication, scalp tenderness and headaches



[Q: 4203] OnExamination 2012 -
Neurology

Which of the following is caused by a lesion of the parietal lobe?

- 1- Bitemporal hemianopia
- 2- Homonymous inferior quadrantanopia
- 3- Perseveration
- 4- Primitive reflexes
- 5- Wernicke's (receptive) aphasia

Answer & Comments

Answer: 2- Homonymous inferior quadrantanopia

Lesions of the frontal lobe include

Difficulties with task sequencing and executive skills

Expressive aphasia (receptive aphasia, a temporal lobe lesion)

Primitive reflexes

Perseveration (repeatedly asking the same question or performing the same task)

Anosmia

Changes in personality.

Lesions of the parietal lobe include

Apraxias

Neglect

Astereognosis (unable to recognise an object by feeling it)

Visual field defects (typically homonymous inferior quadrantanopia).

They may also cause acalculia (inability to perform mental arithmetic).

Lesions of the temporal lobe cause

Visual field defects (typically homonymous superior quadrantanopia)

Wernicke's (receptive) aphasia

Auditory agnosia

Memory impairment.

Occipital lobe lesions include

Cortical blindness (blindness due to damage to the visual cortex and may present as Anton syndrome where there is blindness but the patient is unaware or denies blindness)

Homonymous hemianopia

Visual agnosia (seeing but not perceiving objects - it is different to neglect since in agnosia the objects are seen and followed but cannot be named).



[Q: 4204] OnExamination 2012 - Neurology

A 76-year-old male presents with cognitive impairment and is diagnosed with dementia.

Which of the following is the most probable cause of the dementia?

- 1- Alzheimer's disease
- 2- Creutzfeldt-Jacob disease
- 3- Lewy body dementia
- 4- Pick's disease
- 5- Vascular dementia

Answer & Comments

Answer: 1- Alzheimer's disease

Dementia is a clinical state characterised by loss of function in multiple cognitive domains beyond what might be expected from normal aging.

Particularly affected areas may be memory, attention, language, and solving.

The most common form of dementia, Alzheimer's disease, accounts for 50-75% of all cases of dementia. The presenting symptom is usually forgetfulness for newly acquired information. As the disease

progresses there is disorientation and progressive cognitive decline with personality disruption.

Another 20-30% is due to blood vessel disease (multi-infarct dementia), and approximately 20% is dementia with Lewy Bodies. Frontotemporal dementia (Pick's disease) accounts for 5% of cases. The remaining cases result from a variety of less common disorders, including Creutzfeldt-Jacob disease, progressive supranuclear palsy, Huntingdon's disease and AIDS associated dementia.



[Q: 4205] OnExamination 2012 - Neurology

A 24-year-old female presents with vague frontal headaches and visual disturbance.

She has a past history of acne for which she is receiving treatment. Examination reveals her to be obese with a blood pressure of 110/70 mmHg. There is absence of the central retinal vein pulsation on fundoscopic examination.

Which of the following drugs account for these findings?

- 1- Ampicillin
- 2- Dianette
- 3- Erythromycin
- 4- Isotretinoin
- 5- Topical tetracycline

Answer & Comments

Answer: 2- Dianette

Dianette, like any oral contraceptive, may be associated with benign intracranial hypertension (BIH).

Topical tetracycline is not associated with BIH.

Rarely BIH has been associated with isotretinoin but usually in combination with a tetracycline.



[Q: 4206] OnExamination 2012 -
Neurology

A 31-year-old woman presents to the Emergency department following a witnessed first ever seizure. She is drowsy and confused postictally.

A CT brain shows petechial haemorrhages in the right hemisphere. An MRI shows cerebral venous sinus thrombosis.

Which of the following would be the best initial treatment?

- 1- Antibiotics
- 2- Aspirin
- 3- Heparin
- 4- Supportive management
- 5- Vitamin K

Answer & Comments

Answer: 3- Heparin

Venous sinus thrombosis is more common in young women.

It may present with headaches or symptoms of raised intracranial pressure.

It can cause seizures.

The underlying problem is a thrombosis and the petechial haemorrhages are caused by venous outflow blockage. It is therefore important that anticoagulation is started immediately to relieve the cause.

Heparin is the most appropriate anticoagulant to use in this circumstance.

A. Antibiotics are not the best answer. The underlying cause may be infection and it would be important to look for this and treat it. However, there is no sign of this in this case. It would be most important here to get on and treat the thrombosis.

B. Aspirin is not the best answer. The clot is venous therefore heparin is more appropriate.

C. Heparin is the correct answer.

D. Supportive management is not the best answer. The underlying thrombosis should be treated to relieve symptoms. The petechial haemorrhages should not put you off anticoagulating the patient.

E. Vitamin K is not the correct answer. The underlying problem is a clot which should be treated. Vitamin K can sometimes be used to treat coagulopathies in deficient patients; however that is not applicable here. The haemorrhages are secondary to the venous outflow blockage.



[Q: 4207] OnExamination 2012 -
Neurology

A 40-year-old male presents with abnormal movements.

On examination the patient has slow writhing movements of the arms and is unable to sit still in the chair without abnormal posturing. His father was reported to have had similar features at the age of 50 and died aged 60.

The pathophysiology of the disease described is similar to which of the following?

- 1- MELAS syndrome (mitochondrial encephalomyelopathy, lactic acidosis and stroke-like episodes)
- 2- Motor neuron disease
- 3- Myasthenia gravis
- 4- Myotonic dystrophy
- 5- Rheumatic fever

Answer & Comments

Answer: 4- Myotonic dystrophy

MELAS syndrome is a mitochondrial cytopathy caused by defects in the mitochondrial genome.

Motor neuron disease is a disorder of motor neurons the pathophysiology of which is

unclear but which is in some cases related to SOD-1 gene.

Myasthenia gravis is an autoimmune condition in which antibodies, typically anticholinesterase antibodies, interfere with neuromuscular transmission.

Rheumatic fever can present with choreiform movements (Sydenham's chorea) but it is caused by Group A Streptococci and antibody cross-reactivity.

Myotonic dystrophy and huntington's disease are both trinucleotide repeat expansions. DM is CTG and HD is CAG



[Q: 4208] OnExamination 2012 - Neurology

The Achilles reflex is supplied by which of the following?

- 1- L5
- 2- L5/S1
- 3- S1
- 4- S1/S2
- 5- S2

Answer & Comments

Answer: 3- S1

The L5 reflex is tested by tapping the medial hamstrings, but is typically cumbersome to do and not tested.

It is the asymmetry which is important as it is not necessarily present.

S2 reflex is part of the anocutaneous reflex or anal wink.



[Q: 4209] OnExamination 2012 - Neurology

A mother comes to your office concerned about her 2-year-old son.

She has noticed that he typically laughs inappropriately for no particular reason.

Shortly after an event he appears to be fidgeting. These events last only minutes and in between the events he acts normally. You suspect gelastic seizures.

From where do these typically arise?

- 1- Brainstem
- 2- Frontal lobes
- 3- Hypothalamus
- 4- Pineal gland
- 5- Temporal lobe

Answer & Comments

Answer: 3- Hypothalamus

Automatisms can be seen in temporal lobe seizures.

Frontal lobe involvement in neurodegenerative disease can cause emotional lability.

The pineal gland is involved in melatonin release.

If this were brainstem you would expect to see cranial nerve involvement which is not mentioned in the case.



[Q: 4210] OnExamination 2012 - Neurology

What is the likelihood of controlling seizures in a patient never previously on anti-epileptic medication with a single anti-convulsant agent?

- 1- 12%
- 2- 32%
- 3- 47%
- 4- 64%
- 5- 82%

Answer & Comments

Answer: 3- 47%

A study of patients with previously untreated epilepsy demonstrated that 47% achieved control of seizures with the use of their first single drug.

Fourteen per cent became seizure-free during treatment with a second or third drug.

An additional 3% became seizure-free with the use of two drugs simultaneously.

Reference:

Early identification of refractory epilepsy. NEJM 2000; 342(5):314-319



[Q: 4211] OnExamination 2012 - Neurology

A 70-year-old man presents with difficulty speaking.

He has a history of diabetes, hypertension, hypercholesterolaemia, chronic obstructive pulmonary disease. He is currently on aspirin, simvastatin, amlodipine and hydrochlorothiazide. On examination the patient is awake, his blood pressure is 150/70 mmHg. His pulse is irregularly irregular.

He has 4/5 strength in the right arm and leg and 5/5 strength on the left. When asked to point to the window he does this correctly. When told to raise his arms and place his hands out he is seen to have a pronator drift on the right. He is shown a pen and asked what it is. He is unable to identify it by name. He is asked to use it appropriately and begins to write on a piece of paper. When asked to repeat 'Today is a sunny day', he is able to do so.

What type of dysphasia is this consistent with?

- 1- Anomic aphasia
- 2- Broca's aphasia
- 3- Conduction aphasia
- 4- Transcortical motor aphasia
- 5- Transcortical sensory aphasia

Answer & Comments

Answer: 1- Anomic aphasia

In Broca's or non-fluent or expressive aphasia the patient is unable to name objects with poor comprehension and repetition. It localises to the Broca's area in the left posterior inferior frontal gyrus.

An injury to the anterior superior frontal lobe results in transcortical motor aphasia with good comprehension but poor verbal output with the exception of echolalia or repetition. Writing is usually also impaired. Repetition is also spared as the arcuate fasciculus is not involved.

Conduction aphasia has poor repetition and naming but intact comprehension and fluent verbal output.

It is different to the transcortical sensory and motor aphasia in that there is intact comprehension and fluency which are not seen in each of the transcortical aphasiae respectively.



[Q: 4212] OnExamination 2012 - Neurology

A 47-year-old man is admitted to the Emergency department after collapsing following a cricket match in his village. He was apparently hit on the head with the ball whilst batting, but got up afterwards.

During the following 30 minutes he became increasingly confused, drowsy and then unresponsive, slumped in a chair. On examination his BP is elevated at 180/110 mmHg, with a pulse of 58. His GCS is 6. He is intubated and ventilated.

Which of the following is the most appropriate treatment?

- 1- IV acetazolamide
- 2- IV alteplase
- 3- IV furosemide
- 4- IV heparin

5- IV mannitol

Answer & Comments

Answer: 5- IV mannitol

The history is classical for an extradural haemorrhage, and the clinical picture is consistent with raised intracranial pressure.

As such the initial treatment of choice is IV mannitol; it leads to reduced intracranial pressure and improves cerebral blood flow.

Hyperventilation is also considered to further reduce intracranial pressure whilst awaiting neurosurgical intervention.



[Q: 4213] OnExamination 2012 - Neurology

A 28-year-old man comes to the surgery complaining that he has begun waking from sleep in the early hours of the morning, unable to move. He is very distressed by this and is worried that he will become paralysed.

Additionally, he has begun to suffer from excessive sleepiness during the day and fell asleep once whilst out for dinner with a new girlfriend during the middle of the meal.

On examination his BP is 132/70 mmHg, pulse is 72 and regular. Neurological examination is entirely normal.

Investigations show

Haemoglobin 13.2 g/dl(13.5-18)

White cell count $6.0 \times 10^9/L$ (4-10)

Platelets $189 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (134-143)

Potassium 4.3 mmol/l (3.5-5)

Creatinine 110 $\mu\text{mol/l}$ (60-120)

Which of the following best describes the condition he suffers when he wakes from sleep?

1- Hypnagogic hallucinations

2- Restless legs syndrome

3- Sleep apnoea

4- Sleep paralysis

5- Sleep terrors

Answer & Comments

Answer: 4- Sleep paralysis

This patient has a history of sleep paralysis, excessive daytime somnolence and cataplexy. This triad of symptoms is suggestive of an underlying diagnosis of narcolepsy.

Diagnosis is a clinical one, supported by an overnight polysomnogram and multi sleep latency test.

Sleep hygiene is important in the management of the condition, with CNS stimulants being the main option with respect to pharmacological management.

Non-amphetamine based agents, such as modafinil, are the treatment of choice.



[Q: 4214] OnExamination 2012 - Neurology

A 32-year-old woman has presented to the emergency department for the third time with abdominal pain which typically lasts several days. The previous two occasions she has been discharged home without a firm diagnosis. Between episodes the patient is symptom free. She complains of feeling anxious.

She has recently re-started the combined oral contraceptive pill after completing her family.

On examination she is anxious and hypertensive at 155/98 mmHg with a pulse of 102. She has no rashes. Her abdomen is diffusely tender.

Investigations show

Haemoglobin 12.8 g/dl(13.5-18)

White cell count $8.1 \times 10^9/L$ (4-10)

Platelets $220 \times 10^9/L$ (150-400)

Sodium 135 mmol/l (134-143)

Potassium 3.9 mmol/l (3.5-5)

Creatinine 100 µmol/l (60-120)

Which of the following is the most likely diagnosis?

- 1- Acute intermittent porphyria
- 2- Appendicitis
- 3- Depression
- 4- Porphyria cutanea tarda
- 5- Variegate porphyria

Answer & Comments

Answer: 1- Acute intermittent porphyria

Acute intermittent porphyria (AIP) is a rare disorder characterised by abdominal pain and neuropsychiatric symptoms which usually presents in the 20-40 age group. Rash is not a feature of AIP like other porphyrias. Hypertension and tachycardia are common examination findings.

The progesterone component of the combined oral contraceptive pill is known to precipitate porphyria attacks. Many other drugs have been described in association with an attack.



[Q: 4215] OnExamination 2012 - Neurology

A 59-year-old woman presents with polysymptomatology. On examination she has prominent fasciculations.

From which of the following conditions is she unlikely to suffer?

- 1- Cervical spondylosis
- 2- Motor neurone disease
- 3- Multiple sclerosis
- 4- Spinal muscular atrophy
- 5- Thyrotoxicosis

Answer & Comments

Answer: 3- Multiple sclerosis

Fasciculations suggest lower motor neurone disease. Fasciculations may be seen in otherwise normal individuals with no muscular weakness/atrophy. If pronounced and combined with muscle atrophy they usually signify motor neurone disease (MND).

They may also be seen in diseases that involve

Spinal cord grey matter

Lesions of anterior roots

Peripheral neuropathies.

They may also be seen with severe metabolic disturbance, dehydration, thyrotoxicosis, but not in demyelinating disease of the central nervous system.



[Q: 4216] OnExamination 2012 - Neurology

Which of the following anatomical considerations is correct?

- 1- Optic chiasm lesions characteristically produce a bitemporal hemianopia
- 2- The physiological blind spot is unaffected by papilloedema
- 3- In cortical blindness pupillary reactions are abnormal
- 4- Optic tract lesions produce an ipsilateral homonymous hemianopia
- 5- Cerebellar lesions cause horizontal nystagmus

Answer & Comments

Answer: 1- Optic chiasm lesions characteristically produce a bitemporal hemianopia

B. The physiological blind spot is enlarged in papilloedema as peripapillary photoreceptors are displaced.

- C. In cortical blindness, pupillary reflexes, eye movements and fundoscopy are all normal.
- D. Optic tract lesions produce an contralateral homonymous hemianopia.
- E. Horizontal nystagmus occurs in unilateral disease of the cerebral hemisphere, with the fast phase directed to the side of the lesion.



[Q: 4217] OnExamination 2012 - Neurology

A 29-year-old female presents with drooping of the left side of her face and an inability to close her left eye. She had a viral illness in the preceding week. There is no past medical history.

On examination, there is a left VIIth nerve palsy. The remaining cranial nerves are normal. Power, tone and reflexes are normal in the limbs.

What is the best course of treatment?

- 1- Intravenous immunoglobulin
- 2- No treatment
- 3- Oral Augmentin
- 4- Oral prednisolone
- 5- Oral valaciclovir and prednisolone

Answer & Comments

Answer: 4- Oral prednisolone

This is the classical history of a post-viral Bell's palsy.

There is some evidence to support a short course of steroids in the acute stages of the illness (NEJM 2007;357:1598-1607). This study suggests improved recovery of facial function with early treatment. No benefit was seen in aciclovir added to prednisolone in this study.

Oral valaciclovir has been evaluated with an RCT but consensus supports steroids (with some clinicians continuing to support the concomitant use of aciclovir).

You need to be confident that there are no features of Guillain-Barré (test reflexes), or brain stem vascular disease or space occupying lesion. The neurological examination of the cranial nerves thus needs to be completed with care.



[Q: 4218] OnExamination 2012 - Neurology

A 72-year-old male presents with weakness and reduced mobility.

On examination he has a slow gait with reduced arm swing and a tremor is noticed in the left arm.

Which of the following is the typical frequency of the rest tremor in Parkinson's disease?

- 1- 2 Hz
- 2- 4 Hz
- 3- 8 Hz
- 4- 10 Hz
- 5- 12 Hz

Answer & Comments

Answer: 2- 4 Hz

The tremor of Parkinson's disease is a rest tremor with low to moderate frequency 3 to 6 Hz.

Initially, the tremor is usually one-sided. As the disease progresses, the tremor becomes bilateral and increases in severity.

Although the classical tremor of Parkinson's disease is a rest tremor, over time an action tremor may develop. Furthermore, it may increase in severity with levodopa.



[Q: 4219] OnExamination 2012 - Neurology

A 55-year-old female presents with tremor of the hands which has been present for approximately five years.

She has a past medical history which includes anxiety and she receives salbutamol for asthma.

Examination revealed titubation and an upper limb postural tremor.

What is the most likely diagnosis?

- 1- Anxiety disorder
- 2- Benign essential tremor
- 3- Multiple sclerosis
- 4- Parkinson's disease
- 5- Salbutamol induced tremor

Answer & Comments

Answer: 2- Benign essential tremor

Anxiety and drugs (for example, salbutamol, sodium valproate, theophylline, amiodarone) are commonly associated with tremor of the limbs.

However, head tremor (titubation) is unusual. Essential tremor is the commonest cause of head tremor.

Parkinson's disease is associated with rest tremor but not titubation.

Multiple sclerosis is associated with titubation and intention tremor.



[Q: 4220] OnExamination 2012 - Neurology

A 40-year-old man has had decreased mentation with confusion as well as increasing incoordination and loss of movement in his right arm over the past six weeks.

An MRI scan shows 0.5 to 1.5 cm lesions in cerebral hemispheres in white matter and at the grey-white junction that suggest demyelination.

A stereotactic biopsy is performed, and immunohistochemical staining of the tissue reveals JC papovavirus in oligodendrocytes.

Which of the following laboratory test findings is most likely to be associated with these findings?

- 1- CD4 lymphocyte count of 90/microlitre
- 2- Haemoglobin A1c of 9.8%
- 3- HDL cholesterol of 0.7 mmol/L
- 4- Oligoclonal bands in CSF
- 5- Serum sodium of 110 mmol/L

Answer & Comments

Answer: 1- CD4 lymphocyte count of 90/microlitre

The findings are those of progressive multifocal leukoencephalopathy (PML), which is a condition that can develop in immunocompromised patients, such as those with AIDS.

PML is associated with papova (JC) virus infection.



[Q: 4221] OnExamination 2012 - Neurology

Which of the following is correct regarding herpes simplex encephalitis?

- 1- Is associated with a polymorphonuclear pleocytosis in the CSF
- 2- Produces a diffuse, evenly distributed inflammation of cerebral tissues
- 3- Produces a typical EEG pattern with lateralised periodic discharges at 2 Hz
- 4- Should be treated with acyclovir as soon as the diagnosis is confirmed by urgent CSF viral antibody titres
- 5- Shows a peak incidence in the autumn

Answer & Comments

Answer: 3- Produces a typical EEG pattern with lateralised periodic discharges at 2 Hz

This EEG pattern is seen but is not diagnostic.

Winter is the peak incidence.

A lymphocytosis is characteristic in the cerebrospinal fluid (CSF).

Temporal lobe location is typical not diffuse.

Immediate treatment is required on clinical suspicion - do not wait!



[Q: 4222] OnExamination 2012 - Neurology

A 50-year-old lady suffers with migraine. She smokes 20 cigarettes a day.

She has found that paracetamol 1 g was not always effective in relieving her pain.

Which of the following factors is the most likely to account for this problem?

- 1- Altered volume of distribution
- 2- Delayed gastric emptying
- 3- First pass metabolism
- 4- Hepatic enzyme induction
- 5- Reduced gut blood flow

Answer & Comments

Answer: 2- Delayed gastric emptying

Paracetamol absorption is reduced during migraine attacks and reduced absorption is associated with increased nausea.

There is evidence that delayed gastric emptying is to blame. (Tokola RA, Neuvonen PJ. Effect of migraine attacks on paracetamol absorption. Br J Clin Pharmacol 1984 Dec;18(6):867-71).

In fact the paracetamol absorption technique is used to study gastric emptying.

Enzyme induction with cigarette smoking does affect paracetamol metabolism. Its importance however, is in toxicity. Smokers would be classified as in a high risk for paracetamol overdose and are assessed using a different time - paracetamol level curve.



[Q: 4223] OnExamination 2012 - Neurology

A young teenager presents with fever and headache. He has received oral amoxicillin for three days.

Which of the following cerebrospinal fluid (CSF) findings would virtually exclude a partially treated bacterial meningitis?

- 1- A CSF glucose of 45% of blood glucose
- 2- A negative CSF culture
- 3- A negative Gram stain
- 4- A negative Kernig's sign
- 5- A white cell count of 3

Answer & Comments

Answer: 5- A white cell count of 3

The assessment of children with suspected bacterial meningitis who have already received antibiotic therapy from their GP is a common diagnostic problem.

Partial treatment may reduce the incidence of positive CSF Gram stains to less than 60%, and it also reduces the ability to grow the bacteria, particularly meningococcus.

CSF glucose, protein, neutrophils and bacterial antigen testing or polymerase chain reaction (PCR) should be completely unaffected. A normal white cell count would make the diagnosis very unlikely.

CSF glucose is usually > 65% of blood glucose.



[Q: 4224] OnExamination 2012 - Neurology

Which one of the following is associated with parkinsonian features?

- 1- Chronic carbon dioxide retention
- 2- Kernicterus
- 3- Lead poisoning
- 4- Mercury poisoning

5- Wilson's disease

Answer & Comments

Answer: 5- Wilson's disease

Poisons that can cause parkinsonism include:

Manganese

Carbon monoxide

Carbon disulfide

The cycad nut and

The illicit drug MPTP (methyl-phenyl tetrahydropyridine).

There are also other diseases of the brain that combine parkinsonism.

These include:

Wilson's disease

Huntington's disease

Shy-Drager syndrome

Striatonigral degeneration

Olivo-ponto-cerebellar degeneration

Cortical-basal ganglionic degeneration

Progressive supranuclear palsy

Diffuse Lewy body disease

Creutzfeldt-Jacob disease and even

Alzheimer's disease.



[Q: 4225] OnExamination 2012 - Neurology

A 25-year-old woman presents with a severe migraine.

Which of the following is not a recognised feature of migraine?

- 1- Bilateral fortification spectra
- 2- External ophthalmoplegia
- 3- Precipitation by oral contraceptives

4- Some symptoms improved by tricyclic antidepressants

5- Third nerve palsy

Answer & Comments

Answer: 2- External ophthalmoplegia

Fortification spectra (jagged lines resembling battlements) and teichopsia (flashes) are common. Tricyclics can be useful for nausea.

Third nerve palsy is seen in ophthalmoplegic migraine.

Chronic progressive external ophthalmoplegia usually develops in childhood and is associated with ptosis, fatigue and limitation to eye- movements in all directions.

The disorder is in the cytochromes.



[Q: 4226] OnExamination 2012 - Neurology

Which of the following statements regarding CADASIL (cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy) is correct?

- 1- Computerised tomography (CT) of the brain is diagnostic
- 2- Death usually occurs in infancy
- 3- It is associated with an abnormality of the X chromosome
- 4- It may present with migraine
- 5- The thalami are usually spared

Answer & Comments

Answer: 4- It may present with migraine

CADASIL is a diffuse disease of small arteries, predominantly in the brain.

It starts during mid adulthood and is characterised by:

Recurrent ischaemic events (transient or permanent)

Attacks of migraine with aura

Severe mood disorders

Sub-cortical dementia and

A wide spread leukoencephalopathy on magnetic resonance imaging (MRI).

CT brain is not diagnostic. Characteristic MRI changes include T2 weighted hyperintensity of the periventricular white matter.

A family history is almost always present, as it is an autosomal dominant condition, located to chromosome 19.

Infarcts are subcortical, and the thalami and basal ganglia are usually involved.



[Q: 4227] OnExamination 2012 - Neurology

A 39-year-old man is referred by his optician with a central scotoma found in his right eye during a routine eye test.

On examination of his cranial nerves he is poorly compliant and keeps laughing. He says he is unable to smell anything and that he can no longer read as well as he would like. On fundoscopy his left fundus is hyperaemic and oedematous. You are unable to obtain clear views of his right fundus.

Which of the following is the most likely diagnosis?

- 1- Drug abuse
- 2- Foster Kennedy's syndrome
- 3- Kallman's syndrome
- 4- Leber's hereditary optic neuropathy
- 5- Leigh syndrome

Answer & Comments

Answer: 2- Foster Kennedy's syndrome

Foster Kennedy's syndrome is a combination of optic atrophy and central scotoma, contralateral papilloedema and anosmia.

It is caused by optic and olfactory nerve compression and raised intracranial pressure. This is often secondary to a mass such as an olfactory groove meningioma.

Patients may also have other symptoms of raised intracranial pressure such as nausea and vomiting, and frontal symptoms such as emotional lability and memory loss.

A. This is not the best answer. Whilst drug abuse may account for his abnormal affect it would not cause the other symptoms.

B. .

C. This is not the correct answer. This is characterised by hypogonadism and anosmia.

D. This is not the correct answer. This is a mitochondrial disorder causing visual loss in young men but would not account for his other symptoms.

E. This is not the correct answer. This is a rare neurometabolic disorder affecting the central nervous system.



[Q: 4228] OnExamination 2012 - Neurology

A 55-year-old man has progressive weakness of his hands over a period of one year.

Examination reveals wasting of the muscles of the hands and forearms and fasciculation. There is hyperreflexia of his lower limbs and upgoing plantars. Sensation is normal.

Which of the following is the most likely diagnosis?

- 1- Alzheimer's disease
- 2- Motor neurone disease
- 3- Multiple cerebral infarcts
- 4- Multiple sclerosis
- 5- Syringomyelia

Answer & Comments

Answer: 2- Motor neurone disease

There is a mixture of lower motor neurone signs in the upper arms and upper motor neurone signs in the legs. Cerebrovascular disease and Alzheimer's disease are therefore unlikely.

The history is of gradual onset over one year which makes multiple sclerosis less likely since it is usually abrupt in the onset of symptoms.

Syringomyelia is unlikely since sensation is unaffected.

This leaves motor neurone disease particularly of the amyotrophic lateral sclerosis type.



[Q: 4229] OnExamination 2012 - Neurology

A 70-year-old man presents with difficulty speaking.

He has a history of diabetes, hypertension, hypercholesterolaemia, chronic obstructive pulmonary disease. He is currently on aspirin, simvastatin, amlodipine and hydrochlorothiazide.

On examination the patient is awake, his blood pressure is 150/70 mmHg. His pulse is irregularly irregular. He has 4/5 strength in the right arm and leg and 5/5 strength on the left. When asked to point to the window he does this correctly.

When told to raise his arms and place his hands out he is seen to have a pronator drift on the right. He is shown a pen and asked what it is. He is unable to identify it by name and appears frustrated: applying much effort to speak a sentence. He is asked to use it appropriately and begins to write on a piece of paper but no makes no legible words despite being a retired journalist. When asked to repeat 'Today is a sunny day', he is unable to do so.

With which of the following is this type of dysphasia consistent?

- 1- Broca's aphasia
- 2- Global aphasia
- 3- Transcortical motor aphasia
- 4- Transcortical sensory aphasia
- 5- Wernicke's aphasia

Answer & Comments

Answer: 1- Broca's aphasia

In Wernicke's or fluent or receptive aphasia the patient is able to form correct grammatical sentences but language content is incorrect. It localises to the dominant superior temporal gyrus. There is poor comprehension and repetition but verbal output is fluent.

In transcortical motor aphasia which localises to the anterior superior frontal lobe, the patient is able to repeat and have good comprehension but is unable to express themselves and have halting, effortful speech with intact repetition.

Transcortical sensory aphasia has intact repetition but the patient is unable to follow verbal commands with fluent grammatical speech.

Global aphasia results in an almost mute patient: there is poor verbal output, comprehension, repetition and understanding.



[Q: 4230] OnExamination 2012 - Neurology

Which of the following statements is true of acute compartment syndrome?

- 1- Loss of distal pulse is an early sign.
- 2- Only occurs following fractures.
- 3- Passive stretch of affected muscles exacerbates pain.
- 4- Rarely requires surgical intervention.

- 5- The presence of pain is unhelpful in diagnosis.

Answer & Comments

Answer: 3- Passive stretch of affected muscles exacerbates pain.

- A. Loss of peripheral pulses is a late sign indicating that the pressure within the compartment has exceeded arterial blood pressure.
- B. Compartment syndrome can occur in the absence of a fracture, for examples, crush injuries.
- C. Passive stretch of the muscles traversing the compartment increases pain.
- D. Treatment involves decompression of the affected compartment(s) including the skin.
- E. Pain is the earliest and most reliable symptom of the onset of compartment syndrome.



[Q: 4231] OnExamination 2012 - Neurology

A 18-year-old male presents with blurring of vision in his right eye.

Examination reveals visual acuity in the right eye of 6/18 and in the left eye 6/6.

Visual fields to confrontation reveal a right temporal visual field defect and partial loss of superior part of the temporal field of the left eye.

Where is the most likely position of the lesion responsible for this defect?

- 1- Occipital lobe
- 2- Optic chiasm
- 3- Optic nerve
- 4- Optic tract
- 5- Temporal lobe

Answer & Comments

Answer: 2- Optic chiasm

The most likely localisation of the lesion is around the optic chiasm spreading up the right optic nerve. The signs indicate a bitemporal visual field defect with involvement of the right optic nerve (decreased visual acuity).

Occipital lobe lesion causes a congruous homonymous hemianopia whereas an optic tract lesion causes an incongruous homonymous hemianopia. Temporal lobe lesion causes an upper homonymous quadrantanopia. Optic nerve lesions in isolation lead to unilateral visual signs.

Visual fields See also references.



[Q: 4232] OnExamination 2012 - Neurology

A 40-year-old civil servant attends the clinic stating that she has difficulty swallowing.

She gives a two month history of difficulty with solids which has progressed to difficulty tolerating liquids in the previous two weeks. She has noticed some weakness in her right arm which has affected her ability to lift certain objects like the kettle. Previously, she has enjoyed good health with no hearing loss or facial weakness. She describes no visual symptoms.

On examination, she has an absent gag reflex on the right, with reduced palatal movements. There is weakness on rotating the head to the left with flattening and weakness of elevation of the right shoulder. Eye movements, visual acuity, hearing and tongue movements are all normal.

Where is the likely site of the lesion?

- 1- Left cerebello-pontine angle
- 2- Left jugular foramen
- 3- Right cerebello-pontine angle
- 4- Right jugular foramen

5- Right pons

Answer & Comments

Answer: 4- Right jugular foramen

The clinical scenario is that of a right sided pathology affecting the IX, X and XI cranial nerves.

This produces the palatal weakness and the swallowing difficulties (IX/X), while the shoulder and sternocleidomastoid weakness are due to accessory nerve (XI) involvement.

The absence of hearing loss or facial weakness makes a cerebello-pontine angle lesion unlikely.

A lesion outside the skull may also involve the XII nerve (tongue).

The most likely site, therefore is the jugular foramen.



[Q: 4233] OnExamination 2012 - Neurology

A 70-year-old woman presented with episodic impairment of consciousness.

Which of the following is the most likely cause?

- 1- Alzheimer type dementia
- 2- Chronic subdural haematoma
- 3- Creutzfeldt-Jakob disease
- 4- Depressive stupor
- 5- Normal pressure hydrocephalus

Answer & Comments

Answer: 2- Chronic subdural haematoma

This is quite a grey question. The clinical scenario is very brief with no mention of any neurological signs so a logical deduction must be made.

Alzheimer's disease would be expected to have a continuous impairment of

consciousness in its advanced stages but could be episodic if there were variation in drugs therapy or concurrent illnesses.

Similarly normal pressure hydrocephalus, Creutzfeldt-Jakob and depression would present with dementia (or apparent dementia) but not fluctuant.

Of all those listed, subdural haematoma is classically associated with fluctuating level of consciousness. This would make it the most likely.



[Q: 4234] OnExamination 2012 - Neurology

Which of the following statements regarding central pontine myelinolysis is correct?

- 1- Consciousness is preserved characteristically.
- 2- MR imaging shows diagnostic features in the majority of patients.
- 3- The cause has been linked to over-rapid correction of hyponatraemic states.
- 4- The condition is confined to malnourished alcoholic patients.
- 5- The pathological changes are confined to the pons.

Answer & Comments

Answer: 3- The cause has been linked to over-rapid correction of hyponatraemic states.

Central pontine myelinolysis is a common consequence of over-rapid correction of hyponatraemia.

Pathological changes are not confined to the pons (despite the name of the condition).

Magnetic resonance imaging (MRI) usually shows changes within the pons, however the appearances are not diagnostic.

Consciousness is usually impaired.

It can occur in malnourished alcoholic patients (but it is not confined to them).



[Q: 4235] OnExamination 2012 - Neurology

Which of the following clinical manifestations suggests Guillain-Barré (GB) syndrome?

- 1- Asymmetrical involvement of distal muscles
- 2- Brisk tendon reflexes
- 3- Bulbar involvement in about 50% of cases
- 4- Normal cerebrospinal fluid (CSF) protein
- 5- Weakness beginning in the arms

Answer & Comments

Answer: 3- Bulbar involvement in about 50% of cases

GB is a post-infectious polyneuropathy causing demyelination in mainly motor but also sensory nerves.

It usually follows a non-specific viral infection. Campylobacter and Mycoplasma are recognised causes.

Weakness begins in the legs and progressively ascends to involve the trunk, upper limbs and finally the bulbar muscles (Landry's ascending paralysis).

Asymmetry is present in only 9% of patients, with symmetrical involvement being typical. Usually there is painless progression over days or weeks, but in cases of abrupt onset, there may be tenderness or muscle pain.

Bulbar involvement occurs in 50%, with a risk of aspiration and respiratory insufficiency can be problematic.

In the Miller Fisher syndrome there is external ophthalmoplegia, ataxia and areflexia.

In 20% of cases there is urinary incontinence or retention.

Clinical symptoms usually improve within two to three weeks, though a chronic relapsing form is recognised.

CSF protein is elevated to more than twice the upper limit of normal, with normal glucose and no pleocytosis. Bacterial cultures are negative and viral cultures rarely isolate anything.

The dissociation between a high CSF protein and a lack of cellular response in a person with an acute or subacute polyneuropathy is diagnostic of Guillain-Barre syndrome.



[Q: 4236] OnExamination 2012 - Neurology

A 21-year-old female with epilepsy is well controlled on sodium valproate 600 mg twice daily and had been taking oral contraceptives for three years.

She presented to her general practitioner 12 weeks pregnant.

Which of the following is correct?

- 1- An alternative anticonvulsant should be used in place of sodium valproate
- 2- Interaction of sodium valproate with the oral contraceptive increased the risk of pregnancy
- 3- She is at increased risk of anaemia in pregnancy
- 4- The dose of sodium valproate should be increased
- 5- There is an increased risk of a neural tube defect in her fetus

Answer & Comments

Answer: 5- There is an increased risk of a neural tube defect in her fetus

There is an increased risk of neural tube defects associated with anticonvulsants during pregnancy.

However, the risks associated with treatment are outweighed by the benefits in preventing seizures, so the drug should be continued.

The risks may be minimised through use of folate supplements.

Sodium valproate is not an enzyme inducer and would not speed up metabolism of the pill.



[Q: 4237] OnExamination 2012 - Neurology

An 18-year-old man presented with a history of a sudden onset of a frontal headache and photophobia. He had neck stiffness and a temperature of 38°C.

Which one of the following findings would suggest a diagnosis of subarachnoid haemorrhage rather than bacterial meningitis?

- 1- A blood neutrophil leucocytosis
- 2- A family history of polycystic renal disease
- 3- A fluctuating conscious level
- 4- A history of diabetes mellitus
- 5- A history of opiate abuse

Answer & Comments

Answer: 2- A family history of polycystic renal disease

Fluctuating level of consciousness can occur in both meningitis and subarachnoid haemorrhage (SAH).

Hypertension is a risk factor for SAH, but not diabetes.

Opiate abuse does not increase the risk for SAH.

Cerebral aneurysms are associated with polycystic kidney disease.



[Q: 4238] OnExamination 2012 - Neurology

A 43-year-old man presented with diplopia of six weeks duration.

On examination he had normal corrected visual acuity in each eye, restriction of adduction of the right eye and nystagmus in the left eye on left lateral gaze.

What is the most likely diagnosis?

- 1- Brainstem demyelination
- 2- Graves' ophthalmopathy
- 3- Internal carotid artery aneurysm
- 4- Lateral medullary syndrome
- 5- Steele-Richardson syndrome

Answer & Comments

Answer: 1- Brainstem demyelination

The features are suggestive of internuclear ophthalmoplegia which is due to a lesion at the medial longitudinal fasciculus and in this male the most likely explanation is multiple sclerosis (MS).

Other causes include brainstem infarction, syphilis and Lyme disease.



[Q: 4239] OnExamination 2012 - Neurology

A 70-year-old man presents with weight loss, lower limb weakness and dry mouth. He has been a heavy smoker.

On examination he looks cachectic; he has proximal lower limb weakness, areflexia (reflexes normalise with repetitive muscle contraction). There is no wasting or fasciculations. Sensory examination is normal.

Which of the following blood tests is the most likely to confirm the diagnosis?

- 1- Acetylcholine receptors
- 2- Anti GM1 antibody
- 3- Antinuclear antibody

- 4- Anti Ro/La antibodies
5- Voltage gated calcium channels antibodies

Answer & Comments

Answer: 5- Voltage gated calcium channels antibodies

The most likely diagnosis is Lambert-Eaton syndrome. It results when IgG autoantibodies blockade the voltage-gated calcium channels of peripheral cholinergic nerve territory.

Fifty per cent of the cases are associated with small cell lung carcinoma.

Proximal lower limb weakness is the most consistent neurological feature.

Ptosis and ophthalmoplegia are rare. Autonomic dysfunction is common (for example, dry mouth).

The reflexes are depressed or absent but normalise with repetitive muscle contraction.



[Q: 4240] OnExamination 2012 - Neurology

You are seeing a patient with rheumatoid arthritis in clinic.

You are keen to commence methotrexate. Before consenting to start the treatment your patient wants to know how often she is going to require blood tests.

What will you advise her?

- 1- FBC, LFT and U&E monthly, including baseline levels
- 2- FBC, coagulation screen, U&E and rheumatoid factor weekly, includes baseline levels
- 3- FBC, uric acid, folate levels, U&E and LFT at baseline and then weekly until on stable dose of methotrexate and then every two to three months.
- 4- FBC, LFT and U&E at baseline and then weekly until on stable dose of

methotrexate and then every two to three months

- 5- FBC, coagulation screen, LFT and ESR at baseline and then weekly until on stable dose of methotrexate and then every month.

Answer & Comments

Answer: 4- FBC, LFT and U&E at baseline and then weekly until on stable dose of methotrexate and then every two to three months

Methotrexate is a potent immunosuppressant and therefore has many potential side effects about which patients need to be counselled and the clinician aware.

There have been cases of fatal blood dyscrasias with bleeding and severe bone marrow suppression, putting patients at risk of severe infection. Liver cirrhosis and toxicity are other possible complications. These toxic effects can be reduced by the concurrent use of folic acid (except on the day of taking the methotrexate).

Methotrexate can also cause lung fibrosis.

Patients are therefore advised to seek medical advice if they have sore throat and illness, easy bruising or bleeding, shortness of breath, abdominal pain and vomiting or jaundice. It should be documented in patient notes that this advice has been given.

The current recommendation is to check baseline liver function, renal function and full blood count. This should then be repeated weekly until on a stable dose of methotrexate, when it can then be reduced to every two to three months if there has been no change in blood results.

Methotrexate should be stopped immediately if there is a clinically significant drop in white cell count or platelet count.

If there is derangement of LFTs it should also be stopped, but may be reintroduced after a couple of weeks if the LFTs normalise, but only under specialist advice.



[Q: 4241] OnExamination 2012 -
Neurology

A 67-year-old woman presents with severe back pain and urinary retention with overflow.

She says that her lower back has been aching for the past six weeks, but the pain has become significantly worse over the past 48 hours.

There is a medical history of hypertension, but nothing else of note. Her BP is 142/82 mmHg, pulse is 73 and regular.

She is unable to get off the couch due to distal lower limb weakness. Tone is increased bilaterally and her reflexes are increased. As you chat to her you notice fasciculation. There is perianal loss of sensation.

Which of the following is the most likely diagnosis?

- 1- Anterior spinal artery aneurysm
- 2- Anterior spinal artery thrombosis
- 3- Cauda equina syndrome
- 4- Conus medullaris syndrome
- 5- Sacroiliitis

Answer & Comments

Answer: 4- Conus medullaris syndrome

Conus medullaris syndrome presents with mixed upper and lower motor neurone signs. These include bilateral distal weakness with increased tone and hyper-reflexia, fasciculation. Sensory loss is most marked in the perianal region. It is much rarer than cauda equina syndrome.

Spinal cord infarction related to anterior spinal artery disease presents most frequently with sudden onset pain and loss of

power and sensation beginning in the thoracic region. The symptoms seen here have slowly built up over a few weeks and affect a more distal spinal cord distribution.

Sacroiliitis would not be associated with neurological deficit.

Cauda equina syndrome is associated with flaccid paralysis.

Conus Medullaris Syndrome
Cauda Equina Syndrome

Presentation
Sudden and bilateral
Gradual and may be unilateral leg signs initially

Reflexes
Knee jerks preserved, ankle jerks affected
Both knee and ankle jerks affected

Radicular pain
Less severe
More severe

Sensory
Numbness often localised to perianal area, dissociation

can occur, usually bilateral and symmetrical
Numbness often localised to the saddle area, may be

asymmetrical and unilateral, sensory loss often dermatomal

Motor
Symmetrical, hyperreflexic
disal paresis, less marked than

cauda equina, may be fasciculations
Areflexic paraplegic, may be asymmetric, more marked than

conus medullaris, fasciculations rare, atrophy more common

Impotence
Frequent
Often less marked

Sphincter

dysfunction
Urinary retention and atonic anal sphincter present early in

disease (can cause overflow urinary incontinence)
Urinary retention, usually presents later in course of disease

Low back pain
More marked
Less marked



[Q: 4242] OnExamination 2012 -
Neurology

A 67-year-old woman is referred to a neurologist complaining of difficulty getting out of her chair.

She is noted to have discrete erythematous papules over her metacarpophalangeal joints. Her creatine kinase (CK) is 4000.

What is your diagnosis?

- 1- Dermatomyositis
- 2- Myasthenia gravis
- 3- Myotonic dystrophy
- 4- Polymyositis
- 5- Polyneuropathy

Answer & Comments

Answer: 1- Dermatomyositis

Dermatomyositis and polymyositis are related conditions that present with proximal muscle weakness.

Dermatomyositis has cutaneous signs such as Gottron's papules, discrete erythematous papules over metacarpophalangeal joints, and a heliotrope rash.

Regarding the options:

A is correct as the high CK, proximal muscle weakness and skin changes suggest dermatomyositis.

B and C are incorrect as they would not produce a predominantly proximal neuropathy.

D is incorrect as it is not associated with skin changes.

E is incorrect as it produces a distal rather than proximal neuropathy.



[Q: 4243] OnExamination 2012 -
Neurology

A 20-year-old man presents to the Emergency

department after punching a window.

He has lacerated the medial aspect of his wrist, damaging the ulnar nerve.

What is he at risk of developing?

- 1- Claw hand
- 2- Inability to pinch paper between his thumb and index finger
- 3- Loss of sensation over the lateral three and a half fingers
- 4- Wasting of the second lumbrical muscle
- 5- Wasting of the thenar eminence

Answer & Comments

Answer: 1- Claw hand

Ulnar nerve damage at the wrist results in wasting of the intrinsic hand muscles (other than the lateral two lumbricals) and the hypothenar eminence. This produces the classic claw hand. It supplies sensation to the medial one and a half fingers.

The median nerve innervates the lateral two lumbricals and the thenar eminence (opponens pollicis, abductor pollicis and flexor pollicis brevis). It supplies sensation to the lateral one and a half fingers.

Damage to the motor branch, the anterior interosseous nerve results in inability to form and pinch grip, tip to tip, instead holding the paper between the pulp of the thumb and index finger.



[Q: 4244] OnExamination 2012 -
Neurology

A 45-year-old woman presented with a severe sudden onset headache, describing it as the worst headache she could imagine, but denying any head trauma.

On examination of her cranial nervous system she had a partial ptosis of her right eye, which was unable to look up or medially, and her

right pupil was dilated. Her only past medical history is polycystic kidney disease.

What is the most likely diagnosis?

- 1- Subarachnoid haemorrhage caused by a ruptured right sided posterior communicating artery aneurysm
- 2- Subarachnoid haemorrhage caused by a ruptured left sided posterior communicating artery aneurysm
- 3- Subarachnoid haemorrhage caused by a ruptured right sided anterior communicating artery aneurysm
- 4- Subarachnoid haemorrhage caused by a ruptured left sided anterior communicating artery aneurysm
- 5- First presentation of cluster headache

Answer & Comments

Answer: 1- Subarachnoid haemorrhage caused by a ruptured right sided posterior communicating artery aneurysm

Posterior communicating artery aneurysms can compress the third cranial nerve. If the aneurysm ruptures it can cause the classic picture of an ipsilateral painful third nerve palsy, with the eye down and out, ptosis, and pupil dilation.

Cerebral aneurysms may be associated with polycystic kidney disease.

Regarding the options:

A is correct. It is the ipsilateral posterior communicating artery aneurysm that is compressing the third nerve.

B is incorrect as posterior communicating artery aneurysms do not cause contralateral compressive symptoms.

C and D are incorrect as anterior communicating artery aneurysms do not compress the third nerve.

E is incorrect as the presentation is of a subarachnoid haemorrhage.



[Q: 4245] OnExamination 2012 - Neurology

Imaging changes in frontotemporal dementia (FTD) start initially in which parts of the brain?

- 1- Corpus callosum
- 2- Dorsolateral prefrontal cortex and anterior cingulate
- 3- Hippocampus, parahippocampus
- 4- Orbitofrontal cortex and anterior cingulate
- 5- Prefrontal cortex and anterior thalamic nucleus

Answer & Comments

Answer: 4- Orbitofrontal cortex and anterior cingulate

Damage to the hippocampus and parahippocampus results in memory problems and has early involvement in Alzheimer's disease.

The corpus callosum can be involved in multiple sclerosis where so-called Dawson's fingers can be seen.

Prefrontal cortex damage can result in disinhibition and problems with social interaction and judgement and has been implicated in schizophrenia.



[Q: 4246] OnExamination 2012 - Neurology

A 30-year-old male presents to the emergency room with headache. He describes that for the last week he has been having shooting pains on one side of the face with associated tearing of that eye.

He reports that for the past week he has been having similar pains intermittently. He last had an attack three months ago which lasted two weeks. He is concerned he has a brain tumour.

On examination the sclera is injected and the patient appears uncomfortable. There is no neck stiffness, fundoscopy is unremarkable. Eye movements are intact, visual fields are full to direct confrontation and there is no proptosis.

What is the most likely diagnosis?

- 1- Cluster headache
- 2- Complicated migraine
- 3- Migraine with aura
- 4- Tension headache
- 5- Trigeminal neuralgia

Answer & Comments

Answer: 1- Cluster headache

Migraine with aura does not present like this.

Trigeminal neuralgia is a definite differential however it usually is associated with face pain and does not involve the eye or come in clusters.

A complicated migraine typically has long tract findings of sensorimotor involvement of the limbs.

This presentation is not typical for tension headache.



[Q: 4247] OnExamination 2012 - Neurology

A 70-year-old man presents with difficulty speaking.

He has a history of diabetes, hypertension, hypercholesterolaemia, chronic obstructive pulmonary disease. He is currently on aspirin, simvastatin, amlodipine and hydrochlorothiazide.

On examination the patient is awake; his blood pressure is 150/70 mmHg. His pulse is irregularly irregular. He has 4/5 strength on the right arm and leg and 5/5 strength on the left.

When asked to point to the window he does this correctly. When told to raise his arms and place his hands out he is seen to have a pronator drift on the right. He is shown a pen and asked what it is. He is unable to identify it by name and appears frustrated, applying much effort to speak a sentence. He is asked to use it appropriately and begins to write on a piece of paper but no makes no legible words despite being a retired journalist. When asked to repeat 'Today is a sunny day', he is able to do so.

With what type of dysphasia is this consistent?

- 1- Broca's aphasia
- 2- Global aphasia
- 3- Transcortical motor aphasia
- 4- Transcortical sensory aphasia
- 5- Wernicke's aphasia

Answer & Comments

Answer: 3- Transcortical motor aphasia

In Broca's or non-fluent or expressive aphasia the patient is unable to name objects with poor comprehension and repetition. It localises to the Broca's area in the left posterior inferior frontal gyrus.

In Wernicke's or fluent or receptive aphasia the patient is able to form correct grammatical sentences but language content is incorrect. It localises to the dominant superior temporal gyrus. There is poor comprehension and repetition but verbal output is fluent.

Transcortical sensory aphasia is similar to transcortical motor aphasia in that there is good repetition but comprehension and fluency are poor.

Global aphasia results in an almost mute patient: there is poor verbal output, comprehension, repetition and understanding.



[Q: 4248] OnExamination 2012 -
Neurology

A 71-year-old man attends the memory clinic with his wife. She has noticed that he has become progressively more forgetful over the past few years and has begun to wander at night. Most recently he became lost whilst shopping in the local village and had to be brought home by the police. This caused his wife significant distress.

On examination in the clinic he has easily demonstrable short-term memory loss, with relative preservation of memory for events from his 40s. He also has visuospatial dysfunction.

His BP is 142/72 mmHg, his pulse is 78 and regular. There are no murmurs or bruits on auscultation.

Investigations showed

Haemoglobin 12.9 g/dl(13.5-17.7)

White cells $7.4 \times 10^9/L$ (4-11)

Platelets $193 \times 10^9/L$ (150-400)

Sodium 141 mmol/l (135-146)

Potassium 4.6 mmol/l (3.5-5)

Creatinine 90 $\mu\text{mol/l}$ (79-118)

CT head Mild cortical atrophy

Which of the following is the most likely diagnosis?

- 1- Alzheimer's dementia
- 2- Lewy body dementia
- 3- Multi-infarct dementia
- 4- Pick's disease
- 5- Shy-Drager syndrome

Answer & Comments

Answer: 1- Alzheimer's dementia

Given the relatively insidious onset of this gentleman's memory loss, now accompanied by visuospatial dysfunction, his unremarkable cardiovascular examination and relatively

normal CT head, Alzheimer's dementia seems the most likely diagnosis.

There are no features particularly consistent with emotional lability to indicate Pick's disease, and no features of Parkinson's, which would be consistent with Lewy body dementia or Shy-Drager syndrome.

Prescription of cholinergic agonists depends on a mini-mental state score of between 10 and 20 points.



[Q: 4249] OnExamination 2012 -
Neurology

A 70-year-old woman presents with acute back pain followed by weakness of dorsiflexion of her left foot.

Where would you expect the associated sensory loss?

- 1- Anterior thigh
- 2- Dorsum of foot
- 3- Perineum
- 4- Posterior calf
- 5- Sole of foot

Answer & Comments

Answer: 2- Dorsum of foot

The features suggest an L5 radiculopathy which would be associated with a loss of sensation in the dorsum of the foot and big toe.



[Q: 4250] OnExamination 2012 -
Neurology

Genetic anticipation occurs characteristically in all the following conditions, except which?

- 1- Fragile X syndrome
- 2- Huntington's disease
- 3- Marfan's syndrome
- 4- Myotonia dystrophica
- 5- Spinocerebellar ataxia type 1

Answer & Comments

Answer: 3- Marfan's syndrome

Anticipation means increased severity/earlier age of onset of disease with successive generations.

Other conditions with anticipation include

Spinocerebellar ataxia type 1

Dentatorubral-pallidoluysian atrophy.



[Q: 4251] OnExamination 2012 - Neurology

A 50-year-old man has drunk six units of alcohol a day for most of his adult life.

He has worsening symptoms of difficulty walking, headaches and urinary incontinence for the past ten months.

Of the following which is the most likely diagnosis?

- 1- Encephalopathy
- 2- Meningovascular syphilis
- 3- Normal pressure hydrocephalus
- 4- Syringomyelia
- 5- Wernicke-Korsakoff syndrome

Answer & Comments

Answer: 4- Syringomyelia

There is no suggestion of memory loss so normal pressure hydrocephalus and Wernicke-Korsakoff syndrome are less likely.

Encephalopathy is more likely to be associated with symptoms of drowsiness.

Although meningovascular syphilis can present in many different forms it is rather rare.

Syringomyelia is associated with headaches, motor and bladder symptoms and is the likely diagnosis. There is syrinx (fluid-filled cavitation) in the central spinal cord, usually

cervical. This can elongate and enlarge, causing compression of the corticospinal and spinothalamic tracts and anterior horn cells. Syringobulbia describes the situation when the syrinx extends into the brainstem. The commonest cause is impaired cerebrospinal fluid circulation, usually due to a Chiari malformation (also associated with arachnoiditis, meningeal carcinomatosis, space-occupying lesions or idiopathic). It is more common in men than women, and usually presents in the 20s and 30s although it can present later in life.

Sensory features are pain and temperature loss, classically in a shawl-like distribution and dysaesthesia. Light touch, vibration and position sense are affected later. Motor signs start as muscle wasting and weakness that begins in the hands, and progresses to affect the forearms and shoulders. Tendon reflexes are lost and there may be respiratory muscle involvement. Bladder, bowel and sexual dysfunction can develop, as can Horner's syndrome. Extension of the syrinx into the lumbar region can involve the legs.

Lumbar puncture should be avoided due to the risk of herniation. CT and MRI can be used to delineate the extent. Management involves physiotherapy, and neurosurgery to halt progression. Prognosis is variable, but early surgical involvement is beneficial.

In this scenario, the alcohol is a distractor.



[Q: 4252] OnExamination 2012 - Neurology

A 69-year-old male presents with cognitive impairment and a diagnosis of Alzheimer's disease is suspected.

What is the most appropriate test of short term memory?

- 1- Assessing orientation in time
- 2- Assessing serial 7s
- 3- Knowledge of the capital of the UK

- 4- Providing their home address
- 5- Recall of the doctor's name at the end of the consultation

Answer & Comments

Answer: 5- Recall of the doctor's name at the end of the consultation

Short term memory impairment is the commonest clinical presentation of Alzheimer's disease.

Usually patients are fully orientated in time, person and place. Long term memory is usually intact.

The best way to test short term memory is to ask the patient to recall new information in the next few minutes.



[Q: 4253] OnExamination 2012 - Neurology

A 36-year-old male patient with a long history of relapsing-remitting multiple sclerosis, develops double vision.

On examination of his eye movements abduction of either eye elicits nystagmus in that eye. Adduction is impaired in both eyes.

On MRI scanning, where will a new white matter lesion probably be evident?

- 1- Cerebellum
- 2- Cingulate gyrus
- 3- Medial longitudinal bundle
- 4- Optic chiasm
- 5- Parietal lobes

Answer & Comments

Answer: 3- Medial longitudinal bundle

Impairment of adduction in both eyes signifies an internuclear ophthalmoplegia. This is often accompanied by nystagmus of the abducting eye.

The area of the brain affected is the medial longitudinal bundle in the brain stem which connects the third and sixth nerve nuclei.

The main causes of internuclear ophthalmoplegia are

Multiple sclerosis tumour of the brainstem (glioma, for example)

Brainstem vascular lesions or

Wernicke's encephalopathy.



[Q: 4254] OnExamination 2012 - Neurology

A 55-year-old Caucasian man presented to hospital with fever, intermittent rigors, and worsening fatigue. He had returned from a business trip to West Africa six months previously.

What is the most likely diagnosis?

- 1- Brucellosis
- 2- Leishmaniasis
- 3- Plasmodium falciparum malaria
- 4- Plasmodium ovale malaria
- 5- Typhoid fever

Answer & Comments

Answer: 4- Plasmodium ovale malaria

The Duffy blood group on the red blood cells acts as a receptor for P. vivax. West Africans lack the Duffy blood group and therefore P. ovale replaces P. vivax in this region.

Both P. vivax and P. ovale have a liver hypnozoite stage which can cause repeated relapses.

P. falciparum typically presents within the first three months of return.

Visceral leishmaniasis is not endemic in West Africa.

Brucellosis is a zoonosis transmitted through contaminated and untreated milk and by

direct contact with infected animals. The incubation period of brucellosis is usually one to three weeks, but sometimes may be several months. It may have either a sudden or insidious onset and is accompanied by continued, intermittent, or irregular fever.

Typhoid fever presents within one to three weeks from return from an endemic area.



[Q: 4255] OnExamination 2012 - Neurology

A 15-year-old girl presented with a 12 hour history of fever and global headache.

On examination she was febrile (37.5°C). She was fully conscious. Mild neck stiffness was noted but there were no other neurological signs.

Cerebrospinal fluid analysis showed:

Cell count 200/mL (60% lymphocytes)

Protein 0.8 g/L (0.15-0.45)

Glucose 4.3 mmol/L (3.3-4.4)

Gram stain No organisms seen

What is the most likely diagnosis?

- 1- Bacterial meningitis
- 2- Cryptococcal meningitis
- 3- Lymphomatous meningitis
- 4- Tuberculous meningitis
- 5- Viral meningitis

Answer & Comments

Answer: 5- Viral meningitis

Enteroviruses and mumps are the commonest causes of viral meningitis.

Cerebrospinal fluid changes with bacterial meningitis typically include:

High protein

Low glucose and

Neutrophil pleocytosis.

Cryptococcal meningitis is an infection of severely immunocompromised individuals, especially advanced human immunodeficiency virus (HIV) infection.

Tuberculous meningitis is an insidious illness, presenting over weeks and months.



[Q: 4256] OnExamination 2012 - Neurology

A 39-year-old woman is found to have absent ankle jerks and gait disturbance.

Which of the following investigations is not indicated?

- 1- ANA
- 2- B12 levels
- 3- Cholestanol levels
- 4- Ferritin
- 5- VDRL

Answer & Comments

Answer: 4- Ferritin

Absent ankle jerks may occur in conditions associated with neuropathy (B12 deficiency, systemic lupus erythematosus [SLE], cerebrotendinous xanthomatosis) and dorsal root disease (tabes dorsalis).

Gait disturbance may occur for a variety of reasons:

Sensory ataxia in B12 deficiency and tabes dorsalis

Pyramidal signs in B12 deficiency and SLE

Cerebellar ataxia in cerebrotendinous xanthomatosis.

Cerebrotendinous xanthomatosis is an inherited condition, associated with accumulation of cholesterol in tissues including brain, peripheral nerve and tendons which produces a clinical picture of:

Early onset dementia

Gait ataxia

Loss of vibration sense

Cataracts

Large tendon xanthomata.

It is eminently treatable by the oral administration of chenodeoxycholic acid.

To clarify option 3, cholestanol is a derivative of cholesterol. In cerebrotendinous xanthomatosis there is a deficiency in sterol storage, and diagnosis is based on high serum (and tendon) cholestANOL. Serum cholesterol may be normal or low.



[Q: 4257] OnExamination 2012 - Neurology

A 17-year-old female is admitted with an oculogyric crisis.

Which of the following statements concerning this case is correct?

- 1- She is likely to have been prescribed olanzapine
- 2- She should be observed without treatment
- 3- She should be treated with parenteral procyclidine
- 4- She should receive procyclidine as long term prophylaxis
- 5- She is unlikely to have a recurrence

Answer & Comments

Answer: 3- She should be treated with parenteral procyclidine

Oculogyric crisis is an acute dystonic reaction of the face/eyes and is usually a consequence of typical neuroleptic drugs such as haloperidol and chlorpromazine but is unusual with newer agents such as olanzapine and clozapine.

The condition is often precipitated by re-introduction of the agent.

The condition should be treated with procyclidine (usually IV or IM) or benztropine.

Chronic treatment beyond a couple of days is not required.



[Q: 4258] OnExamination 2012 - Neurology

An 18-year-old woman sustains severe head injuries in a road traffic accident.

The following day her investigations show:

Sodium 160 mmol/l (137-144)

Potassium 3.7 mmol/l (3.5-4.9)

Chloride 120 mmol/l (95-107)

Urea 3.0 mmol/l (2.5-7.5)

Creatinine 90 µmol/l (60- 110)

Which one of the following statements is correct?

- 1- Rapid rehydration with 5% dextrose is indicated
- 2- She should be treated with sodium restriction
- 3- She has the syndrome of inappropriate antidiuretic hormone secretion (SIADH)
- 4- She will have a hyperchloraemic acidosis
- 5- Urine osmolality will be low

Answer & Comments

Answer: 5- Urine osmolality will be low

There is a marked hypernatraemia with elevated chloride but normal potassium and urea in a patient with severe head injuries.

The likely cause of this presentation is diabetes insipidus. Urine osmolality is therefore likely to be low.

You cannot say that she has a hyperchloraemic acidosis as you do not have her bicarbonate concentration but if you assume that the anion gap would be normal, that is 10-12, then this would suggest that the

bicarbonate is elevated, suggesting either a metabolic alkalosis or respiratory acidosis with compensation.

Although restoration of normal volaemia and osmolality is required, giving 5% dextrose may exacerbate any cerebral oedema and so correction should be gradual.



[Q: 4259] OnExamination 2012 - Neurology

An 80-year-old male presented with acute right-sided weakness.

Examination revealed minimal right facial weakness, impaired elevation of the right shoulder, with relatively preserved right hand strength. There was global weakness in the right leg which appeared to be maximal in the foot.

Which of the following arteries is most likely to have been affected?

- 1- Anterior cerebral artery
- 2- Lenticulostriate artery
- 3- Middle cerebral artery
- 4- Posterior cerebral artery
- 5- Posterior communicating artery

Answer & Comments

Answer: 1- Anterior cerebral artery

This is a tricky question, and purposely so.

The wording of the description could be due to middle or anterior artery circulation stroke but the challenge is to choose which is the more likely.

The case as described is the classic presentation of an anterior cerebral artery stroke as originally described in the literature. (Critchley M. The anterior cerebral artery and its syndromes. Brain 1930; 53:120-165.)

Unilateral occlusion (distal to ant. comm. origin) of anterior cerebral artery produces contralateral sensorimotor deficits mainly

involving the lower extremity with relative sparing of face and hands (think of the homunculus).

The lateral lenticulostriate artery is a branch of the middle cerebral artery. Occlusion causes damage to the internal capsule resulting in contralateral hemiparesis and sensory deficit. Speech may be affected (medial temporal lobe) as well as visual function (Meyer's loop: optic radiations affected).

Middle cerebral artery: Occlusion at the stem (proximal segment) results in:

Contralateral hemiplegia affecting face, arm, and leg (lesser)

Homonymous hemianopia - ipsilateral head/eye deviation

If on left: global aphasia.

Posterior cerebral artery: A variety of neurological syndromes including:

Pure hemisensory loss

Visual field loss- a variety

Visual agnosia

Disorders of reading (alexia, dyslexia) and more ...



[Q: 4260] OnExamination 2012 - Neurology

A 16-year-old girl presented with a three week history of headache and horizontal diplopia on far right lateral gaze. On two separate occasions she noted dimmed vision whilst bending forwards. Over the last year she had gained 12 kilograms in weight.

On examination, her weight was 95 kg, and height 162 cms.

Neurological examination revealed bilateral papilloedema and a partial right sixth cranial nerve palsy.

What is the most likely diagnosis?

- 1- Benign intracranial hypertension (BIH).
- 2- Multiple sclerosis.
- 3- Pituitary tumour
- 4- Superior sagittal vein thrombosis.
- 5- Thyroid eye disease.

Answer & Comments

Answer: 1- Benign intracranial hypertension (BIH).

This patient is markedly obese with a BMI of 36 and the history suggestive of BIH.

Vision may be affected with enlargement of the blind spot and the visual obscuration with movements that provoke a rise in intracranial pressure (ICP) (for example, bending) is typical of BIH.

Dysthyroid eye disease would not present like this and is more commonly associated with hyperthyroidism.

The papilloedema would argue against multiple sclerosis (MS).

A bitemporal hemianopia or a visual field defect would be expected with a pituitary tumour.

Venous sinus thrombosis is a possibility but would be expected to produce deteriorating symptoms.



[Q: 4261] OnExamination 2012 - Neurology

Which visual field defect is most likely to occur with multiple sclerosis?

- 1- Bitemporal hemianopia
- 2- Central scotoma
- 3- Homonymous hemianopia
- 4- Increased blind spot
- 5- Tunnel vision

Answer & Comments

Answer: 2- Central scotoma

Central scotoma is likely with retrobulbar neuritis and optic atrophy.

Tunnel vision occurs in glaucoma, retinitis pigmentosa and retinal panphotocoagulation.

Increased blind spot occurs with papilloedema, which may lead to optic atrophy.

Optic chiasma compression causes bitemporal hemiopia.



[Q: 4262] OnExamination 2012 - Neurology

Which of the following features are not compatible with the diagnosis of motor neurone disease (MND)?

- 1- Dementia
- 2- Dysphagia
- 3- Muscle cramps
- 4- Neck weakness
- 5- Optic atrophy

Answer & Comments

Answer: 5- Optic atrophy

Ten per cent of patients with MND have dementia (frontotemporal).

Optic atrophy is not a feature of MND.

Other features not compatible with the diagnosis are sensory impairment and bladder dysfunction.



[Q: 4263] OnExamination 2012 - Neurology

A 25-year-old old woman presents with two hours of a unilateral temporal headache increasing in severity. The pain is of a throbbing character and is exacerbated by light.

There are no abnormal signs on examination.

What is the diagnosis?

- 1- Acute subarachnoid haemorrhage.
- 2- Cluster headache.
- 3- Intracranial tumour.
- 4- Migraine.
- 5- Tension headaches.

Answer & Comments

Answer: 4- Migraine.

Migraine is the commonest cause of headache in young patients.

Photophobia, unilateral presentation and normal examination will be consistent with migraine.



[Q: 4264] OnExamination 2012 - Neurology

A 62-year-old man presented with difficulty in walking. He had a past history of diabetes mellitus and cervical spondylosis, which had required surgical decompression eight years previously. He drank 40 units of alcohol weekly.

On examination there was fasciculation, wasting and weakness in the left deltoid and biceps, with weakness in the shoulder girdle muscles bilaterally.

There was fasciculation in the glutei and quadriceps bilaterally, weakness of hip flexion and foot dorsiflexion, brisk reflexes in upper and lower limbs, and extensor plantar responses. There was no sensory impairment.

What is the diagnosis?

- 1- Alcoholic myopathy
- 2- Diabetic amyotrophy
- 3- Motor neurone disease
- 4- Recurrent cervical cord compression
- 5- Syringomyelia

Answer & Comments

Answer: 3- Motor neurone disease

There are signs of lower (wasting, fasciculations) and upper (brisk reflexes, extensor plantar response) motor neuron involvement in the presence of normal sensation.

Motor neuron disease is the most common cause of such presentation.

Alcoholic myopathy and diabetic amyotrophy do not share upper motor neuron signs.

Syringomyelia presents with sensory symptoms and signs (spinothalamic).

You expect sensory involvement with cervical cord compression.



[Q: 4265] OnExamination 2012 - Neurology

A female patient aged 30 has a five year history of difficulty getting upstairs and out of a low chair and mild upper limb weakness but no pain. There is no family history.

She presented with severe type 2 respiratory failure. EMG showed evidence of myopathy.

Which is the most likely diagnosis?

- 1- Acid maltase deficiency
- 2- Inclusion body myositis
- 3- Lambert-Eaton myasthenic syndrome
- 4- Miller-Fisher syndrome
- 5- Polymyositis

Answer & Comments

Answer: 1- Acid maltase deficiency

Acid maltase deficiency typically presents with insidious onset of proximal myopathy and early respiratory muscle weakness.

Respiratory failure in inflammatory myopathies (polymyositis, dermatomyositis, inclusion body myositis) and limb girdle

muscular dystrophy are rare. Muscle biopsy shows vacuolation in muscle fibres.

Miller-Fisher syndrome, a variant of Guillain-Barré syndrome, is characterised by ophthalmoplegia, ataxia and areflexia.

Lambert-Eaton myasthenic syndrome, often a paraneoplastic phenomenon, is associated with hyporeflexia which returns after exercise, autonomic symptoms and fatigability.



[Q: 4266] OnExamination 2012 - Neurology

A broad-based ataxic gait occurs characteristically with which of the following?

- 1- Basal ganglia lesion
- 2- Cerebellar vermis lesion
- 3- Phenytoin toxicity
- 4- Proximal myopathy
- 5- Right-sided cerebral infarction

Answer & Comments

Answer: 3- Phenytoin toxicity

Broad based gait is associated with cerebellar syndrome. However, lesions of cerebellar vermis cause truncal ataxia and tendency to fall backwards.

Basal ganglia disease causes extrapyramidal signs with parkinsonism (festinant gait, marche à petits pas).

Proximal myopathy causes a waddling gait.

Right-sided cerebral infarction is associated with a hemiplegic gait.



[Q: 4267] OnExamination 2012 - Neurology

Causes of a small pupil include which of the following?

- 1- Carbon monoxide poisoning

2- Ethylene glycol poisoning

3- Holmes-Adie pupil

4- Pontine haemorrhage

5- Third nerve palsy

Answer & Comments

Answer: 4- Pontine haemorrhage

Causes of small pupils include:

Horner's syndrome

Old age

Pontine haemorrhage

Argyll Robertson pupil

Drugs and poisons (opiates, organophosphates).

Causes of dilated pupils include:

Holmes-Adie (myotonic) pupil

Third nerve palsy

Drugs and poisons (atropine, cobalt [CO], ethylene glycol).



[Q: 4268] OnExamination 2012 - Neurology

A previously well 27-year-old woman presents with a history of transient ischaemic attack affecting her right side and speech.

She had returned to the United Kingdom from a holiday in New Zealand two days previously.

On examination there was nothing abnormal to find. An ECG, chest x ray, CT brain scan and routine haematology and biochemistry were all normal.

What is the most likely underlying abnormality?

- 1- Atrial myxoma
- 2- Carotid artery stenosis
- 3- Embolus from paroxysmal atrial fibrillation
- 4- Patent foramen ovale

5- Subarachnoid haemorrhage

Answer & Comments

Answer: 4- Patent foramen ovale

This is a typical cause of stroke in a young person due to prolonged immobility.

Deep vein thrombosis with patent foramen ovale will cause paradoxical embolism and stroke.



[Q: 4269] OnExamination 2012 - Neurology

A 72-year-old male presented with a quadrantic hemianopia.

Which of the following conditions is most likely to cause such a presentation?

- 1- A lesion of the occipital cortex
- 2- A lesion of the optic chiasma
- 3- Bilateral diabetic retinopathy
- 4- Chloroquine poisoning
- 5- Tobacco amblyopia

Answer & Comments

Answer: 1- A lesion of the occipital cortex

Unilateral occipital lobe lesions (left or right) cause contralateral hemianopsia or quadrantanopsia, visual agnosia, visual illusions and elementary visual hallucinations.

Left occipital lobe lesions cause these symptoms and alexia and colour agnosia.

Right occipital lobe lesions cause impaired visual orientation and topographical memory in addition.

Bioccipital lesions are rare, but cause cortical blindness, altitudinal hemianopsia, impaired colour perception, Anton syndrome and prosopagnosia.

A lesion of the optic chiasm would cause a bitemporal hemianopia.

Diabetic retinopathy can rarely cause an 'apparent quadrantic hemianopia' because the distribution of the retinal changes may just correspond to quadrantic hemianopia - but this is not the most likely.

Tobacco amblyopia causes symmetric central or centrocaecal scotomas.

Chloroquine poisoning causes symmetric bilateral scotomas.



[Q: 4270] OnExamination 2012 - Neurology

Which of the following is a form of generalised seizure?

- 1- Automatisms
- 2- Aversive seizures
- 3- Benign rolandic epilepsy
- 4- Epilepsia partialis continua
- 5- Lennox-Gastaut syndrome

Answer & Comments

Answer: 5- Lennox-Gastaut syndrome

Seizures may be classified as:

A. Partial

Simple partial (consciousness retained), motor, sensory, autonomic, psychic

Complex partial (consciousness impaired)

Simple partial followed by impaired consciousness, or consciousness impaired at onset

Partial seizures with secondary generalisation

B. Generalised seizures

Absences (typical or atypical)

Generalised tonic clonic

Tonic

Clonic

Myoclonic

Atonic

Infantile spasms

C. Unclassified averse seizures are a form of simple partial seizure, consisting of head turning and conjugate eye movements.

Rasmussen's encephalitis is a subacute inflammatory encephalitis, and is one cause of epilepsia partialis continua.

Complex partial seizures often contain automatisms which may be elementary (including lip smacking, chewing, swallowing or salivation), or automatic behaviour (semi-purposive unco-ordinated or unplanned gestures including picking and pulling at clothing).

Rolandic epilepsy is a benign partial epilepsy associated with centro-temporal spikes. There is an excellent prognosis.



[Q: 4271] OnExamination 2012 - Neurology

Which of the following forms of encephalitis is caused by a neuroimmunological response?

- 1- Cytomegalovirus
- 2- Enteroviruses
- 3- Herpes simplex
- 4- HIV infection
- 5- Measles

Answer & Comments

Answer: 5- Measles

Encephalitis may be caused by:

Direct invasion by a neurotoxic virus (encephalitis)

Post-infectious encephalopathy: delayed brain swelling because of an immunological response to the antigen

Slow virus infection, for example, human immunodeficiency virus [HIV] or subacute sclerosing panencephalitis [SSPE].

Direct infection is most commonly caused by enteroviruses, herpes simplex virus (HSV) 1 and 2, varicella, cytomegalovirus (CMV), and Epstein-Barr virus (EBV).

It is also occasionally caused by respiratory viruses, human herpes virus 6 (HHV6), rubella or mumps.

A post-infectious illness may also be caused by measles or varicella zoster (cerebellar ataxia).



[Q: 4272] OnExamination 2012 - Neurology

In considering the management of convulsions select the correct statement from the list below.

- 1- Hypoglycaemia should always be considered.
- 2- If the fit lasts longer than five minutes, then PR diazepam should be given.
- 3- Paraldehyde is best given intramuscularly.
- 4- Phenobarbitone is a useful therapy in school age children.
- 5- When associated with fever, antibiotics should always be given to cover the possibility of meningitis.

Answer & Comments

Answer: 1- Hypoglycaemia should always be considered.

Status epilepticus is traditionally defined as continuous convulsion lasting longer than 30 minutes, or the occurrence of serial convulsions between which there is no return of consciousness.

It may be generalised (tonic clonic, absent) or partial (simple, complex, or with secondary

generalisation). Generalised tonic clonic seizures predominate.

There are three major sub-types:

Prolonged febrile seizures.

Idiopathic status epilepticus (no underlying central nervous system [CNS] lesion or insult).

Symptomatic (longstanding neurological disorder or metabolic abnormality).

The most common cause in a child less than 3 years is a prolonged febrile seizure. Sleep deprivation and drug withdrawal can also precipitate it.

The relationship between neurological outcome and duration of status epilepticus is unknown in children and adults. In the animal model, 60 minutes of constant seizure activity is associated with pathological changes, even when metabolic homeostasis is maintained.

Cell death thus results in increased metabolic demands from continually discharging neurones. Vulnerable areas include the hippocampus, the mid to low cerebellum, middle cortical areas, and thalamus.

Approximately 20 minutes of status epilepticus produces regional oxygen sufficiency deficiency promoting cell damage and necrosis. This is, therefore, used as the threshold in children.

Initial management begins with ABC.

Remember DEFG (Don't Ever Forget Glucose): Hypoglycaemia should be excluded as it is easily and rapidly treatable (if present 3-5 ml/kg of 10% dextrose is given by IV infusion), and blood obtained for full blood count, electrolytes including calcium and magnesium, glucose, creatinine, anticonvulsant levels. Blood and urine may be obtained for toxicology. Arterial blood gases should be done, and consideration given to lumbar puncture.

First line anticonvulsant therapy would be lorazepam/diazepam given IV if possible. If seizures persist then phenytoin may be given as a loading dose followed by an infusion.

Phenobarbitone may be used as first line in infants. Paraldehyde can be given as a dilute solution intravenously, or administered rectally or IM. The latter two routes can produce tissue damage and sloughing, so these should be reserved for exceptional circumstances.



[Q: 4273] OnExamination 2012 - Neurology

Which is true of herpes simplex encephalitis?

- 1- Brain MRI is characteristically normal
- 2- Fits are uncommon
- 3- Genital herpes is usually present
- 4- Temporal lobe involvement is common
- 5- Viral identification using polymerase chain reaction (PCR) on CSF is non-specific

Answer & Comments

Answer: 4- Temporal lobe involvement is common

Herpes simplex encephalitis (HSE) is associated with high signal in one or both temporal lobes (limbic encephalitis).

Seizures are commonly present in HSE.

Herpes simplex virus type 1 is the causative virus (not type 2 which is associated with genital herpes).

PCR for herpes simplex virus on cerebral spinal fluid (CSF) is a highly specific test.



[Q: 4274] OnExamination 2012 - Neurology

A 62-year-old male is noted to have a broad-based ataxic gait.

This is characteristic of which of the following?

- 1- A basal ganglia lesion
- 2- Cerebellar vermis lesion
- 3- Osteomalacia
- 4- Phenytoin toxicity
- 5- Right-sided cerebral infarction

Answer & Comments

Answer: 4- Phenytoin toxicity

Broad-based gait is associated with cerebellar syndrome.

However, lesions of cerebellar vermis cause truncal ataxia and tendency to fall backwards.

Right-sided cerebral infarction is associated with a hemiplegic gait.

Basal ganglia disease causes extrapyramidal signs with parkinsonism (festinant gait, marche à petit pas).

Proximal myopathy causes a waddling gait.



[Q: 4275] OnExamination 2012 - Neurology

A 60-year-old male with a history of diabetes, hypertension and hypercholesterolaemia presents with dizziness.

He reports that he woke up this morning and attempted to get out of bed but felt dizzy. He vomited and was unable to get out of bed to go to the bathroom. His wife was concerned as this had never happened before and called for the ambulance.

On arrival at the emergency room his blood pressure was 180/70 mmHg, pulse was regular at 60 beats per minute and he was afebrile. Blood sugar was within normal limits.

On neurological examination his visual fields were full, and fundoscopy was notable for grade 2 hypertensive retinopathy. He had left

jerk nystagmus on looking to the left and left jerk nystagmus on looking to the right. He was able to perform finger to nose and heel to shin in the bed.

On standing the patient felt dizzy. His blood pressure was 170/80 mmHg after three minutes standing. He refused to walk for fear of falling. The rest of his examination was unremarkable.

What is the leading diagnosis at this time?

- 1- Benign paroxysmal positional vertigo
- 2- Cerebrovascular accident
- 3- Hypertensive emergency
- 4- Labyrinthitis
- 5- Orthostatic hypotension

Answer & Comments

Answer: 1- Benign paroxysmal positional vertigo

Although there is no dysmetria a patient can have vertigo in isolation from a stroke.

Typically however the patient has direction changing nystagmus. You would be more reassured if the patient were able to walk. A trial of meclizine prior to walking may help.

A cerebrovascular accident should be considered and an MRI obtained of the brain.

The patient is not orthostatic on examination by definition.

Labyrinthitis typically has associated tinnitus and a history of infection or head trauma.



[Q: 4276] OnExamination 2012 - Neurology

A 27-year-old man presents with three months of difficulty walking.

Examination reveals motor weakness of left leg in a pyramidal distribution with increase in tone. There is impaired pinprick sensation of right leg extending into the groin.

What is the cause of these signs?

- 1- A central cauda equina lesion.
- 2- A cervical spinal cord lesion.
- 3- A foramen magnum lesion.
- 4- A left sided thoracic spinal cord lesion.
- 5- Bilateral cerebral hemisphere lesions.

Answer & Comments

Answer: 4- A left sided thoracic spinal cord lesion.

The history suggests Brown-Sequard syndrome produced by a hemisection of the spinal cord.

The clinical presentation is that of ipsilateral weakness and a loss of position and vibration below the lesion with contralateral loss of pain and temperature.



[Q: 4277] OnExamination 2012 - Neurology

A 75-year-old man is brought to see you by his wife. She is no longer able to manage his urinary incontinence.

He was diagnosed with Parkinson's disease by his GP a few years ago when he became slow and shuffling and used to struggle to get to the toilet in time. She says he 'lost a lot of the warning' from his bladder and would sometimes be incontinent. However, his wife says he now no longer seems to care whether he is being incontinent of urine or not. She admits that he has been 'forgetful' for a few years but that this is also getting much worse.

What is the most likely diagnosis?

- 1- Alzheimer's dementia
- 2- Lewy body dementia
- 3- Normal pressure hydrocephalus
- 4- Obstructive uropathy
- 5- Parkinson's plus syndrome

Answer & Comments

Answer: 3- Normal pressure hydrocephalus

Normal pressure hydrocephalus causes the triad of dementia, gait abnormality and urinary incontinence.

It is a cause of reversible dementia as symptoms may resolve with a shunt, so is an important diagnosis not to miss.

The gait can often be confused with that of a Parkinson's patient.

Urinary problems often begin as urgency and frequency and may progress to frontal lobe incontinence (patients are indifferent to their incontinence).

Sometimes diagnosing conditions, particularly dementias, may be difficult in the early stages. Always be ready to consider reviewing a previous diagnosis (such as this patient's previous diagnosis of Parkinson's disease) in light of new symptoms.

A. Alzheimer's dementia is not the answer. This initially causes forgetfulness, patients then undergo progressive cognitive decline with disintegration of personality. Urinary incontinence and gait disturbance are not typical features.

B. Lewy body dementia is not the answer. Patients with this problem typically complain of visual hallucinations and fluctuating cognition. They usually have a degree of parkinsonism, but urinary incontinence is not typically prominent.

C. Normal pressure hydrocephalus is the correct answer (see above).

D. Obstructive uropathy is not the correct answer. This may cause overflow incontinence of the bladder and confusion, particularly in patients with already impaired cognition. However, it would not explain the patient's indifference to his incontinence.

E. Parkinson's plus syndrome is not the correct answer. This is a group of neurodegenerative disorders with classical parkinsonian signs and some additional features. However, this history does not fit well with any of these conditions.



[Q: 4278] OnExamination 2012 - Neurology

A 25-year-old woman presents with new double vision.

On examination she experiences horizontal diplopia on looking to her far right. Covering her left eye only obscures the innermost image. Covering her right eye only obscures the outermost image. In the neutral position her right eye is deviated medially. She has no problem on looking to the far left.

Her neurological examination is otherwise normal.

What is the most likely problem?

- 1- Concomitant right esotropia
- 2- Left sided IVth nerve palsy
- 3- Left sided VIth nerve palsy
- 4- Medial longitudinal fasciculus lesion
- 5- Right sided VIth nerve palsy

Answer & Comments

Answer: 5- Right sided VIth nerve palsy

The VIth nerve is motor to the lateral rectus muscle.

It is responsible for abduction of the ipsilateral eye.

In the neutral position the affected eye is deviated medially due to unopposed action of the medial rectus.

In patients with diplopia the 'cover test' can be used to determine the eye that has the problem. On covering the affected eye the outermost image disappears.

After finding a VIth nerve palsy the cause should always be looked for, it is not a diagnosis in itself.

Due to the long course and anatomy of the VIth nerve it can be damaged in any condition causing raised intracranial pressure. It can therefore be a 'false localising sign'.

Regarding the options:

Concomitant right esotropia is not the answer. An esotropia is a squint where one or both eyes turn inwards. This may alternate between the eyes or may be a problem in just one eye. A concomitant esotropia is a squint where the degree by which the eye turns inwards does not vary in any direction of gaze (as opposed to an incomitant esotropia where the direction of gaze does affect the size or presence of deviation). Concomitant esotropias usually begin early in childhood. The patient has diplopia in all directions of gaze if vision is normal in both eyes.

Left sided IVth nerve palsy is not the answer. The IVth nerve controls the superior oblique muscle. Lesions of it typically cause a vertical diplopia, usually noticed on going downstairs or reading.

Left sided VIth nerve palsy is not the answer. This would cause a horizontal diplopia but it would be on far left gaze. The outermost image would disappear with the cover test over the left eye if it was affected.

A medial longitudinal fasciculus lesion is not the answer. This connects the IIIrd and VIth cranial nerve nuclei in the pons and coordinates conjugate horizontal eye movements. Its lesions typically cause internuclear ophthalmoplegia. There will be impaired adduction on the side of the lesion with nystagmus of the contralateral eye. In the neutral position the eyes appear normal.

Right VIth nerve palsy is the correct answer (see above).



[Q: 4279] OnExamination 2012 -
Neurology

What is the most common finding in Cheyne-Stokes breathing?

- 1- Heart failure
- 2- Liver failure
- 3- Pilocytic astrocytoma
- 4- Renal failure
- 5- Stroke

Answer & Comments

Answer: 1- Heart failure

Stroke and metabolic dysfunction can also result in Cheyne-Stokes apnoea but are not as common as heart failure.

Cheyne-Stokes is a type of central sleep apnoea in which there is loss of chest and abdominal movements and crescendo-decrescendo breathing in a repetitive fashion.

Treatments include diuretics and non-invasive ventilation.



[Q: 4280] OnExamination 2012 -
Neurology

A 70-year-old man presents with difficulty speaking.

He has a history of diabetes, hypertension, hypercholesterolaemia, chronic obstructive pulmonary disease. He is currently on aspirin, simvastatin, amlodipine and hydrochlorothiazide. On examination the patient is awake, his blood pressure is 150/70 mmHg. His pulse is irregularly irregular.

He has 4/5 strength in the right arm and leg and 5/5 strength on the left. When asked to point to the window he does this correctly. When told to raise his arms and place his hands out he is seen to have a pronator drift on the right. He is shown a pen and asked what it is. He responds fluently but makes some paraphasic errors. He is asked to use it

appropriately and begins to write on a piece of paper. When asked to repeat 'Today is a sunny day', he is unable to do so.

Which of the following terms best describes these signs?

- 1- Anomic aphasia
- 2- Broca's aphasia
- 3- Conduction aphasia
- 4- Transcortical motor aphasia
- 5- Transcortical sensory aphasia

Answer & Comments

Answer: 3- Conduction aphasia

In Broca's or non-fluent or expressive aphasia the patient is unable to name objects with poor comprehension and repetition. It localises to the Broca's area in the left posterior inferior frontal gyrus.

In transcortical motor aphasia, which localises to the anterior superior frontal lobe, the patient has good comprehension and repetition but has halting, effortful speech. Patients also have impaired writing skills.

Transcortical sensory aphasia is characterised by impaired auditory comprehension with intact repetition and fluent speech, and is caused by damage to the temporal lobes. It differs from Wernicke's aphasia in that patients still have intact repetition, and exhibit echolalia (the compulsive repetition of words). Improvement may be seen with speech therapy.

Anomic aphasia (also known as nominal aphasia) results in word finding difficulties. On closer examination there may also be repetition problems and comprehension problems but these are typically mild compared to other aphasia syndromes.

This scenario describes conduction aphasia. It is characterised by frequent speech errors, impaired repetition, reduced phonological short-term memory and naming difficulties.

In contrast to other forms of dysphasia, speech output is otherwise fluent and grammatically correct. Comprehension is intact. It is thought to be caused by left temporo-parietal region damage.



[Q: 4281] OnExamination 2012 - Neurology

A 72-year-old man with a history of type 2 diabetes mellitus and multiple transient ischaemic attacks (TIAs) comes to the hospital complaining of visual field loss. He says this happened suddenly and he woke up with problems with his vision the morning before coming to the Emergency department.

Medication includes clopidogrel, ramipril, atorvastatin, and metformin.

On examination his BP is 165/100 mmHg, his pulse is 76 and regular. Visual field examination reveals a right homonymous upper quadrantanopia.

Where is the most likely site for the underlying lesion?

- 1- Left occipital lobe
- 2- Left temporal lobe
- 3- Optic chiasm
- 4- Right optic nerve
- 5- Right temporal lobe

Answer & Comments

Answer: 2- Left temporal lobe

Temporal lobe lesions result in a bilateral homonymous hemianopia.

Occipital lobe lesions result in cortical blindness.

The most likely cause in this case is a thromboembolic event affecting the left temporal lobe. Given he has suffered multiple TIAs he should be considered for a work up including echocardiogram and carotid USS.

Anti-platelet management if tolerated should be with aspirin and dipyridamole as per the ESPS2 trial.



[Q: 4282] OnExamination 2012 - Neurology

A 50-year-old gentleman presents to the emergency department having had a fall.

Examination revealed ataxia and some mild extrapyramidal signs. He was receiving treatment for suspected Parkinson's disease following a fall he had had six months ago when he demonstrated extrapyramidal signs. His symptoms had been noted to have improved with the medication. Tilt table testing was performed and found to be positive.

What is the likely diagnosis?

- 1- Cerebellar degeneration
- 2- Multi-system atrophy
- 3- Parkinson's disease
- 4- Postural hypotension
- 5- Wilson's disease

Answer & Comments

Answer: 2- Multi-system atrophy

Multi-system atrophy includes three syndromes that usually overlap

Striatal degeneration leading to parkinsonism

Autonomic failure

Olivopontocerebellar degeneration.

The average age of onset is 50 years (earlier than in Parkinson's disease) and the median survival six to nine years. It runs a briefer course than Parkinson's disease.

The clinical presentation is highly varied and may begin with any of the above clinical signs. The unifying pathologic hallmark is the

presence of a-synuclein-positive inclusions located in various brain regions.

Early in the course of the illness parkinsonian features may respond to dopaminomimetic agents. These have to be used with caution due to their tendency to provoke orthostatic hypotension.



[Q: 4283] OnExamination 2012 - Neurology

A 23-year-old male is admitted following an altercation in which he is stabbed in the thigh by a bottle.

Which of the following features suggests injury to the femoral nerve?

- 1- Loss of knee reflex
- 2- Loss of sensation over lateral aspect of thigh
- 3- Weakness of abduction of the hip
- 4- Weakness of adduction at the hip
- 5- Weakness of knee flexion

Answer & Comments

Answer: 1- Loss of knee reflex

A lesion of the femoral nerve (L2/3/4) is characterised by weakness of the quadriceps femoris muscle and hence weakness of extension of the knee, loss of sensation over the front of the thigh and loss of the knee jerk.

The obturator nerve (L2-4) supplies adductors of hip and lateral cutaneous nerve to thigh supplies sensation to the outer part of the thigh.



[Q: 4284] OnExamination 2012 - Neurology

A 18-year-old man is referred with a six month history of daily headache which is mostly frontal in location and occasionally associated with nausea. He has been taking

paracetamol 3 g/day, aspirin 300 mg thrice daily and codeine 40 mg thrice daily, which has only a temporary effect.

He has a two year history of depression, treated with paroxetine. No abnormalities were found on examination.

What is the most likely diagnosis?

- 1- Analgesic misuse headache
- 2- Cerebral tumor
- 3- Cluster headache
- 4- Headache due to depression
- 5- Migraine

Answer & Comments

Answer: 1- Analgesic misuse headache

The two commonest causes of chronic daily headache are tension type headache and analgesic misuse headache.

The latter is the most likely diagnosis for this patient's symptoms.

It usually occurs as a result of chronic use of analgesics such as codeine phosphate and paracetamol.

Typically the headache is relieved with the analgesics just to return in the next hours.

The treatment of choice is the slow reduction and withdrawal of analgesics.



[Q: 4285] OnExamination 2012 - Neurology

A 60-year-old man presents with an episode of memory loss. Three days earlier he had become confused. His wife led him into the house - he apparently sat down at her request, and had a cup of tea. He then wandered around the house, confused, but remained conscious and able to have some conversation with his wife, though continuing to ask similar questions repeatedly.

After three hours, he abruptly returned to normal and had no recollection of the events.

What is the most likely diagnosis?

- 1- Alcohol related amnesia
- 2- Chronic subdural haematoma
- 3- Complex partial status epilepticus
- 4- Hysterical fugue state
- 5- Transient global amnesia

Answer & Comments

Answer: 5- Transient global amnesia

This is the typical clinical description of transient global amnesia which represents a transient vascular insufficiency of both hippocampi.



[Q: 4286] OnExamination 2012 - Neurology

A 70-year-old man presents with difficulty speaking.

He has a history of diabetes, hypertension, hypercholesterolaemia, chronic obstructive pulmonary disease. He is currently on aspirin, simvastatin, amlodipine and hydrochlorothiazide.

On examination the patient is awake, his blood pressure is 150/70 mmHg. His pulse is irregularly irregular. He has 4/5 strength on the right arm and leg and 5/5 strength on the left.

When asked to point to the window he appears unable to do so. When told to raise his arms and place his hands out he does not. When visually shown the same action he is able to perform it. When asked to repeat 'Today is a sunny day', he is able to do so.

With what is this type of dysphasia consistent?

- 1- Broca's aphasia
- 2- Global aphasia
- 3- Transcortical motor aphasia

- 4- Transcortical sensory aphasia
- 5- Wernicke's aphasia

Answer & Comments

Answer: 4- Transcortical sensory aphasia

In Broca's or non-fluent or expressive aphasia the patient is unable to name objects with poor comprehension and repetition. It localises to the Broca's area in the left posterior inferior frontal gyrus.

In Wernicke's or fluent or receptive aphasia the patient is able to form correct grammatical sentences but language content is incorrect. It localises to the dominant superior temporal gyrus. There is poor comprehension and repetition but verbal output is fluent.

In transcortical motor aphasia, which localises to the anterior superior frontal lobe, the patient has good comprehension and repetition but has halting, effortful speech. Patients also have impaired writing skills.

Global aphasia results in an almost mute patient: there is poor verbal output, comprehension, repetition and understanding.

Transcortical sensory aphasia is what is described in this case. It is characterised by impaired auditory comprehension with intact repetition and fluent speech, and is caused by damage to the temporal lobes. It differs from Wernicke's aphasia in that patients still have intact repetition, and exhibit echolalia (the compulsive repetition of words). Improvement may be seen with speech therapy.



[Q: 4287] OnExamination 2012 - Neurology

A 65-year-old woman has a one month history of malaise, weight loss, right sided pain around the eye and headaches. She has also noticed intermittent diplopia.

Five years previously she had a mastectomy for carcinoma of the breast.

On examination, temperature was 37.5°C, there was tenderness of the scalp on the right forehead and temple, and some minor weakness of abduction of the right eye. ESR 55 mm/hour.

What is the most likely diagnosis?

- 1- Frontal sinusitis
- 2- Giant cell arteritis
- 3- Meningeal metastatic disease
- 4- Posterior communicating artery aneurysm
- 5- Thyroid eye disease

Answer & Comments

Answer: 2- Giant cell arteritis

The clinical description is classic for giant cell arteritis.

It should always be considered in elderly patients with headaches, ocular symptoms, systemic symptoms and high erythrocyte sedimentation rate.



[Q: 4288] OnExamination 2012 - Neurology

A 79-year-old woman has had worsening shortness of breath for several years.

She now has to sleep sitting up on two pillows. She has difficulty swallowing. There is no history of chest pain. She is afebrile.

Recently, she suffered a stroke with left hemiparesis. A chest x ray reveals a near-normal left ventricular size with a prominent left atrial border.

Which of the following conditions is most likely to account for these findings?

- 1- Aortic coarctation
- 2- Cardiomyopathy
- 3- Essential hypertension
- 4- Left renal artery stenosis

- 5- Mitral valve stenosis

Answer & Comments

Answer: 5- Mitral valve stenosis

Mitral valve stenosis leads to left atrial enlargement, but the left ventricle is usually small.

An enlarged left atrium may lead to pressure posteriorly on the oesophagus.

Most mitral valvular disease in adults results from rheumatic heart disease.



[Q: 4289] OnExamination 2012 - Neurology

A 60-year-old man was brought to casualty after a fall in his bathroom.

Seen immediately by his family, he was already picking himself up from the floor and said he was not injured. His wife felt that he was transiently dazed.

On examination, he was alert, and no abnormalities were noted. His medical history included a history of hypertension for which he was taking bendroflumethiazide 2.5 mg daily. He was discharged without any further intervention.

Two weeks later his wife brings the patient to see you because the dazed state has returned. Examination reveals a temperature of 36.7°C, a pulse rate of 84 bpm regular, a blood pressure of 152/94 mm Hg. On questioning he is slightly slowed, being disoriented to time with some deficit in recent memory. The patient moves slowly, but power is normal. Neurologic examination shows slight hyperactivity of the tendon reflexes on the right with unclear plantar responses because of bilateral withdrawal.

Which of the following would you request?

- 1- 24-hour ambulatory electrocardiogram
- 2- CSF analysis
- 3- CT of the head

- 4- EEG
- 5- Electromyography and nerve conduction testing

Answer & Comments

Answer: 3- CT of the head

This patient probably has evidence of a right sided hemiparesis and together with the history of confusion and previous head injury a diagnosis of subdural haematoma should be suspected.

Consequently the most appropriate investigation would be CT headscan.

Particularly in the presence of focal neurology, a CT scan should be performed before embarking upon a lumbar puncture.



[Q: 4290] OnExamination 2012 - Neurology

Which of the following statements regarding hiccup is true?

- 1- Is caused by a tonic relaxation of the diaphragm.
- 2- Is commonly caused by local irritation to the vagus nerve.
- 3- Can reliably be treated with theophylline.
- 4- May be caused by a foreign body in the nose.
- 5- May be caused by a posterior fossa tumour.

Answer & Comments

Answer: 5- May be caused by a posterior fossa tumour.

Hiccup is caused by frequent or rhythmic clonic contraction of the diaphragm. When prolonged, other causes should be considered including:

CNS disease: Posterior fossa tumour, brain injury, encephalitis

Phrenic nerve or diaphragm irritation: Tumour, pleurisy, pneumonia, intrathoracic adenopathy, pericarditis, gastro-oesophageal reflux, oesophagitis

Systemic causes: Alcohol intoxication, uraemia

Other: Foreign body or insect in the ear.

In infants it may be associated with apnoea or hyperventilation.

Folk remedies include aerophagia, breath holding, pharyngeal stimulation, distraction.

Haloperidol, metaclopramide and several anaesthetic agents are also said to work.



[Q: 4291] OnExamination 2012 - Neurology

A 60-year-old woman presents with a 24 hours history of headache and vomiting. She has been on steroids for temporal arteritis for the last three years.

Examination demonstrates pyrexia, neck stiffness, photophobia, dysarthria, nystagmus and ataxia. CSF shows neutrophilic pleocytosis, low glucose, elevated protein.

What is the most likely diagnosis?

- 1- Carcinomatosis meningitis
- 2- Cryptococcal meningitis
- 3- Listeria meningitis
- 4- Meningococcal meningitis
- 5- Tuberculous meningitis

Answer & Comments

Answer: 3- Listeria meningitis

Risk factors for listeria meningitis include older age and immunosuppression.

It is typically associated with brain stem signs.

Cerebrospinal fluid shows

Neutrophilic pleocytosis

Low glucose and

High protein.



[Q: 4292] OnExamination 2012 -
Neurology

A 63-year-old male is admitted with acute onset unsteadiness of gait, dizziness and dysphagia.

Examination revealed a right-sided Horner's syndrome, nystagmus, loss of pain and temperature sensation on the left side of the trunk and in the left arm and leg, and gait ataxia.

What is the most likely diagnosis?

- 1- Leaking posterior communicating artery aneurysm
- 2- Left sided acoustic neuroma
- 3- Posterior inferior cerebellar artery occlusion
- 4- Right sided pontine infarct
- 5- Spontaneous left sided cerebellar haemorrhage

Answer & Comments

Answer: 3- Posterior inferior cerebellar artery occlusion

This is Wallenberg's syndrome/lateral medullary syndrome and is due to occlusion of the posterior inferior cerebellar artery.



[Q: 4293] OnExamination 2012 -
Neurology

A 52-year-old man has a slurring of his speech.

Examination reveals bilateral partial ptosis and frontal balding, and difficulty releasing his grip after shaking hands.

What is the most likely diagnosis?

- 1- Duchenne muscular dystrophy
- 2- Eaton-Lambert syndrome

3- Myasthenia gravis

4- Myotonia dystrophica

5- Myotonia congenita

Answer & Comments

Answer: 4- Myotonia dystrophica

Myotonia dystrophica is autosomal dominant.

Its features include:

Ptosis

Frontal balding

Cataracts

Cardiomyopathy

Impaired intellect

Testicular atrophy

Diabetes mellitus and

Slurred speech (from tongue and pharyngeal myotonia).

There is no treatment for weakness which is the main cause of disability, but phenytoin, quinine or procainamide may be useful for myotonia.

Myotonia congenital (Thomsen's disease) is not associated with features of myotonia dystrophica apart from difficulty relaxing after forceful contraction.



[Q: 4294] OnExamination 2012 -
Neurology

A 27-year-old man presents with a two year history of intermittent tingling sensation involving his left side.

It starts in his fingers and spreads in 10-20 seconds to affect the whole arm and leg on the same side. The attacks only last for one minute.

Which of the following is the most likely diagnosis?

- 1- Hyperventilation
- 2- Migraine with aura
- 3- Multiple sclerosis
- 4- Somatosensory seizures
- 5- Transient ischaemic attacks

Answer & Comments

Answer: 4- Somatosensory seizures

Positive symptoms (jerking, tingling) usually signify epilepsy.

Negative symptoms (weakness, numbness) are usually caused by transient focal ischaemia.

Spread of symptoms ('marching') indicates migraine (in 5-20 minutes) or seizures (in seconds).

The usual source of somatosensory seizures is the parietal lobe.



[Q: 4295] OnExamination 2012 - Neurology

A 19-year-old woman presents to the clinic having had five blackouts over the last year, all while she is standing up.

She gets warnings of blurred vision, nausea, and feeling hot. She has been witnessed twice to have jerking of all limbs while she is unconscious. The attacks last 30 to 60 seconds.

She recovers quickly after the attacks. She has never bitten her tongue or sustained any injuries.

Physical examination and an ECG are normal. Her grandmother and sister suffer from epilepsy.

Which of the following investigations is the most appropriate?

- 1- 24 hour ECG recording
- 2- CT brain
- 3- ECHO

- 4- EEG
- 5- Tilt table test

Answer & Comments

Answer: 5- Tilt table test

The most likely diagnosis is vasovagal syncope.

The gradual onset of the attack is typical. It is common for patients with syncope to have jerking of their limbs while they are unconscious.

Warning symptoms of darkening/blurring of vision, dizziness and feeling hot are characteristic in syncope. Patients usually recover very quickly after the event.

Tilt table test is a useful test to support the diagnosis of vasovagal syncope.



[Q: 4296] OnExamination 2012 - Neurology

Which of the following is caused by a lesion of the occipital lobe?

- 1- Acalculia
- 2- Astereognosis
- 3- Constructional apraxia
- 4- Cortical blindness
- 5- Visuospatial neglect

Answer & Comments

Answer: 4- Cortical blindness

Lesions of the frontal lobe include difficulties with task sequencing and executive skills:

Expressive aphasia (receptive aphasia a temporal lobe lesion)

Primitive reflexes

Perseveration (repeatedly asking the same question or performing the same task)

Anosmia

Changes in personality.

Lesions of the parietal lobe include:

Apraxias

Neglect

Astereognosis (unable to recognise an object by feeling it)

Visual field defects (typically homonymous inferior quadrantanopia).

They may also cause acalculia (inability to perform mental arithmetic).

Lesions of the temporal lobe cause:

Visual field defects (typically homonymous superior quadrantanopia)

Wernicke's (receptive) aphasia

Auditory agnosia

Memory impairment.

Occipital lobe lesions include:

Cortical blindness (blindness due to damage to the visual cortex and may present as Anton syndrome where there is blindness but the patient is unaware or denies blindness)

Homonymous hemianopia

Visual agnosia (seeing but not perceiving objects - it is different from neglect, since in agnosia the objects are seen and followed but cannot be named).



[Q: 4297] OnExamination 2012 - Neurology

A 75-year-old woman presents with a two month history of episodic loss of vision in her right eye. Her electrocardiogram was normal and carotid ultrasound reveal a 49% stenosis of the right internal carotid artery, as assessed by the NASCAT criteria.

What is the most appropriate treatment for this patient?

1- Aspirin

2- Carotid endarterectomy

3- Dipyridamole

4- Clopidogrel

5- Warfarin

Answer & Comments

Answer: 1- Aspirin

Current NICE guidelines recommend that patients who have had a suspected TIA who are at high risk of a stroke (ABCD score of 4 or above) should have aspirin (300mg OD) started immediately. They also need specialist assessment and investigation within 24 hours of onset of symptoms. Secondary prevention measures should be introduced as soon as the diagnosis is confirmed, with consideration of individual risk factors.

The ABCD scoring system uses:

Age ≥ 60 ? (1)

BP $\geq 140/90$ mmHg at initial evaluation (1)

Clinical features (unilateral weakness 2, isolated speech disturbance 1, other 0)

Duration of symptoms (≥ 60 minutes, 10-59 minutes, <10 minutes)

Diabetes mellitus (1)

Although you cannot calculate the ABCD score with the information given in this question, aspirin remains the most appropriate answer.

Carotid endarterectomy has been established as an effective treatment for both symptomatic patients and asymptomatic patients who are shown to have carotid artery stenosis. It reduces the risk of disabling stroke or death by 48% in a person with severe symptomatic carotid stenosis ($>70\%$) who has had a TIA. The peri-operative risk of disabling stroke or death is approximately 3%. Current UK guidelines recommend endarterectomy for symptomatic patients

with greater than 70% stenosis, based on the North American Symptomatic Carotid Endarterectomy Trial which showed clear benefit. The endarterectomy should be performed as soon as the patient is fit for surgery, preferably within two weeks of a TIA.

The benefit is marginal for symptomatic patients with 50-69% stenosis, but may be greater in male patients. NICE recommends these patients are also considered for endarterectomy. There is significantly less benefit for asymptomatic patients, even those with greater than 60% stenosis. Patients with less than 50% stenosis should not be considered for carotid surgery

Recurrent stenosis can occur in 1-20% of patients following endarterectomy, and re-operation is needed in 1-3% of cases. Ipsilateral strokes occur in 9% of patients following endarterectomy, and 26% of those treated with medical management alone (within 2 years).

All patients with suspected non-disabling stroke or TIA who are considered as candidates for carotid endarterectomy should have carotid imaging within 1 week. If the patient has had a disabling stroke there is no real benefit in them undergoing the procedure.

Modified-release dipyridamole is indicated in combination with aspirin only once a TIA has been confirmed by a specialist. Alone, it is recommended only if aspirin is contraindicated or not tolerated.

Clopidogrel is recommended in patients who have had an ischaemic stroke, rather than a TIA.

Warfarin is only indicated with cerebral venous sinus thrombosis, or if the patient has atrial fibrillation.

* please note for this explanation we have used the North American Symptomatic Carotid Endarterectomy Trial (NASCET)

criteria, as opposed to the European Carotid Surgery Trialists' Collaborative Group (ECST) criteria when discussing carotid endarterectomy. Patients should be considered for endarterectomy if they have symptomatic carotid stenosis of 70-99% as assessed according to the ECST criteria. Carotid imaging reports will state which criteria are being used.



[Q: 4298] OnExamination 2012 - Neurology

A 72-year-old lady has four months of memory loss, urinary incontinence and falls.

On examination she has mild memory loss and a broad-based, slow gait. Muscle tone is normal and both plantar reflexes are downgoing.

What is the likely diagnosis?

- 1- Alzheimer's disease
- 2- Frontal lobe dementia
- 3- Multi-infarct dementia
- 4- Normal-pressure hydrocephalus
- 5- Parkinson's disease

Answer & Comments

Answer: 4- Normal-pressure hydrocephalus

Normal-pressure hydrocephalus is characterised by abnormal gait, urinary incontinence, and dementia.

It is an important clinical diagnosis, because it is a potentially reversible cause of dementia.

It is important to distinguish it from Parkinson's disease.

The onset of gait disturbance and urinary symptoms is unusual so early in dementia.

Frontal lobe dementia is characterised by loss of 'executive' functions and multi-infarct state usually has a step-wise history.



[Q: 4299] OnExamination 2012 -
Neurology

A 35-year-old woman has noticed increased clumsiness and tremor.

She has recently broken up with her partner because he found her increasingly argumentative. She has no past medical history and takes no prescribed or recreational drugs.

There is a family history of liver cirrhosis in her grandfather, who drank four bottles of whisky per week. She reports drinking less than four units per week.

What is the likely cause for her tremor?

- 1- Alcohol abuse
- 2- Huntington's disease
- 3- Lewy body dementia
- 4- Multiple sclerosis
- 5- Wilson's disease

Answer & Comments

Answer: 5- Wilson's disease

Wilson's disease is an autosomal recessive condition which causes build up of copper in the body. Copper accumulates in the liver and brain. This results in hepatitis, liver failure or cirrhosis. Accumulation in the brain can result in behavioural changes, depression, seizures, parkinsonism, however the initial sign is usually increased clumsiness.

This woman's tremor, clumsiness and behavioural change could be put down to alcohol abuse. Given the family history of cirrhosis it would be important to rule out Wilson's disease before accusing her of alcohol problems.

Huntington's disease is a neurodegenerative genetic disorder that is autosomal dominant. The features are of choreiform movements, problems with coordination and walking, behavioural and psychiatric problems. The

disease leads eventually to dementia and premature death.

Lewy body dementia is a mixture of Alzheimer's disease with Parkinson's disease. The main features are fluctuating cognition and alertness from hour to hour, visual hallucinations (usually of animal or human, and the patient may have insight into these hallucinations) and motor features of Parkinson's disease.

Multiple sclerosis would present in this age group and sex. It is due to autoimmune mediated demyelination. To make the diagnosis there must be two separate attacks separated in time and space (that is, affecting two different nerves and on two separate occasions).

The commonest signs and symptoms are

Optic neuritis

Sensory loss

Spinal cord symptoms with spasticity

Autonomic dysfunction of bladder and bowel

Constitutional symptoms such as fatigue and depression.



[Q: 4300] OnExamination 2012 -
Neurology

A 48-year old alcoholic man presents with gradually increasing confusion and drowsiness over the past two weeks.

He had previously attended the Emergency department having fallen over drunk, but had discharged himself before being reviewed by a doctor.

On examination he has multiple old bruises including one to his right arm and to the right side of his face above his eye. His BP is 150/82 mmHg, his pulse is 67 and irregular. There is 3/5 power weakness of his left arm, he is drowsy and confused.

Investigations show:

Haemoglobin 10.2 g/dl(13.5-17.7)
 White cell count $12.3 \times 10^9/L$ (4-11)
 Platelets $121 \times 10^9/L$ (150-400)
 Sodium 133 mmol/l (135-146)
 Potassium 3.9 mmol/l (3.5-5)
 Creatinine 90 $\mu\text{mol/l}$ (79-118)
 ALT 190 U/l (5-40)

Which of the following is the most appropriate intervention?

- 1- CT head
- 2- IV broad spectrum antibiotics
- 3- Lumbar puncture
- 4- Ultrasound abdomen
- 5- Upper GI endoscopy

Answer & Comments

Answer: 1- CT head

The suspicion is that this patient has a subdural haematoma. In patients with alcoholism who are more likely to have abnormal clotting, what seems like a very minor, innocuous injury may lead to a potentially serious bleed. CT head is the initial investigation of choice.

Whilst sepsis is possible, we have no indication on initial findings of a source of infection, therefore antibiotics are not appropriate.

A lumbar puncture should also be avoided until after CT head.

An ultrasound, whilst it would confirm liver changes, is unlikely to be helpful in the acute stage, and the anaemia is likely to be chronic, rather than due to an acute bleed.



[Q: 4301] OnExamination 2012 - Neurology

An 80-year-old man comes to the office to be evaluated for difficulty moving and memory

problems.

On examination he has mask-like facies and a pill-rolling tremor. His gait is bradykinetic. He is unable to look down and has been falling frequently only in the last few months. He is not orthostatic on examination

Which of the histopathological changes in this disease are similar to those found in the listed conditions?

- 1- Alzheimer's disease
- 2- Chronic progressive external ophthalmoplegia (CPEO)
- 3- Multiple system atrophy (MSA)
- 4- Prion disease
- 5- Tabes dorsalis

Answer & Comments

Answer: 1- Alzheimer's disease

Multiple system atrophy is an alpha-synucleinopathy.

Prion disease has spongiform changes.

CPEO is a mitochondrial disorder.

Tabes dorsalis is a result of inflammation from a syphilis infection.



[Q: 4302] OnExamination 2012 - Neurology

A 16-year-old girl presented with fever, headache and photophobia.

Investigations revealed:

Cerebrospinal fluid examination

Opening pressure 260 mm H₂O (50-180)

Total protein 0.8 g/l (0.15-0.45)

Glucose 4.2 mmol/l (3.3-4.4)

White cell count 60 per ml (<5)

Lymphocytes 90% (60-70)

Plasma glucose 6.4 mmol/l (3.0-6.0)

What is the most likely diagnosis?

- 1- Bacterial meningitis
- 2- Cryptococcal meningitis
- 3- Tuberculosis meningitis
- 4- Viral encephalitis
- 5- Viral meningitis

Answer & Comments

Answer: 5- Viral meningitis

Normal cerebrospinal fluid (CSF) glucose together with

A CSF lymphocytosis

An increased opening pressure, and

A raised CSF protein

are typical of a viral meningitis, which would be high on the list of differentials in patients of this age group (together with bacterial meningitis).

A handy guide to CSF findings

Read more about differential diagnoses from abnormal CSF values...



[Q: 4303] OnExamination 2012 - Neurology

A 70-year-old man has Parkinson's disease. He is started on treatment with L-dopa and dopa decarboxylase inhibitor therapy. However he continues to have troublesome tremor.

Which of the following drugs would be most likely to help?

- 1- Amantadine
- 2- Benzhexol
- 3- Propranolol
- 4- Ropinirole
- 5- Selegiline

Answer & Comments

Answer: 2- Benzhexol

Anticholinergic drugs such as benzhexol remain the treatment of choice in parkinsonian tremor.

L-dopa, selegiline and dopamine agonists are less effective in tremor.

Propranolol is the treatment of choice in essential tremor.



[Q: 4304] OnExamination 2012 - Neurology

A 77-year-old male presents with sudden loss of vision in his right eye, associated with a relative afferent pupillary defect. He has poorly controlled systemic hypertension and raised cholesterol.

What is the most likely aetiology of his presentation?

- 1- Cataract
- 2- Chronic open angle glaucoma
- 3- Macular degeneration
- 4- Retinal vascular occlusion
- 5- Retinitis pigmentosa

Answer & Comments

Answer: 4- Retinal vascular occlusion

The history of acute loss of vision affecting one eye suggests an acute vascular occlusion, especially given the associated vascular risks.

The others cause a more chronic visual loss.



[Q: 4305] OnExamination 2012 - Neurology

A 78-year-old woman presents with a six month history of episodes of giddiness and impaired consciousness.

Neurological examination is normal.

What is the most likely cause?

- 1- Alzheimer-type dementia
- 2- Chronic subdural haematoma

- 3- Creutzfeldt-Jakob disease
- 4- Depressive stupor
- 5- Normal pressure hydrocephalus

Answer & Comments

Answer: 2- Chronic subdural haematoma

Chronic subdural haematoma is a common manifestation of intermittent confusion or focal neurological deficit in the elderly population. It may mimic a stroke.

Alzheimer's dementia is usually associated with a slowly progressive cognitive impairment.

Normal pressure hydrocephalus presents with a triad of dementia, ataxia and urinary incontinence.

CJD usually presents with a rapidly progressive dementia associated with ataxia and myoclonus.



[Q: 4306] OnExamination 2012 - Neurology

A 35-year-old woman is referred with right eye pain that has deteriorated over the last week.

On examination she had a mild ptosis of the right eye and was aware of diplopia with vertical image separation on looking upwards. She also had weakness of elevation of the right eye.

What is the most likely diagnosis?

- 1- Cavernous sinus thrombosis
- 2- Graves' ophthalmopathy
- 3- Myasthenia gravis
- 4- Posterior communicating artery aneurysm
- 5- Sphenoid sinusitis

Answer & Comments

Answer: 4- Posterior communicating artery aneurysm

The signs are consistent with a partial third nerve palsy associated with periorbital pain.

In a young person a posterior communicating artery aneurysm needs to be excluded.

With cavernous sinus thrombosis one should expect some other signs such as periorbital swelling, proptosis, and conjunctival injection.

With Graves' eye disease one should expect proptosis and lid retraction.

Myasthenia gravis does not present with pain.



[Q: 4307] OnExamination 2012 - Neurology

A 42-year-old HIV-seropositive man presents to the emergency department with a two week history of global headache. His partner says that he has become increasingly confused and disorientated.

The patient's latest CD4 count, taken three weeks ago, was 50 cells/mm³. He had chosen not to take antiretroviral therapy, but was taking co-trimoxazole as prophylaxis against *Pneumocystis carinii* pneumonia.

On examination, he had mild weakness of his left arm and leg in all muscle groups and a right homonymous hemianopia. Fundoscopy was normal with no evidence of papilloedema. A CT scan of his brain showed several areas of low attenuation in both cerebral hemispheres, but there was no enhancement with contrast and no mass effect.

What is the most likely diagnosis?

- 1- Cerebral lymphoma
- 2- Cerebral toxoplasmosis
- 3- HIV encephalopathy
- 4- Neurosyphilis
- 5- Progressive multifocal leukoencephalopathy

Answer & Comments

Answer: 5- Progressive multifocal leukoencephalopathy

The most likely diagnosis is progressive multifocal leukoencephalopathy (PML), a demyelinating disease seen in advanced HIV/AIDS and caused by the JC virus.

Cerebral lymphoma and cerebral toxoplasmosis are often associated with mass effect on CT brain scanning. In CNS lymphoma there is usually a solitary lesion. Cerebral toxoplasmosis is frequently associated with multiple lesions that show ring enhancement with IV contrast.

HIV encephalopathy may be associated with confusion, but is not associated with this CT appearance. This is not a typical presentation of neurosyphilis in any of its forms.



[Q: 4308] OnExamination 2012 - Neurology

A 29-year-old lady presented to the Emergency department with a diagnosis of DVT.

She is in the third trimester of her first pregnancy and she has been 'taking it easy' by resting a lot at home.

In the department she develops a right hemiparesis.

Which of the following is the most likely underlying cardiac abnormality?

- 1- Patent ductus arteriosus
- 2- Patent foramen ovale
- 3- Primum atrial septal defect
- 4- Secundum atrial septal defect
- 5- Ventricular septal defect

Answer & Comments

Answer: 2- Patent foramen ovale

This is a 'paradoxical embolus' where a right sided thrombus has crossed into the arterial circulation.

The commonest cause is a patent foramen ovale. Although atrial septal defects are also a cause, they are more rare.



[Q: 4309] OnExamination 2012 - Neurology

Which of the following is not a recognised association of acromegaly?

- 1- Elevated serum phosphate levels
- 2- Goitre
- 3- Hypertension
- 4- Pseudogout
- 5- Reduced serum prolactin levels

Answer & Comments

Answer: 5- Reduced serum prolactin levels

Pseudogout is seen in acromegaly but not gout. Hypertension, heart failure and cardiomyopathy may occur.

Goitre is seen in 20%, along with other soft tissue swelling.

Phosphate levels are elevated but calcium levels are not significantly increased.

Thirty percent have

Elevated prolactin levels

A combination of a damaged pituitary stalk reducing the dopamine suppression signal, and

Reduced thyroid-stimulating hormone levels leading to increased thyrotropin-releasing hormone which stimulates prolactin secretion.



[Q: 4310] OnExamination 2012 - Neurology

A 25-year-old male presents with an eight

week history of difficulty walking.

On examination he had increased tone and pyramidal weakness of the right leg. There was impairment of pinprick sensation in the left leg up to the groin.

Which one of the following is the cause of these signs?

- 1- A central cauda equina lesion
- 2- A cervical spinal cord lesion
- 3- A lesion at the foramen magnum
- 4- A right sided thoracic spinal cord lesion
- 5- Bilateral cerebral hemisphere lesions

Answer & Comments

Answer: 4- A right sided thoracic spinal cord lesion

The clinical features suggest Brown-Sequard syndrome. A hemicord lesion causes it.

Ipsilateral signs include pyramidal weakness and dorsal column dysfunction (joint position and light touch) and contralateral signs include spinothalamic dysfunction (pinprick and temperature).

Causes include trauma, tumours, and multiple sclerosis.



[Q: 4311] OnExamination 2012 - Neurology

A 75-year-old female presents with an acute stroke and is noted to have a partial left homonymous hemianopia, a mild left hemiparesis and left hemisensory inattention.

Where on the right is the most likely area of infarction?

- 1- Frontal lobe
- 2- Medial temporal lobe
- 3- Occipital lobe
- 4- Parietal lobe
- 5- Thalamus

Answer & Comments

Answer: 4- Parietal lobe

A unilateral parietal lobe lesion, left or right, causes a contralateral hemihypesthesia, mild hemiparesis, parietal ataxia, homonymous hemianopia or inferior quadrantanopia and unilateral impairment of optokinetic nystagmus.

A left (usually dominant) parietal lesion causes the above signs in addition to sensory aphasia, Gerstmann syndrome (dysgraphia, dyscalculia, finger agnosia, left-right disorientation), bilateral apraxia and tactile agnosia.

A right (usually non-dominant) parietal lesion also causes left extinction phenomenon, left visual neglect, neglect of the left side of the body, anosognosia, impaired spatial processing and dressing apraxia.

Biparietal lesions result in markedly impaired orientation and spatial processing and ataxia.

An occipital lobe lesion usually causes contralateral homonymous hemianopia or quadrantanopsia. It does not typically cause hemiparesis or inattention.

Frontal lesions do not usually cause visual defects.

Temporal lobe lesions classically cause an homonymous superior quadrantanopsia. Again, there is not usually hemiparesis or inattention.



[Q: 4312] OnExamination 2012 - Neurology

A 40-year-old male presents to his GP with a two week history of numbness and a burning sensation on the lateral aspect of the left upper thigh.

Examination reveals sensory loss over the anterolateral thigh.

Which one of the following nerves is most likely to be involved in this patient?

- 1- Femoral nerve
- 2- L2 nerve root
- 3- L3 nerve root
- 4- Lateral cutaneous nerve of the thigh
- 5- Obturator nerve

Answer & Comments

Answer: 4- Lateral cutaneous nerve of the thigh

The pure sensory loss makes the diagnosis of meralgia paraesthetica and is a consequence of damage to the lateral cutaneous nerve of the thigh.

It is usually a consequence of entrapment at the lateral inguinal ligament or less likely, trauma, ischaemia or a retroperitoneal lesion.



[Q: 4313] OnExamination 2012 - Neurology

A teenage girl presents with Guillain-Barre syndrome (GBS).

Her weakness continues to worsen after admission to hospital.

Which of the following should be used to monitor her?

- 1- Arterial blood gases
- 2- Chest expansion size
- 3- FEV₁/FVC ratio
- 4- PEF
- 5- Vital capacity

Answer & Comments

Answer: 5- Vital capacity

This is the best way to monitor respiratory function in any neurological disorders that can affect the respiratory muscles (for example, GBS, myasthenia gravis).



[Q: 4314] OnExamination 2012 - Neurology

A 26-year-old previously healthy woman has a sudden onset of mental confusion.

She has a seizure and is brought to the hospital.

Her vital signs show blood pressure 100/60 mmHg, temperature 37°C, pulse 89, and respirations 22.

A lumbar puncture reveals a normal opening pressure, and clear, colourless cerebrospinal fluid (CSF) is obtained with 1 RBC and 20 WBCs (all lymphocytes), with normal glucose and protein.

An MRI scan reveals swelling of the right temporal lobe with haemorrhagic areas.

Which of the following infectious agents is the most likely cause for these findings?

- 1- Haemophilus influenzae
- 2- Herpes simplex virus
- 3- Influenza virus
- 4- Mycobacterium tuberculosis
- 5- Neisseria meningitidis

Answer & Comments

Answer: 2- Herpes simplex virus

Haemorrhagic lesions of the temporal lobe are typical for Herpes simplex virus infection.

Haemophilus influenzae is the organism most associated with meningitis in children.

Neisseria meningitidis would cause meningitis - however, in this case there are lymphocytes not neutrophils in the CSF and a normal, not low, glucose.



[Q: 4315] OnExamination 2012 - Neurology

Which statement is true regarding gabapentin?

- 1- Is a potent hepatic enzyme inducer

- 2- Is of particular value as monotherapy in absence attacks (petit mal)
- 3- Requires dose adjustment in renal disease
- 4- Side effects typically include visual field defects with long term use
- 5- Therapy is best monitored through measuring plasma concentrations

Answer & Comments

Answer: 3- Requires dose adjustment in renal disease

Gabapentin does not induce cytochrome P450 unlike other anticonvulsants such as phenytoin and phenobarbitone.

Vigabatrin may cause visual field defects, which may be irreversible. Rarely have visual disturbances been associated with gabapentin.

Gabapentin is no use in petit mal and is used for add-on therapy in partial or generalised seizures.



[Q: 4316] OnExamination 2012 - Neurology

Which of the following is true of tetanus?

- 1- Failure to culture Clostridium tetani from the wound would make the diagnosis doubtful
- 2- Infection confers lifelong immunity
- 3- There is a characteristic EEG
- 4- Clostridium-specific intravenous immunoglobulin is of no benefit once spasm has started
- 5- Cephalic tetanus causes severe dysphagia

Answer & Comments

Answer: 5- Cephalic tetanus causes severe dysphagia

A. Absence of a wound does not exclude tetanus.

B. Patients need to be actively immunised after recovery.

C. The toxin tetanospasmin does not cross the blood brain barrier, it diffuses through the blood to bind to receptors containing gangliosides on the neuronal membranes of presynaptic nerve terminals in muscles. The toxin does reach the brain by axonal transport.

D. It is ineffective once the toxin is attached to nervous tissue but may prevent progression.

E. Cephalic means involving the cranial nerves usually from a wound on the head and neck. It may be confused with rabies but hydrophobia never occurs. (OTM, 3e, 7.11.20)



[Q: 4317] OnExamination 2012 - Neurology

A 60-year-old male presents with a six month history of a gradually increasing burning sensation in his feet.

Examination revealed normal cranial nerves and higher mental function. He has normal bulk, tone, power, light touch and pinprick sensation, co-ordination and reflexes in upper and lower limbs.

With which of the following are these clinical findings consistent?

- 1- Diabetic amyotrophy
- 2- Large fibre sensory neuropathy
- 3- Motor neurone disease
- 4- Sjogren's syndrome
- 5- Small fibre sensory neuropathy

Answer & Comments

Answer: 5- Small fibre sensory neuropathy

The burning sensation described is typical of a neuropathy affecting the small unmyelinated and thinly myelinated nerve fibres.

General neurological examination and reflexes are usually normal in this type of neuropathy unless there is coexisting large (myelinated) fibre involvement.

Neuropathy affecting the large myelinated sensory fibres generally causes glove and socking sensory loss and loss of reflexes.

Conditions in which the small fibres are preferentially affected in the early stages include diabetes and amyloidosis. In the later stages however the neuropathy in these conditions also affects large fibres.

The neuropathy associated with Sjogren's syndrome is a pure sensory neuropathy (ganglionopathy).



[Q: 4318] OnExamination 2012 - Neurology

A 65-year-old man has a monotonous, slurred speech. He has an expressionless face and a festinant gait.

There is also impairment of vertical gaze.

What is the most likely underlying aetiology?

- 1- Cerebrovascular disease
- 2- Idiopathic
- 3- Shy-Drager syndrome
- 4- Steele-Richardson-Olszewski syndrome
- 5- Wilson's disease

Answer & Comments

Answer: 4- Steele-Richardson-Olszewski syndrome

Parkinson's disease is a triad of

Bradykinesia

Tremor and

Rigidity.

Speech may be slurred and without accents or emphasis. Impairment of vertical gaze suggests the diagnosis of Steele-Richardson-

Olszewski syndrome or supranuclear gaze palsy, which also cause pyramidal signs, dementia or frontal lobe syndrome.

Response to L-dopa is poor and median survival is about seven years.

Shy-Drager syndrome is associated with autonomic dysfunction and postural hypotension.

Wilson's disease presents in children and young adults with cirrhosis and parkinsonism, which later leads to dementia, dysphagia and immobility.



[Q: 4319] OnExamination 2012 - Neurology

A 36-year-old police officer presents with a three day history of slurred speech. She also complains of double vision and a sensation of breathlessness.

The oxygen saturations are 99% on air. Neurological examination reveals normal power, reflexes and plantar responses.

Which of the following would improve symptoms in this presentation?

- 1- G-CSF
- 2- Edrophonium
- 3- Non-steroidal anti-inflammatory drugs
- 4- Physiotherapy
- 5- Plasmapheresis

Answer & Comments

Answer: 2- Edrophonium

This lady has symptoms suggesting myasthenia gravis.

Her breathlessness is probably secondary to anxiety about the symptoms and associated hyperventilation.

Edrophonium (Tensilon) is sometimes used in the diagnosis of myasthenia gravis and would

be expected temporarily to improve symptoms.



[Q: 4320] OnExamination 2012 - Neurology

A 45-year-old man presents with an insidious onset of binocular horizontal diplopia and left sided facial pain.

On examination he has a left abducens nerve palsy and numbness over the maxillary division of the left trigeminal nerve.

Of the following which is the most likely anatomical site of his neurological lesion?

- 1- Cavernous sinus
- 2- Cerebellopontine angle
- 3- Midbrain
- 4- Petrous apex
- 5- Superior orbital fissure

Answer & Comments

Answer: 4- Petrous apex

In the pre-antibiotic era an abducens nerve palsy with ipsilateral pain and numbness was due to petrous osteitis (Gradenigo syndrome) but is now more likely the result of a meningioma or nasopharyngeal carcinoma of the petrous apex.

The cavernous sinus syndrome consists of variable involvement of

Oculomotor (III)

Trochlear (IV)

Abducens (VI)

Trigeminal (ophthalmic and maxillary division) (V) and

Oculo-sympathetic nerves.

The superior orbital fissure syndrome is similar to the cavernous sinus syndrome except for the presence of proptosis.

Lesions of the cerebellopontine angle causes compression of cranial nerves V (trigeminal), VII (facial) and VIII (vestibulocochlear).

Lesions of the midbrain cause a variety of symptoms, depending on the exact area affected.



[Q: 4321] OnExamination 2012 - Neurology

A 67-year-old man is admitted to the Emergency department with drooling, tongue and lip swelling and tachypnoea. He has COPD, angina, diabetes and hypertension.

He was at home when the incident occurred, and had not recently been in contact with anything new. He has no known allergies and his medication has not changed in the past year.

What is the likely cause of his symptoms?

- 1- Aspirin
- 2- Diltiazem
- 3- Enalapril
- 4- Food allergy
- 5- Tetanus

Answer & Comments

Answer: 3- Enalapril

This gentleman has angioedema.

This is a side effect of angiotensin-converting enzyme inhibitor (ACEi) and to a lesser extent angiotensin receptor blocker (ARB). It does not necessarily occur as soon as the medication is started.

There is nothing pointing towards it being a food or drug allergy as he has not done anything different from normal.

Tetanus results in lock jaw and there is usually a history of injury.

The commoner side effects of diltiazem are leg swelling, bradycardia, AV node block and gastrointestinal (GI) disturbance.

The commoner side effects of aspirin are reflux or acid symptoms, with the possibility of GI bleed.



[Q: 4322] OnExamination 2012 -
Neurology

A 40-year-old man has been in a road traffic accident. His GCS is 8.

Which of the following could describe his condition?

- 1- A man lying still, eyes open and quiet. On questioning he appears confused. He is able to raise his eyebrows on command but cannot move his arms or legs at all. An MRI has shown damage to his spinal cord at C3.
- 2- A man lying still, eyes shut and groaning. Not responding to voice. On firm nail bed pressure he opens his eyes and withdraws his hand.
- 3- A man lying still, eyes shut, not making any noise. On command he opens his eyes and raises his hands but still makes no sound.
- 4- A man writhing around, eyes open and calling out obscenities. He smells strongly of alcohol. He variably obeys verbal commands.
- 5- A man writhing around, eyes open and screaming. Not responding to voice or following commands. On firm nail bed pressure he pushes your hand away.

Answer & Comments

Answer: 2- A man lying still, eyes shut and groaning. Not responding to voice. On firm nail bed pressure he opens his eyes and withdraws his hand.

The Glasgow coma scale (GCS) can be useful as a predictor of outcome and a way to

measure and monitor patients with reduced consciousness.

It is made up of three components: Eye opening, best verbal response and best motor response. Each of these is scored.

Eye opening:

Spontaneously = 4

To speech = 3

To painful stimulus = 2

No response = 1

Best verbal response:

Orientated = 5

Disorientated = 4

Inappropriate words = 3

Incomprehensible sounds = 2

No response = 1

Best motor response:

Obeys verbal commands = 6

Localises painful stimuli = 5

Withdrawal to pain = 4

Flexion to pain = 3

Extension to pain = 2

No response = 1

The Glasgow coma scale defines coma as E = 2, M = 4, V = 2 or less.

The GCS is meaningless unless it is broken down into its components.

The GCS is unreliable and should not be applied to patients who are inebriated, intubated or who have a therapeutic or traumatic paralysis.

A. This is not the correct answer. This man may well have a high C-spine lesion so the GCS score is unreliable. He would score 4 for eyes and 4 for verbalisation. You could argue

that raising his eyebrows on command is a best motor response of 5, or give him a score of 1 for not being able to move his limbs on command.

B. . E = 2, V = 2, M = 4.

C. This is not the correct answer. E = 3, V = 1, M = 5.

D. This is not the correct answer. This man sounds as though he may be drunk making the GCS unreliable. From the description, taking his best verbal and motor skills his GCS is E = 4, V = 4-5 (depending on the context and content of the obscenities), M = 6.

E. This is not the correct answer. E = 4, V = 2, M = 5.



[Q: 4323] OnExamination 2012 - Neurology

A 60-year-old male is accompanied to the office by his wife who has noticed that his memory is deteriorating. She also reports that at dinner parties he is inappropriate in his behavior and she thinks that his personality has changed.

On examination the patient has frontal lobe release signs. He is hypotonic in the arms but his reflexes are brisk. He has fasciculations in the tongue and in all four limbs.

You suspect frontotemporal dementia (FTD) with amyotrophic lateral sclerosis (ALS).

On which chromosome is the responsible gene located?

- 1- Chromosome 3
- 2- Chromosome 9
- 3- Chromosome 17
- 4- Chromosome 19
- 5- Chromosome 22

Answer & Comments

Answer: 2- Chromosome 9

Although frontotemporal dementia is associated with chromosome 17, when there is motor neuron disease (MND) associated the chromosome linked to the disorder is 9.



[Q: 4324] OnExamination 2012 - Neurology

A 74-year-old man comes to the clinic with his wife. He has been suffering from increasingly frequent falls and now has marked problems with his mobility.

Past history of note includes an inferior MI and TIA a few years earlier. He has also suffered from two episodes of urinary retention and now has an indwelling catheter.

On examination his BP is 142/72 mmHg, with a postural drop of 30 mmHg on standing. He has a quiet ejection systolic murmur, his chest is clear, and abdominal examination is unremarkable.

Neurological examination reveals loss of upward gaze, cogwheel rigidity and bradykinesia. He has a mild tremor only.

Investigations show

Haemoglobin 12.8 g/dl(13.5-17.7)

White cells $5.3 \times 10^9/L$ (4-11)

Platelets $221 \times 10^9/L$ (150-400)

Sodium 139 mmol/l (135-146)

Potassium 4.7 mmol/l (3.5-5)

Creatinine 138 $\mu\text{mol/l}$ (79-118)

Which of the following is the most likely diagnosis?

- 1- Idiopathic parkinsonism
- 2- Lewy body disease
- 3- Multi-infarct disease
- 4- Multi-system atrophy
- 5- Pick's disease

Answer & Comments

Answer: 4- Multi-system atrophy

The particular features of autonomic dysfunction seen here, with postural hypotension and urinary retention, coupled with the loss of upward gaze and parkinsonism point towards a diagnosis of multi-system atrophy.

As here, whilst the motor symptoms are parkinsonian in nature, the tremor is often less pronounced than in a patient with idiopathic Parkinson's.

The Parkinson's symptoms associated with multi-system atrophy usually respond poorly to dopamine agonists or L-dopa, in contrast to idiopathic Parkinson's.

Urinary retention can be managed with an indwelling catheter if required, and postural hypotension managed with support stockings plus mineralocorticoids if required.



[Q: 4325] OnExamination 2012 - Neurology

A 35-year-old man presents to the Emergency department complaining of severe pain in his lower back after lifting a heavy box at work. The pain radiates to his right buttock and thigh. He has had no urinary symptoms.

On examination he can straight leg raise to 90 degrees on the left side but only to 30 degrees on the right. Sciatic stretch test is positive.

He has difficulty plantarflexing his right ankle and has abnormal sensation on the plantar aspect of the foot. His right ankle reflex is absent but all other reflexes are normal. There is no other sensory disturbance.

What is the likely diagnosis?

- 1- Cauda equina syndrome
- 2- L3/L4 disc prolapse
- 3- L4/L5 disc prolapse
- 4- L5/S1 disc prolapse
- 5- Old Shuerman's disease

Answer & Comments

Answer: 4- L5/S1 disc prolapse

An L5/S1 disc prolapse affects the S1 nerve root causing

Sensory loss to the posterior calf and the plantar surface of the foot

Motor loss to gastrocnemius and soleus and

Loss of ankle jerk.



[Q: 4326] OnExamination 2012 - Neurology

A 34-year-old male presents with weakness of the right hand. You note global wasting of the small hand muscles, there is also sensory loss over the medial border of the forearm and hand.

He says he was climbing a tree to rescue a kite and fell. Whilst falling he grabbed a branch and this pulled on his arm.

Injury to which of the following structures is the most likely explanation of this clinical presentation?

- 1- Cervical spine
- 2- Lower brachial plexus
- 3- Median nerve in the forearm
- 4- Radial nerve in the upper arm
- 5- Ulnar nerve at the elbow

Answer & Comments

Answer: 2- Lower brachial plexus

This is a classic story of a lower brachial plexus injury; sudden upward movement of the abducted arm. This causes features of an ulnar nerve palsy which is supplied by the lower brachial plexus roots C8 and T1.

The median and radial nerves can be excluded because of the typical ulnar nerve findings.

The ulnar nerve can be damaged at the elbow from chronic pressure, leaning on the elbows, and direct trauma.

However, this injury is a stretching injury of the arm.

A cervical spine injury would be expected to have other associated neurological signs.



[Q: 4327] OnExamination 2012 - Neurology

A 45-year-old woman presents to the Emergency department complaining of a severe headache and vomiting for 12 hours.

She was previously well and takes no medication.

On examination, her temperature was 37.5°C, her pulse rate was 110 beats per minute and her blood pressure was 95/60 mmHg. There was some neck stiffness and there was a right third nerve palsy with pupillary involvement.

Her initial investigations show:

Haemoglobin 13.6 g/dL (11.5-16.5)

White cell count $14.5 \times 10^9/L$ (4-11 $\times 10^9$)

Platelets $>450 \times 10^9/L$ (150-400 $\times 10^9$)

Sodium 122 mmol/L (137-144)

Potassium 5.2 mmol/L (3.5-4.9)

Urea 4.6 mmol/L (2.5-7.5)

Creatinine 85 $\mu\text{mol/L}$ (60-110)

Random cortisol 150 nmol/L (200-700)

TSH 1.1 mU/L (0.4-5)

Free T_4 9 pmol/L (10-22)

Prolactin 350 mU/L (<450)

What is the most likely diagnosis?

- 1- Encephalitis
- 2- Meningitis
- 3- Migraine
- 4- Pituitary apoplexy
- 5- Subarachnoid haemorrhage

Answer & Comments

Answer: 4- Pituitary apoplexy

The combination of headache, vomiting, visual disturbance and hormonal dysfunction should lead you to consider a diagnosis of pituitary apoplexy in this case.

Pituitary apoplexy is caused by acute haemorrhage or infarction of the pituitary gland. A pituitary adenoma usually pre-exists.

The visual symptoms include reduced acuity, visual field impairment and ocular motility dysfunction. This is due to involvement of the optic nerve, chiasm and cavernous sinus.

Predisposing factors include bromocriptine, head injury, pregnancy, irradiation and endocrine stimulation tests.

Endocrinologically, the main initial problem is a lack of adrenocorticotrophic hormone (ACTH), which results in a lack of cortisol and the features of an 'Addisonian crisis', i.e. hypotension, hyponatraemia, hyperkalaemia and hypoglycaemia. Subacutely, there can be deficiency in thyroid stimulating hormone (TSH) and gonadotropins (LH and FSH).

The raised white cell count and thrombocytosis here likely reflects a stress response.

Treatment is with urgent steroid replacement and imaging to confirm the diagnosis, with consideration of neurosurgical decompression.

Subarachnoid haemorrhage is a possibility in this case, but the hormone dysfunction makes pituitary apoplexy more likely.

The hormone dysfunction also make the other options less likely. Altered mental status is usually more dominant in cases of encephalitis. Whilst migraine can imitate a number of different conditions, this lady is extremely unwell and migraine does not account for this.



[Q: 4328] OnExamination 2012 -
Neurology

A 45-year-old man presents with headaches and low libido.

He is found to be hypopituitary.

The CT scan shows a pituitary tumour with suprasellar extension.

Which of the following structures is likely to be compressed?

- 1- Abducens nerve
- 2- Hypothalamus
- 3- Oculomotor nerve
- 4- Optic chiasm
- 5- Third ventricle

Answer & Comments

Answer: 4- Optic chiasm

Superior extension of the tumour can lead to compression of firstly the optic apparatus and later the hypothalamus.

Lateral extension of the tumour with compression or invasion of the cavernous sinus can compromise third, fourth, or sixth cranial nerve functions, manifest as diplopia in 5 to 15% of pituitary tumour patients.

The optic chiasm lies 5-10 mm above the diaphragm sellae and anterior to the stalk.

Adenomas larger than 1.5 cm frequently have suprasellar extension, and a magnetic resonance imaging (MRI) scan will show compression and upward displacement of the optic chiasm.



[Q: 4329] OnExamination 2012 -
Neurology

A 75-year-old man is awaiting transurethral resection of the prostate, but is brought into hospital in acute urinary retention.

Which of the following drugs might be responsible?

- 1- Ipratropium bromide inhaler
- 2- Montelukast
- 3- Serevent inhaler
- 4- Sodium chromoglycate
- 5- Theophylline

Answer & Comments

Answer: 1- Ipratropium bromide inhaler

Ipratropium bromide acts as an antimuscarinic bronchodilator and has traditionally been regarded as more effective in relieving bronchoconstriction associated with chronic bronchitis.

Side effects are rare and it does not increase sputum viscosity or affect the mucociliary clearance of sputum.

Reported side effects are dry mouth, blurred vision, constipation and urinary retention.

The nebulised drug has occasionally been reported to leak around the mask and precipitate acute angle closure glaucoma in susceptible patients.



[Q: 4330] OnExamination 2012 -
Neurology

A 42-year-old male with a 15 year history of type 1 diabetes presents with a two month history of deteriorating pain and stiffness of the right shoulder.

On examination he has painful limitation of internal rotation and can abduct the right arm to only 90 degrees. Flexion is relatively unimpaired. There is some weakness of movement of that shoulder with slight wasting of shoulder muscles. He has some reduced vibration sensation in both hands.

Which of the following is the most likely diagnosis?

- 1- Adhesive capsulitis
- 2- Brachial plexopathy

- 3- Calcium pyrophosphate arthropathy
- 4- Diabetic arthropathy
- 5- Rheumatoid arthritis

Answer & Comments

Answer: 1- Adhesive capsulitis

This patient has typical features of a frozen shoulder and this is typified by the reduced internal rotation and abduction of the shoulder. Slight wasting due to pain and reduced use of the shoulder muscles is expected.

Brachial plexopathy is associated with involvement of the brachial plexus with associated specific dermatomal loss of sensation (not the peripheral neuropathy associated with diabetes as in this case) as well as specific loss of strength (not often the shoulder) such as wrist drop, ulna nerve palsy, etc.



[Q: 4331] OnExamination 2012 - Neurology

A 17-year-old female presents with three headaches over a six month period.

She describes the headaches as severe, right-sided and lasting for twelve hours and associated with nausea and photophobia. Each is preceded by spots before her eyes.

What is the most appropriate initial treatment for this patient?

- 1- Diclofenac at the onset of the next attack
- 2- Ergotamine suppository at the onset of the next attack
- 3- Paracetamol plus metoclopramide at the onset of the next attack
- 4- Prophylaxis with propranolol
- 5- Sumatriptan at the onset of the next attack

Answer & Comments

Answer: 3- Paracetamol plus metoclopramide at the onset of the next attack

First line treatment of acute migraine consists of simple analgesic (either soluble paracetamol or aspirin) and an antiemetic (usually domperidone or metoclopramide).

Second line treatment includes the use of non-steroidal-anti-inflammatory drugs such as diclofenac.

If the above measurements fail to alleviate the attacks, then triptan therapy (for example, sumatriptan) is indicated.

It is important for patients to take the treatment as early as possible.

Long term prophylaxis with drugs (for example, propranolol) is only indicated if the attacks are frequent (more than two a month).



[Q: 4332] OnExamination 2012 - Neurology

A 28-year-old shop worker is referred with a three month history of recurrent episodes of disorientation and confusion.

Her boyfriend has found her wandering around the house on several occasions, apparently with no idea of where she is or how she got there. Her mood has been very low, with frequent emotional outbursts, and she has considered leaving her job because of problems with working the computer and managing customers' queries. Her boyfriend feels her condition is significantly worsening.

Physical examination is normal, apart from recurrent, asymmetrical, jerks in all four limbs.

Which of the following investigations is likely to be most useful in reaching a diagnosis?

- 1- Chest x ray
- 2- CT head
- 3- EEG

- 4- Liver function tests
- 5- Visual evoked potentials

Answer & Comments

Answer: 3- EEG

This kind of rapid cognitive decline in a young person with myoclonus is strongly suggestive of Creutzfeldt-Jakob disease (CJD).

A definitive diagnosis of any form of CJD requires pathological examination of brain tissue, which is usually only done post-mortem. During life, investigations are undertaken for two reasons: to exclude other possible diagnoses, and to support the diagnosis of CJD. Supportive investigations are EEG, CSF examination and MRI.

The EEG in sporadic CJD may show significant abnormalities involving deep brain areas such as the thalami. The normal rhythms are gradually lost. Initially the changes are diffuse, and non-specific, developing into generalised bi- or triphasic periodic sharp wave complexes with a frequency of 1-2 per second. High voltage sharp waves may be synchronous with myoclonic jerks. In an appropriate clinical context, this EEG pattern is strongly suggestive of a diagnosis of CJD.

Neither CSF examination nor MRI are options here, but both can also give supportive information.

The CSF typically contains no inflammatory cells, but the total protein content may be raised. Analysis for brain specific proteins, particularly 14-3-3, is supportive in the right clinical context.

In a proportion of cases, abnormalities of signal in the anterior basal ganglia (caudate/putamen, and sometimes the cortex) can be seen on MRI, which can also support the diagnosis.

Chest x ray and liver function tests may help to exclude other diagnoses, but do not give supportive information for CJD.

Visual evoked potentials may be altered in CJD, but no specific pattern has yet been identified to support the diagnosis.

CT head generally demonstrates brain atrophy in CJD, but this is not a specific finding and is therefore less useful than an EEG.



[Q: 4333] OnExamination 2012 - Neurology

A 79-year-old male is admitted with acute confusion and is agitated and aggressive to staff.

His relatives who accompany him assert that he had been entirely self-caring, does not drink alcohol and was taking no previous medication. He was diagnosed with a urinary tract infection and commenced antibiotics but remained agitated and distressed.

Which one of the following treatments is the most appropriate for his agitation?

- 1- Chlorpromazine
- 2- Diazepam
- 3- Quetiapine
- 4- Temazepam
- 5- Trazodone

Answer & Comments

Answer: 3- Quetiapine

Unfortunately all antipsychotics appear to increase the risk of death in patients with dementia. Haloperidol, olanzapine and risperidone may also increase the risk of cerebrovascular events. Olanzapine and risperidone have been shown to increase risk of somnolence, hostility, confusion, fever, abnormal gait, urinary incontinence, asthenia and peripheral oedema. 50% of patients with dementia with Lewy bodies have marked

sensitivity to antipsychotics, with associated raised mortality. Antipsychotics are therefore only indicated in specific situations.

However, in patients with clinically significant agitation, there is evidence that both antipsychotics and benzodiazepines produce benefits that outweigh the risks. Current evidence suggests that the best agent for acute agitation in an elderly patient such as this is quetiapine administered either intramuscularly (IM) or orally.

Benzodiazepines are associated with increased risk of falls, sedation and cognitive impairment and are therefore second line. Lorazepam is the benzodiazepine of choice. Temazepam has a delayed onset of action and is therefore not ideal for this patient, whilst oral diazepam also has too long a duration of action to be of any use as an acute sedative in the elderly.

Trazodone, an anti-depressant, is useful orally as a chronic anxiolytic. Its onset of action is too long to be used acutely.



[Q: 4334] OnExamination 2012 - Neurology

A 50-year-old man presents with tingling in the left upper limb. The pain originated in the neck and radiated down the left arm. He proceeded to have numbness and paraesthesia in the left lower limb.

On examination he had restriction of neck movements and there was a mild wasting to be noted in the left biceps. There was inversion of the supinator and biceps jerks. His knee jerk and ankle jerk were hyperreactive and he has a positive extensor plantar response.

He then developed paraesthesia and numbness of the right lower limb. A diagnosis of cord compression was made and he underwent a surgical decompression.

Post surgery was complicated by septicaemia and urinary tract infection and he remained in

bed for four days. He subsequently developed inability to dorsiflex his right foot and right big toe. There was numbness on the outside of the foot and there was decreased eversion, but inversion was normal. His reflexes remained as before.

What is the cause of the problem?

- 1- Common peroneal nerve palsy
- 2- L4 root lesion
- 3- Recurrence of the original cord compression
- 4- Sciatic nerve palsy
- 5- Spinal cord infarction

Answer & Comments

Answer: 1- Common peroneal nerve palsy

The commonest cause of acute foot drop after prolonged bed rest is entrapment common peroneal neuropathy at the neck of fibula.

Typically there is weakness of ankle dorsiflexion, eversion, diminished sensation of the lateral aspect of leg and dorsum of foot.

The ankle reflex remains intact.



[Q: 4335] OnExamination 2012 - Neurology

A 75-year-old woman presents with acute monocular visual loss.

Fundoscopy reveals a swollen pale optic disc in the affected eye.

What is the most likely diagnosis?

- 1- Central retinal vein occlusion
- 2- Closed angle glaucoma
- 3- Giant cell arteritis
- 4- Optic neuritis
- 5- Raised intracranial pressure

Answer & Comments

Answer: 3- Giant cell arteritis

The presence of a swollen optic disc suggests ischaemic optic neuropathy.

In elderly people giant cell arteritis is a common presentation of acute monocular visual loss.

Optic neuritis is very rare in people over the age of 50.

You would expect bilateral swollen optic discs in raised intracranial pressure.

In central retinal vein occlusion you would expect diffuse retinal haemorrhages.



[Q: 4336] OnExamination 2012 - Neurology

Gaucher's disease is associated with the deficiency of which of the following?

- 1- Arylsulphatase-A
- 2- B-Glucosidase
- 3- Hexosaminidase A
- 4- Iduronidase
- 5- Sphingomyelinase

Answer & Comments

Answer: 2- B-Glucosidase

Hexosaminidase A deficiency is associated with Tay-Sachs disease.

Sphingomyelinase deficiency is associated with Niemann-Pick disease.

Arylsulphatase-A deficiency is associated with metachromatic leucodystrophy.

Iduronidase deficiency is associated with Hurler's syndrome.



[Q: 4337] OnExamination 2012 - Neurology

A 21-year-old female presented with a

sudden onset of left sided head and neck pain.

Twenty four hours later she presents with sudden onset of right hemiparesis, facial weakness and homonymous hemianopia and left Horner's syndrome.

A CT brain showed a left middle cerebral artery territory infarction.

Which of the following is the most likely diagnosis?

- 1- Antiphospholipid syndrome
- 2- Cardiac embolism
- 3- Left carotid artery dissection
- 4- Migraine
- 5- Systemic vasculitis

Answer & Comments

Answer: 3- Left carotid artery dissection

The two commonest causes of young onset stroke (less than 40 years) are cardioembolism and carotid artery dissection.

Carotid artery dissection is either spontaneous or traumatic. Facial/head/neck pain and Horner's syndrome are characteristic features.

Migrainous stroke usually affects the posterior circulation (posterior cerebral artery territory is the commonest).



[Q: 4338] OnExamination 2012 - Neurology

Chronic subdural haematoma in a 75-year-old man is not associated with the presence of which of the following?

- 1- Bilateral papilloedema
- 2- Hemiparesis
- 3- Fluctuating level of consciousness
- 4- Impaired cognitive function
- 5- Internuclear ophthalmoplegia

Answer & Comments

Answer: 5- Internuclear ophthalmoplegia

Chronic subdural haematoma is classically associated with fluctuating conscious level and cognitive function.

Bilateral papilloedema may occur with raised intracranial pressure.

Bilateral internuclear ophthalmoplegia is associated with multiple sclerosis and unilateral lesions of medial longitudinal fasciculus may occur with small brain stem infarcts.

Unequal pupils are associated with rapid transtentorial coning in extradural haemorrhage leading to ipsilateral dilated pupil followed by bilateral fixed dilated pupils.



[Q: 4339] OnExamination 2012 - Neurology

A 47-year-old man presents with memory impairment worsening over nine months.

He has jerking movements of his limbs and biphasic high-amplitude sharp waves on EEG.

Which diagnosis is most likely?

- 1- Alzheimer's disease
- 2- Creutzfeld-Jakob disease
- 3- Multi-infarct dementia
- 4- Normal pressure hydrocephalus
- 5- Pick's disease

Answer & Comments

Answer: 2- Creutzfeld-Jakob disease

Biphasic high-amplitude sharp waves are characteristic of Creutzfeld-Jacob disease.

However the young age, rapid onset and myoclonus make this diagnosis the most likely.



[Q: 4340] OnExamination 2012 - Neurology

Which of the following will not be affected by a lesion of the facial nerve in the internal auditory meatus?

- 1- Blinking
- 2- Hearing
- 3- Lacrimation
- 4- Sweating over the cheek
- 5- Taste

Answer & Comments

Answer: 4- Sweating over the cheek

The extent of dysfunction depends on the level of injury.

If it is proximal to geniculate ganglion, for example, internal auditory meatus, taste is lost in the anterior 2/3 of tongue. Also secretion from submandibular, sublingual and lacrimal glands is impaired.

Hyperacusis is due to paralysis of stapedius. Orbicularis oculi is affected causing inability to blink/close eyelids.

Sensation over the face is supplied by the trigeminal nerve, and sweat glands are controlled by the sympathetic nervous system, for example, anhidrosis in Horner's syndrome.



[Q: 4341] OnExamination 2012 - Neurology

A 75-year-old man is diagnosed with a Lewy body dementia.

Which one of the following drugs would be contraindicated for this patient?

- 1- Chlormethiazole
- 2- Donepezil
- 3- Haloperidol
- 4- L-Dopa

5- Selegiline

Answer & Comments

Answer: 3- Haloperidol

Diffuse Lewy body disease is the third commonest cause of dementia (after Alzheimer's disease and vascular dementia).

It presents with:

Cognitive impairment

Visual hallucinations

Parkinsonism.

A common manifestation of the disease is severe neuroleptic treatment intolerance which can be fatal.



[Q: 4342] OnExamination 2012 - Medicine

A 22-year-old male nurse presents to the emergency department following a fight in a pub. In self defence, during a messy brawl between patients, he punched a patient in the face and sustained a deep laceration to his knuckle from his assailant's tooth.

After the wound is cleaned and he has received tetanus immunisation, which of the following antibiotic regimes would be most appropriate for this patient?

- 1- Co-amoxiclav oral
- 2- Doxycycline oral
- 3- Flucloxacillin oral
- 4- Penicillin G IM
- 5- Trimethoprim oral

Answer & Comments

Answer: 1- Co-amoxiclav oral

There is little research into this area but human bites are notorious for causing infection.

This type of closed fist injury is very susceptible to deep infection because the tendon can be infected at the point of injury and then, when the hand relaxes, it slips back into its sheath and is impossible to clean fully.

Broad spectrum antibiotics, typically co-amoxiclav, are used.



[Q: 4343] OnExamination 2012 - Medicine

A patient has daytime sleepiness. He wakes up in the morning un-refreshed. He frequently dozes off while watching TV.

He is hypertensive but well controlled with amlodipine 5 mg and ramipril 2.5 mg. He occasionally takes paracetamol for back pain. Neurological examination was normal. His BMI is 45.

His thyroid function tests were normal as well as IGF-1.

Obstructive sleep apnoea (OSA) is suspected.

Which of the following would make OSA more likely?

- 1- Cataplexy
- 2- High Epworth sleepiness score
- 3- Low Epworth sleepiness score
- 4- Low hypocretin levels in CSF
- 5- Witness of snoring during sleep

Answer & Comments

Answer: 2- High Epworth sleepiness score

Epworth sleepiness score consists of questions which are marked out of 24.

Scores greater than 9 raise the suspicion of the possibility of OSA. It should be interpreted in the context of history.

Those with high scores should be referred for further assessment.



[Q: 4344] OnExamination 2012 - Medicine

A 26-year-old man presents with gradual onset of cough and shortness of breath on exertion. He has no medical history of note. He is single and smokes 20/ day.

His O₂ sat is 93% but drops on minimal exertion. Chest examination was unremarkable. A chest x ray is requested.

What is the most likely diagnosis?

- 1- Asthma
- 2- COPD
- 3- Lung abscess
- 4- Pneumocystis carinii pneumonia (PCP)
- 5- Pulmonary embolism

Answer & Comments

Answer: 4- Pneumocystis carinii pneumonia (PCP)

In PCP there is O₂ desaturation after minimal exertion.

Chest x ray classically shows bilateral perihilar shadowing.

Smoking was a distractor.



[Q: 4345] OnExamination 2012 - Medicine

An 83-year-old man is admitted with light-headedness and bradycardia.

An ECG shows sinus bradycardia with a PR interval of 0.18s. You note that he is taking labetalol. On further questioning he tells you that he has been taking labetalol at the same dose for years.

His estimated glomerular filtration rate (eGFR) is 60ml/min/1.73m².

Which of the following would most accurately describe the reason for developing bradycardia?

- 1- He has developed age-related sinus node dysfunction
- 2- Increased absorption due to slower gastric emptying
- 3- Labetalol follows zero order kinetics that change with age
- 4- Reduced first pass metabolism
- 5- Reduced glomerular filtration rate and excretion

Answer & Comments

Answer: 4- Reduced first pass metabolism

Answer D is correct because drugs like labetalol undergo extensive first pass metabolism in the liver. Liver mass and blood flow decrease with age which in turn increases

the bioavailability of drugs like labetalol giving rise to greater therapeutic effect.

The patient may have taken the same dose of drugs for years, but as the liver ages the bioavailability of the drugs increases as described above.



[Q: 4346] OnExamination 2012 - Medicine

A 47-year-old man with confusion is brought into the emergency department via ambulance.

He has a history of alcohol abuse and is currently living in a homeless shelter. On questioning he reports feeling generally unwell for several months with malaise and weight loss. He has recently complained of a headache to workers at the house, and has been acting strangely over the last few days.

He was treated for tuberculosis (TB) two years ago, but was non-compliant with medication. He is investigated and diagnosed with cerebral tuberculosis. He is commenced on rifampicin, pyrazinamide, ethambutol and isoniazid. He is also started on steroid therapy.

For how long should treatment be continued in total?

- 1- 2 months
- 2- 4 months
- 3- 6 months
- 4- 8 months
- 5- 12 months

Answer & Comments

Answer: 5- 12 months

Worldwide TB affects 10 million people and causes two million deaths.

In developed countries it is relatively uncommon. Those who are elderly, malnourished or immunocompromised (HIV,

diabetes, alcoholism, corticosteroid therapy) are susceptible.

Uncomplicated pulmonary TB is treated for a total of six months, with a three or four drug regime continued for two months followed by using rifampicin and isoniazid for the remaining four months.

In meningeal or cerebral TB, a four drug regime is continued for 12 months (use of steroids is also recommended) to ensure adequate brain penetration and to prevent cranial nerve compression by meningeal scarring. Current NICE guidelines recommend a treatment regimen of isoniazid, pyrazinamide, rifampicin and a fourth drug (for example, ethambutol) for the first 2 months, followed by isoniazid and rifampicin 10 months. In addition a glucocorticoid (equivalent to prednisolone 20-40 mg) is recommended for the first 2-3 weeks, then with gradual reduction.



[Q: 4347] OnExamination 2012 - Medicine

A 25-year-old chef undergoes a Mantoux test as a colleague has just tested positive for sputum positive tuberculosis.

Which of the following response would indicate she has been infected with the disease?

- 1- 3mm
- 2- 6mm
- 3- 9mm
- 4- 12mm
- 5- 18mm

Answer & Comments

Answer: 5- 18mm

The Mantoux test replaced the Heaf test in 2005 in the UK. One of its uses is for patients who have had close contact with a person known to have tuberculosis.

The injection site should be reviewed 48-72 hours following intradermal inoculation of tuberculin. The left forearm is typically used. Only the induration, not surrounding erythema, is used in the measurement and the longest diameter is measured in millimetres:

Less than 6mm: negative test, previously unvaccinated individuals can be given the BCG (within three months) provided there are no contraindications

More than 6mm but less than 15mm: hypersensitive to tuberculin protein (may be due to previous TB infection, BCG, or atypical mycobacteria). Patients are not given the BCG if part of an immunisation programme. However, in other contexts (e.g. immigrant screening and contact tracing), further investigation should and follow-up may be indicated.

More than 15mm: strongly hypertensive to tuberculin, suggestive of TB infection. Patients should be referred for further investigation and treatment

The reaction to tuberculin protein may be suppressed by viral infections, live viral vaccines, sarcoidosis, corticosteroids, immunosuppression, severe tuberculous disease and poor nutrition.



[Q: 4348] OnExamination 2012 - Medicine

A 69-year-old woman presents to the medical admission unit with a two month history of increasing lethargy and confusion. She also complains of headaches, and on the day of admission her husband reports her speech has become slurred.

An urgent CT head is performed, and is reported as showing several cerebral metastases with surrounding oedema. She is started on high dose dexamethasone with some improvement in her symptoms.

Which of the following investigations has the greatest chance of identifying the primary tumour?

- 1- Chest x ray
- 2- Cystoscopy
- 3- Mammography of the breast
- 4- Sigmoidoscopy
- 5- Ultrasound of the kidneys

Answer & Comments

Answer: 1- Chest x ray

Approximately 20% of people who die from cancer have brain metastases. These can be solitary or multiple.

The most common sites that metastasise to the brain are; lung (44%), breast (10%), kidney (7%), gastrointestinal tract (6%) and melanoma (skin - 3%).

Therefore a chest x ray would be the initial investigation of choice, with the greatest chance of finding the primary.



[Q: 4349] OnExamination 2012 - Medicine

A 29-year-old junior doctor comes to the Emergency department complaining of a severe headache and neck stiffness. He has had mild diarrhoea over the past few days, and some coryzal symptoms.

On examination his BP is 155/82 mmHg, his pulse is 85 and regular and his temperature is 37.8°. He has signs consistent with severe meningism but there are no skin rashes or other signs of vasculitis.

Investigations show:

Haemoglobin 13.8 g/dl(13.5-17.7)

White cells $8.9 \times 10^9/L$ (4-11)

Platelet $183 \times 10^9/L$ (150-400)

Sodium 141 mmol/(135-146)

Potassium 4.4 mmol/l (3.5-5)

Creatinine 92 micromol/l (79-118)

Lumbar puncture - lymphocytosis, slightly raised protein, normal glucose.

Which of the following is the most likely diagnosis?

- 1- Cytomegalovirus meningitis
- 2- Enterovirus meningitis
- 3- Herpes simplex encephalitis
- 4- Meningococcal meningitis
- 5- Subarachnoid haemorrhage

Answer & Comments

Answer: 2- Enterovirus meningitis

The answer is option B, Enterovirus meningitis.

Enterovirus is the commonest cause of viral meningitis in the adult population. The coryzal symptoms coupled with a mild diarrhoeal illness fit with this picture, as do the lumbar puncture findings.

Management of viral meningitis is conservative, with adequate hydration and analgesia.



[Q: 4350] OnExamination 2012 - Medicine

A 36-year-old single woman with a history of asthma comes to the clinic complaining of symptoms of indigestion. She uses a steroid inhaler and on examination of her oropharynx you can see obvious evidence of candidiasis. You send her for an endoscopy, which unfortunately reveals extensive oesophageal candidiasis.

Which of the following tests would be most important to consider in this patient?

- 1- CD4 count
- 2- Complement testing
- 3- Fasting blood glucose
- 4- HIV antibody testing

5- Immunoglobulin testing

Answer & Comments

Answer: 4- HIV antibody testing

The answer is D, HIV antibody testing.

Whilst candidiasis affecting the oropharynx may be a result of poor inhaler technique and deposition of steroid powder within the mouth, it does not usually result in oesophageal candidiasis.

The other possible cause of recurrent oral and genital candida infection is diabetes mellitus, although again this would not normally lead to oesophageal disease.

In the case of this patient, immunocompromise should be suspected and HIV considered, with appropriate pre-test counselling.



[Q: 4351] OnExamination 2012 - Medicine

A 52-year-old man has a history of hypertension, managed with amlodipine and indapamide. His GP recently tried to commence ramipril, but had to curtail this as his creatinine rose from 129 to 194 after one week of therapy.

He smokes 20 cigarettes per day and is a vasculopath having suffered a transient ischaemic attack (TIA) one year earlier.

On examination in the clinic his BP is 155/92 mmHg, pulse is regular at 80 and a left carotid bruit is audible.

Investigations show:

Haemoglobin 12.0 g/dl(13.5-17.7)

White cell count $6.0 \times 10^9/L$ (4-11)

Platelets $288 \times 10^9/L$ (150-400)

Serum sodium 140 mmol/l (135-146)

Serum potassium 4.0 mmol/l (3.5-5)

Creatinine 122 $\mu\text{mol/l}$ (79-118)

Ultrasound scan: Right kidney smaller than the left

Renal MRA: Suggestive of 80% right renal artery stenosis

Which of the following is the most appropriate next step in his management?

- 1- Add bisoprolol to his anti-hypertensive regimen
- 2- Re-introduce low dose ramipril to his regimen
- 3- Refer for urgent angioplasty and stenting
- 4- Refer for vascular surgery
- 5- Trial valsartan as an alternative to ACE inhibition

Answer & Comments

Answer: 1- Add bisoprolol to his anti-hypertensive regimen

There is considerable debate about the success of angioplasty/stenting or vascular surgery in patients with atherosclerotic renal artery stenosis and difficult to manage hypertension. The most recent study by Bax et al showed no difference in outcomes between those patients managed with medical therapy versus stenting.

Other studies suggest that complications of stenting or angioplasty outweigh any benefits versus medical therapy.

There is no evidence to support re-introducing ACE inhibition or substituting an angiotensin receptor blocker (ARB) with respect to potential outcomes. As such, in the first instance, response to increased medical therapy for blood pressure should be assessed.

Reference:

Bax L, Woittiez AJ, Kouwenberg HJ et al. (2009) Stent placement in patients with atherosclerotic renal artery stenosis and impaired renal function: a randomized trial. *Ann Intern Med.* 150(12): 840-848



[Q: 4352] OnExamination 2012 - Medicine

An 86-year-old lady is admitted with parkinsonism.

Exposure to which of the following drugs is the most likely cause?

- 1- Buprenorphine
- 2- Cyclizine
- 3- Metoclopramide
- 4- Phenytoin
- 5- Trimethoprim

Answer & Comments

Answer: 3- Metoclopramide

Metoclopramide is a dopamine receptor antagonist that can induce parkinsonism. It can also worsen control in patients with idiopathic Parkinson's disease to its antagonistic effect on dopamine receptors.

Answer A is incorrect because buprenorphine is an opioid agonist and does not cause parkinsonism.

Answer B should not be selected, because it is very rare for cyclizine to induce parkinsonism. Cyclizine is a histamine receptor antagonist.

Of the options given, metoclopramide is far more likely to cause extrapyramidal side effects.

Answer D should not be selected because there have been only two case reports of phenytoin-induced parkinsonism that resolved after discontinuation of phenytoin.

The most likely cause is metoclopramide (option C).

Answer E is incorrect because trimethoprim does not cause extrapyramidal side effects.



[Q: 4353] OnExamination 2012 - Medicine

A 17-year-old girl, who works at a petting zoo, presents with a headache and vomiting to the emergency department. Apparently she suffered a severe diarrhoeal illness which began a few days ago, and she is now passing diarrhoea mixed with blood and mucus.

She has no past history of note, and her only medication is the oral contraceptive pill.

On examination she looks unwell, her BP is 155/92 mmHg and she is pyrexial at 38.2°C. Her abdomen is soft and diffusely tender with very active bowel sounds.

Investigations reveal:

Haemoglobin 10.0 g/dl(11.5-16.5)

White cell count $11.6 \times 10^9/L$ (4-11)

Platelets $50 \times 10^9/L$ (150-400)

Serum Sodium 139 mmol/l (135-146)

Serum potassium 6.0 mmol/l (3.5-5)

Creatinine 295 $\mu\text{mol/l}$ (79-118)

What do expect to find on the blood film?

- 1- Decreased reticulocytes
- 2- Increased lymphocytes
- 3- Increased ghost cells
- 4- Increased schistocytes
- 5- Increased spherocytes

Answer & Comments

Answer: 4- Increased schistocytes

This patient has a history consistent with Escherichia coli 157 infection, and a picture of haemolytic uraemic syndrome (HUS).

The hallmark of HUS is the appearance of schistocytes (fragmented, deformed, irregular, or helmet shaped red cells) on the blood film. Despite the low platelet count, petechiae and purpura are rarely seen, although GI bleeding is often noted.

Treatment is generally supportive. Non-steroidal anti-inflammatory drugs and anti-diarrhoeals should be avoided, and there is no evidence for the use of antibiotics in the condition.



[Q: 4354] OnExamination 2012 - Medicine

A 55-year-old gentleman is suffering with erectile dysfunction.

He has a past medical history of type 2 diabetes and angina.

Which of the following medications would be a contraindication to prescribing sildenafil?

- 1- Clopidogrel
- 2- GTN spray used once per month
- 3- Metoprolol
- 4- Nicorandil
- 5- Propranolol

Answer & Comments

Answer: 4- Nicorandil

The phosphodiesterase 5 inhibitors should be avoided in patients taking nitrates or nicorandil. This is due to vasodilatation potentially causing hypotension and precipitating a myocardial event.

The gentleman using a GTN spray less than once per week could be prescribed sildenafil, although it is worth warning him that should he have chest pain requiring the Emergency department after having taken sildenafil, he should warn his health care providers so that they can avoid nitrates whilst treating his symptoms.

Myocardial infarction is a contraindication to the use of sildenafil; however cardiovascular disease (that is, angina) requires cautious prescribing.

Other patients in which PDE5 inhibitors should be used with caution are those with risk of

priapism, such as sickle cell or multiple myeloma.

None of the other drugs, aspirin, clopidogrel, ACE inhibitors and beta blockers are contraindications to the use of sildenafil.



[Q: 4355] OnExamination 2012 - Medicine

You perform a renal function test on a 25-year-old man and an 83-year-old lady.

Both of them have a creatinine level of 90 mmol/l. You note, however, that the estimated glomerular filtration rate (eGFR) for the young man is 95 ml/min/1.73m² and that the eGFR for the elderly lady is 55 ml/min/1.73m².

Which of the following is the most likely explanation?

- 1- Age related change to the medullary vasculature
- 2- Age related muscle loss in the elderly lady
- 3- Increased glomerular filtration rate in the young man
- 4- Increased muscle mass in the young man
- 5- Reduced blood flow in the afferent arterioles of the cortex in the elderly lady

Answer & Comments

Answer: 2- Age related muscle loss in the elderly lady

Answer B is correct because there is a decline in glomerular filtration rate and plasma flow rate associated with age.

The creatinine level in the plasma does not increase because there is age related muscle loss. A 'normal' creatinine in an elderly patient is thus not indicative of normal renal function and is a poor marker to establish whether an elderly patient has renal impairment. It is much more accurate to use estimated glomerular filtration rate (eGFR).

Answer A is incorrect because there is no change to medullary vasculature associated with ageing.

Answer C is incorrect because this man has a normal glomerular filtration rate.

Answer D is incorrect because if there was increased muscle mass in the young man the creatinine level could be normal or even high. This would however not explain why the elderly lady has a lower eGFR and 'normal' creatinine.

Answer E should not be selected because although there is reduced blood flow in the afferent arterioles of the cortex associated with ageing, this would not explain the relatively 'normal' level of creatinine in the elderly lady.



[Q: 4356] OnExamination 2012 - Medicine

An 88-year-old woman is admitted with swollen legs and increased abdominal swelling. She is commenced on intravenous furosemide and responds well.

You note that she has been on oral furosemide at home.

Which of the following best explains the reason for the response to intravenous drugs?

- 1- Decreased protein binding of furosemide
- 2- Increased bioavailability
- 3- Increased effect on the loop of Henle
- 4- Increased first pass metabolism
- 5- Increased plasma volume

Answer & Comments

Answer: 2- Increased bioavailability

Answer B is correct. This lady has a lot of gut oedema secondary to right heart failure which would reduce the absorption of oral furosemide. Intravenous furosemide would

have a much better bioavailability and thus therapeutic effect.

Answer A is not correct. Protein binding of drugs may be reduced in elderly patients. This may be due to malnutrition. In this case scenario, however, furosemide is poorly absorbed from the gut.

Answer C should not be selected. Intravenous furosemide would have a more pronounced effect on the loop of Henle due to increased bioavailability of the drug when given intravenously due to poor absorption secondary to gut oedema as stated above.

Answer D should not be selected. Furosemide undergoes about 40% first pass metabolism in the gut and the kidney. First pass metabolism may be reduced as a result of liver congestion.

Answer E should not be selected because the increased plasma volume is likely secondary to heart failure itself.



[Q: 4357] OnExamination 2012 - Medicine

An 86-year-old man sees you in clinic.

He is a keen marathon runner and tells you that he gets breathless much earlier on in a race than he did 10 years ago.

Which physiological change associated with age would be the most likely cause for his symptoms?

- 1- Diastolic dysfunction and reduced stroke volume
- 2- Higher systolic arterial pressure and increased impedance to left ventricular ejection
- 3- Increased sino-atrial conduction time
- 4- Left ventricular hypertrophy
- 5- Reduced tachycardic response

Answer & Comments

Answer: 5- Reduced tachycardic response

Answer E is correct. There is a reduced tachycardic response during exercise associated with age. The heart has to compensate by increasing stroke volume and failure to do so will reduce aerobic capacity. Some fit, healthy elderly men can compensate for this by increasing left ventricular filling and thus stroke volume (Starling's law).

Answers A,B, C and D are all physiological changes associated with age. They occur, irrespective of whether a patient exercises or not.

The symptoms that this patient describes are during exercise and failure of the heart to respond appropriately to exercise by increasing the heart rate will lead to dyspnoea.



[Q: 4358] OnExamination 2012 - Medicine

A 68-year-old man with a 45/year pack history is referred by his GP to the respiratory clinic with increasing breathlessness over the last 12 months.

He has a cough productive of clear sputum, which appears to be present most days. He has no weight loss and no history of haemoptysis.

His spirometry results show FEV₁/FVC 0.65 and FEV₁ (% predicted) 71%.

Based on the latest NICE guidelines, what (if any) is the severity of this man's airflow obstruction?

- 1- Mild
- 2- Moderate
- 3- No airflow obstruction
- 4- Severe
- 5- Very severe

Answer & Comments

Answer: 2- Moderate

NICE have recently (2010) produced a clinical guideline as a tool to assess airflow obstruction.

There have been some alterations to the previous classification of airflow obstruction, based on other the American Thoracic Society, GOLD and European Respiratory Society standards.

Below are the new classifications:

Mild - FEV₁ predicted greater than 80%

Moderate - FEV₁ predicted 50-79%

Severe - FEV₁ predicted 30-49%

Very severe - FEV₁ predicted less than 30%.

NICE guidelines



[Q: 4359] OnExamination 2012 - Medicine

A 31-year-old motorcyclist becomes confused and dyspnoeic on the orthopaedic ward, 24 hours after fracturing his right femur in an accident.

Which of the following skin lesions may be found on examination?

- 1- Multiple petechiae in both axilla
- 2- Palpable purpura on buttocks and legs
- 3- Target lesions on his chest
- 4- Tender red nodules on his shins
- 5- Vesicular lesions on his torso

Answer & Comments

Answer: 1- Multiple petechiae in both axilla

The appearance of multiple petechiae in the distribution of the axilla or upper body is characteristic of a fat embolism.

Unlike emboli that arise from a thrombus, fat emboli are small and multiple producing widespread effects. They may occur one to three days following a fracture and are more

common in closed fractures on the long bones or pelvis.

The clinical features of fat emboli are predominately

Pulmonary (shortness of breath, hypoxia)

Neurological (confusion and agitation)

Dermatological (petechiae) and

Haematological (thrombocytopenia, anaemia).

The petechial rash is pathognomonic of this syndrome, but occurs in only 30-50% of cases.



[Q: 4360] OnExamination 2012 - Medicine

A 18-year-old student presents to the student health service with frank haematuria that began some 48 hours after an upper respiratory tract infection.

On examination he is afebrile, BP is 110/72 mmHg and pulse is 70. His chest is clear and his abdomen is soft and non-tender.

Investigations reveal:

Haemoglobin 14.0 g/dl (13.5-17.7)

White cell count $8.0 \times 10^9/L$ (4-11)

Platelets $248 \times 10^9/L$ (150-400)

Serum sodium 138 mmol/l (135-146)

Serum potassium 4.3 mmol/l (3.5-5)

Creatinine 85 $\mu\text{mol/l}$ (79-118)

Urine blood +++

Which of the following is the most appropriate way to manage him?

- 1- ACE inhibitor titrated to maximal tolerated dose
- 2- ACE inhibitor titrated to maximal tolerated dose and ARB in combination
- 3- Methylprednisolone and cyclophosphamide
- 4- Observation
- 5- Prednisolone 60 mg/day

Answer & Comments

Answer: 4- Observation

This patient almost certainly has IgA nephropathy, given his presentation with frank haematuria occurring in such close proximity to a recent upper respiratory tract infection.

The findings including normal blood pressure, normal creatinine and haematuria without proteinuria point towards a benign prognosis and for this reason he only requires regular monitoring rather than intervention with immunosuppressive agents.

Treatment with corticosteroids is usually reserved for those patients with hypertension and a rising creatinine.

Where there is significant hypertension +/- proteinuria, then ACE inhibitors are the first choice antihypertensive agent.

Post-streptococcus glomerulonephritis usually occurs one to three weeks after initial infection.



[Q: 4361] OnExamination 2012 - Medicine

A 49-year-old woman comes to the clinic complaining of rapidly worsening lethargy and nausea. Over the past few days she has become increasingly unwell and is now barely able to get out of the house.

Other symptoms of note include progressive shortness of breath and a cough productive of blood stained sputum. Her only consultations with the doctor over the past six months have been about the shape of her nose; she has suffered some collapse of her nasal bridge and is considering plastic surgery.

On examination you notice collapse of the bridge of her nose, and nasal congestion when she speaks. Her BP is elevated at 155/95 mmHg. You can hear crepitations on auscultation of the chest.

Investigations show:

Haemoglobin 12.0 g/dl(11.5-16.5)

White cell count $11.6 \times 10^9/L$ (4-11)

Platelets $202 \times 10^9/L$ (150-400)

Serum Sodium 139 mmol/l (135-146)

Serum Potassium 5.8 mmol/l (3.5-5)

Creatinine 285 micromol/l (79-118)

CXR Patchy interstitial shadowing

C-ANCA Positive

Which of the following is the most appropriate treatment?

- 1- Infliximab
- 2- Methylprednisolone and azathioprine
- 3- Methylprednisolone and cyclophosphamide
- 4- Methylprednisolone and methotrexate
- 5- Prednisolone

Answer & Comments

Answer: 3- Methylprednisolone and cyclophosphamide

Methylprednisolone and cyclophosphamide is the treatment of choice for induction of remission in Wegener's granulomatosis, the obvious diagnosis here.

Evidence from controlled trials suggests that once remission is achieved azathioprine or methotrexate may be reasonable alternatives to cyclophosphamide.

In refractory Wegener's, both infliximab and rituximab have shown some degree of promise.

Prognosis is dependent on prompt diagnosis and early intervention with immunosuppressive therapies, with evidence suggesting that time to diagnosis has shortened over the past few years.



[Q: 4362] OnExamination 2012 - Medicine

A 67-year-old man with chronic renal failure, who uses peritoneal dialysis, presents to the renal ward with a cloudy bag. This is his first episode of continuous ambulatory peritoneal dialysis (CAPD) peritonitis in over two years of dialysing.

He has type 1 diabetes, which precipitated his renal impairment. On examination, he is pyrexial at 38.2°C. His abdomen is diffusely tender, although he has bowel sounds on auscultation.

Investigations showed:

Haemoglobin 10.2 g/dl(13.5-17.7)

White cell count $13.6 \times 10^9/L$ (4-11)

Platelets $270 \times 10^9/L$ (150-400)

Serum Sodium 138 mmol/l (135-146)

Serum Potassium 4.3 mmol/l (3.5-5)

Creatinine 346 $\mu\text{mol/l}$ (79-118)

Dialysis fluid >100 white cells per mm³

Which of the following is the most likely infecting organism?

- 1- B. fragilis
- 2- Bacteroides spp
- 3- P. aeruginosa
- 4- S. aureus
- 5- S. pyogenes

Answer & Comments

Answer: 4- S. aureus

S. aureus and S. epidermidis are the two commonest pathogens identified in cases of CAPD peritonitis.

Various treatment regimes exist, but the majority involve intraperitoneal vancomycin and an oral quinolone. Once culture results are received, the regime can then be tailored appropriately.

The key to avoiding long term complications of CAPD peritonitis is prompt intervention to avoid chronic colonisation of the CAPD catheter and adhesion formation, which prevents adequate fluid exchange.



[Q: 4363] OnExamination 2012 - Medicine

A student from the Indian subcontinent has recently been diagnosed with sputum positive tuberculosis (TB).

He lives on the university campus in a shared flat. His housemates are contacted by public health and requested to undergo screening.

Which of the following investigations is most commonly used in this instance?

- 1- Blood test
- 2- Chest x ray
- 3- Heaf test
- 4- Mantoux test
- 5- Microbiology (sputum)

Answer & Comments

Answer: 4- Mantoux test

The Mantoux test is the most commonly used screening test for contacts of a patient with recently diagnosed TB. If this suggests a risk of infection, then a chest x ray is performed and appropriate follow up arranged.

Heaf tests are now less commonly used as a screening test.

Blood tests may indicate anaemia, hyponatraemia or hypercalcaemia, which are sometimes seen in infection, but would not have a role in screening.

Microbiology - assessing either sputum or bronchial washings for acid-fast bacilli - would not be routinely used in asymptomatic contacts.



[Q: 4364] OnExamination 2012 - Medicine

A 60-year-old Asian man who has lived in the United Kingdom for the past 15 years presents with painless haematuria. He is otherwise well. He is a smoker of 10 cigarettes per day.

Investigations reveal a haemoglobin of 11 g/dl (13-18g/dl). His WBC, ESR, CRP, LFTs, Urea and electrolytes are normal. Urinalysis shows ++ blood and a PA chest x-ray shows small flecks of white opacifications in the upper lobe of the left lung.

What is the most likely diagnosis?

- 1- Bladder carcinoma
- 2- Glomerular disease
- 3- Prostatic carcinoma
- 4- Renal calculi
- 5- Tuberculosis

Answer & Comments

Answer: 1- Bladder carcinoma

The presence of painless haematuria in a male smoker should lead you to consider bladder carcinoma as a diagnosis. The majority of these tumours are transitional cell carcinomas, although they can be squamous carcinomas (associated with a worse prognosis). The usual presentation is with bleeding or urinary tract obstruction (more common with lesions of the renal pelvis and ureter). Several carcinogens including smoking, rubber and analine dye exposure and analgesic nephropathy have been linked with bladder carcinoma. Other risk factors include renal calculi, cystic renal disease, chronic cystitis, Schistosoma haematobium and cyclophosphamide. Treatment is with surgery and radiotherapy, which results in a 5-year survival rate of 50%.

The patient's ethnicity and the chest x ray findings are suggestive of previous TB infection. TB can also affect the urinary tract,

but if that were the diagnosis her you would also expect him to complain of malaise, sweats, weight loss or symptoms of UTI.

Glomerular disease typically results in deranged renal function, and there is often also proteinuria. Prostatic carcinoma usually causes symptoms of urinary tract obstruction prior to haematuria. Renal calculi are painful.



[Q: 4365] OnExamination 2012 - Medicine

A patient was diagnosed with TB and had been on treatment for two months.

He was lost to follow up. Four months later he presented with haemoptysis and fatigue. On examination his temperature was 38.2°. Sputum analysis for acid fast bacilli was positive.

The patient is suspected of having multiple drug resistant tuberculosis (MDR TB).

Which of the following would be the strongest risk factor for MDR TB?

- 1- Age 12-20 years
- 2- Female gender
- 3- Herpes simplex virus
- 4- HIV
- 5- Resident in Manchester

Answer & Comments

Answer: 4- HIV

The risk factors for MDR TB are

History of prior TB drug treatment; prior TB treatment failure

Contact with a known case of drug-resistant TB

Birth in a foreign country, particularly high-incidence countries

HIV infection

Residence in London

Age profile, with highest rates between ages 25 and 44

Male gender.

(NICE guidance CG117)



[Q: 4366] OnExamination 2012 - Medicine

A 47-year-old patient has daytime sleepiness. He wakes up in the morning un-refreshed. He frequently dozes off while watching TV.

He is hypertensive but well controlled with amlodipine 5 mg and ramipril 2.5 mg. He occasionally takes paracetamol for back pain. Neurological examination was normal. His BMI is 45.

He was referred for suspicion of obstructive sleep apnoea (OSA).

Which of the following tests would you request to confirm diagnosis?

- 1- CT chest
- 2- Echocardiogram
- 3- Multiple sleep latency test
- 4- Polysomnography
- 5- Thyroid function tests

Answer & Comments

Answer: 4- Polysomnography

It is important to be aware of the diagnostic tests for various respiratory problems.

Polysomnography or sleep studies will reveal periods of apnoea during sleep.

Hypothyroidism can be associated with OSA but is not diagnostic.

CT chest and echo are not helpful in making the diagnosis.



[Q: 4367] OnExamination 2012 -
Medicine

A 32-year-old man presents with fever, shortness of breath and productive cough for five weeks.

Prior to that he was fit and well with no respiratory complaints. His only medical history is that he frequently visits his dentist for teeth problems and has been a heavy drinker for a long time.

Three weeks ago he was given antibiotics by his GP with slight improvement but then got worse.

What is the most likely diagnosis?

- 1- Asthma precipitated by pneumonia
- 2- Bronchiectasis
- 3- Empyema
- 4- Lung abscess
- 5- Pulmonary embolism (PE)

Answer & Comments

Answer: 4- Lung abscess

Predisposing factors for lung abscess include dental disease, impaired consciousness, for example, alcohol, post-anaesthesia, bronchial carcinoma and immunosuppression.

Empyema usually does not cause productive cough.

PE is unlikely in this scenario as well as asthma.

Bronchiectasis is a chronic condition and usually there is underlying cause.



[Q: 4368] OnExamination 2012 -
Medicine

An 84-year-old lady is treated for a chest infection in hospital.

On admission her creatinine kinase (CK) level was normal. Three days later she is found to

be in renal failure and has a CK of 8000 mmol/l.

She is taking simvastatin, aspirin, bisoprolol and St John's wort.

Which of the following drugs would be the most likely cause?

- 1- Ciprofloxacin
- 2- Clarithromycin
- 3- Co-amoxiclav
- 4- Doxycycline
- 5- Metronidazole

Answer & Comments

Answer: 2- Clarithromycin

Answer B is correct because there is a significant drug interaction between clarithromycin and simvastatin.

Clarithromycin strongly inhibits CYP3A4 - the enzyme responsible for simvastatin metabolism which can lead to rhabdomyolysis and renal failure.

Macrolide antibiotics and hydroxymethylglutaryl coenzyme A (HMG-CoA) reductase inhibitors should never be administered together.

Answer A should not be selected. There can be a very rare interaction between ciprofloxacin and simvastatin that can give rise to rhabdomyolysis. The question, however, states the 'most likely' cause for the presentation and that would certainly be answer B.

Answer C is incorrect because it does not inhibit CYP4A4 and does not have a significant interaction with statins.

Answer D should not be selected, because there is no interaction between doxycycline and simvastatin.

Answer E should not be selected. There is a moderate interaction that exists between

simvastatin and metronidazole and patients should be closely monitored for symptoms of peripheral neuropathy.



[Q: 4369] OnExamination 2012 - Medicine

An 82-year-old lady presents with a fall and a Colles' fracture.

She is commenced on alendronate.

Which of the following is the mechanism of the therapeutic effect of this drug?

- 1- Decreasing the effect of endogenous parathyroid hormone
- 2- Improved calcium absorption from the kidney
- 3- Inhibition of osteoblast activity
- 4- Inhibition of osteoclast activity
- 5- Stimulation of osteoblast activity

Answer & Comments

Answer: 4- Inhibition of osteoclast activity

Answer D is correct because alendronate inhibits osteoclast activity and this prevents the breakdown of bone and thus bone loss.

Answers A and B are incorrect because bisphosphonates do not exhibit these therapeutic effects.

Answers C and E are incorrect because alendronate's therapeutic effect is not associated with change in osteoblast activity.



[Q: 4370] OnExamination 2012 - Medicine

A 65-year-old man has recently been diagnosed with non-small cell lung cancer. His management plan is discussed at the regional multi-disciplinary meeting.

Which of the following would not preclude him from being offered surgery?

- 1- FEV₁ 0.4L

- 2- Malignant pleural effusion
- 3- Mediastinal lymphadenopathy
- 4- Sclerotic vertebral lesion on x ray
- 5- Tumour size of 3 cm

Answer & Comments

Answer: 5- Tumour size of 3 cm

A tumour size of greater than 3 cm (providing there is no lymphadenopathy or evidence of distant spread) may still be amenable to surgery as it may fall within stages IB and IIB.

Answers B to D indicate metastatic spread of the disease, and as such surgery would be inappropriate.

A FEV₁ of less than 0.5 is also a contraindication for surgical management.



[Q: 4371] OnExamination 2012 - Medicine

A 50-year-old man is admitted to the hospital with a third attack of renal stones in the last six months.

He suffers from Crohn's disease and has previously had a limited small bowel resection, but his disease is now quiescent. Apparently there is a history of high calcium levels in other blood relatives.

On examination his BP is 115/72 mmHg, his BMI is 19.5, he has a midline scar consistent with a previous laparotomy.

Investigations show:

Haemoglobin 12.0 g/dl (11.5-16.5)

White cell count 6.4 x 10⁹/L (4-11)

Platelets 272 x 10⁹/L (150-400)

Serum Sodium 138 mmol/l (135-146)

Serum Potassium 4.1 mmol/l (3.5-5)

Creatinine 85 µmol/l (79-118)

Calcium 2.89 mmol/l (2.20-2.67)

PTH Upper limit of normal range

Which of the following is the most likely diagnosis?

- 1- Familial hypocalciuric hypercalcaemia
- 2- Primary hyperparathyroidism
- 3- PTHrP levels increased due to underlying malignancy
- 4- Secondary hyperparathyroidism
- 5- Tertiary hyperparathyroidism

Answer & Comments

Answer: 1- Familial hypocalciuric hypercalcaemia

Plasma calcium is tightly regulated by parathyroid hormone (PTH) and vitamin D, which act on the gastrointestinal tract, kidney and bone. PTH releases calcium from bone, and inhibits its excretion from the kidney. Vitamin D promotes calcium absorption from the gastrointestinal tract. Plasma calcium levels are detected by a calcium-sensing receptor on the parathyroid glands.

This gentleman has a raised calcium with an inappropriately high PTH. The remainder of his bloods are normal, with no evidence of renal failure or malabsorption.

Familial hypocalciuric hypercalcaemia is an autosomal dominant condition and is the most likely diagnosis in this case.

The disease most often leads to asymptomatic elevated levels of serum calcium, although some patients with the condition may suffer recurrent episodes of renal stones.

The inherited condition is usually caused by a mutation in the calcium-sensing receptor gene. The perceived lack of calcium levels by the parathyroid leads to resetting of calcium and PTH to higher levels. It does not require any treatment.

Primary hyperparathyroidism is caused by parathyroid adenomas or hyperplasia, which results in raised PTH and subsequently raised

plasma and urinary calcium. Alkaline phosphatase is raised, and serum phosphate is reduced.

Secondary hyperparathyroidism is compensatory hypertrophy of all four glands due to hypocalcaemia (due to chronic kidney disease, or malabsorption). PTH is raised and calcium is low or normal.

Tertiary hyperparathyroidism develops after a prolonged period of secondary hyperparathyroidism. The parathyroid glands become autonomous and both PTH and calcium are raised.

PTH-related protein is responsible for 80% of hypercalcaemia in malignancy, and acts on the same receptors as PTH. It is secreted by squamous cell tumours, breast and renal tumours. Serum calcium is raised, but PTH will be low.



[Q: 4372] OnExamination 2012 - Medicine

A 14-year-old boy presents with a high fever, cervical lymphadenopathy, and pus on the tonsils.

Which of the following statements regarding diagnosis and management is true?

- 1- Amoxicillin may cause an erythematous rash
- 2- Cefotaxime is the treatment of choice
- 3- If his CRP is 40, then Group A streptococcal infection is highly likely
- 4- If urinary red cells are present, then a renal biopsy is indicated
- 5- Tonsillectomy is indicated after the acute infection has settled

Answer & Comments

Answer: 1- Amoxicillin may cause an erythematous rash

Epstein-Barr virus is a common problem in paediatrics, general practice and medical admissions, and unfortunately on clinical appearances it is not possible to distinguish bacterial from viral or throat infections with any degree of reliability.

Urinary red cells may indicate a secondary post-streptococcal glomerulonephritis, but a renal biopsy is unlikely to be indicated.

A Group A streptococcal infection should certainly be considered in this case, and probably covered with oral penicillin-v, but reliable clinical diagnosis is not possible.

If the child has Epstein-Barr virus infection, then the administration of amoxicillin will give an erythematous rash. Non-vomiting patients can be treated with oral penicillin-v.

Cefotaxime, although it would probably be effective, requires IV administrations which does not seem warranted on the information given.

Tonsillectomy should be reserved for those with recurrent tonsillitis not responding to prophylactic antibiotics.



[Q: 4373] OnExamination 2012 - Medicine

A 79-year-old male with critical ischaemia of his foot is awaiting below knee amputation and has lower limb pain.

He is awake and lucid with normal observations.

His full blood count shows:

Haemoglobin 12.0 g/dl(13.0-18.0)

White cell count $14.0 \times 10^9/L$ (4-11)

Platelets $67 \times 10^9/L$ (150-400)

Which of the following is the best option for pain relief?

- 1- Diclofenac 50 mg per oram
- 2- Epidural analgesia
- 3- Femoral nerve block

4- Morphine 10 mg intravenously

5- Tramadol 50 mg per oram

Answer & Comments

Answer: 5- Tramadol 50 mg per oram

Of the options given, tramadol is the best.

In a 79-year-old arteriopath diclofenac is best avoided for fear of renal damage.

Epidural analgesia may confer benefits, especially pre-operatively for below knee amputation, however with platelets of 67 most operators would be reticent to site one.

Femoral nerve block is a relatively simple procedure which may help, but will give incomplete cover and runs the risk of damaging the femoral artery.

10 mg morphine intravenously would be considered hazardous in a 79-year-old (in most people actually).

Tramadol can have unpleasant side effects for the elderly.



[Q: 4374] OnExamination 2012 - Medicine

A 26-year-old patient with known AIDS presents with a history of increasing breathlessness and dry cough. He is investigated by the respiratory team and diagnosed with pneumocystis pneumonia (PCP).

Which of the following features is most accurate regarding PCP?

- 1- Amphotericin is the treatment of choice
- 2- Blood cultures are positive in 1/3rd of cases
- 3- Occurs only in AIDS
- 4- Pleural effusions are most often bilateral
- 5- The lungs are commonly clear on auscultation

Answer & Comments

Answer: 5- The lungs are commonly clear on auscultation

Patients with pneumocystis pneumonia often present with signs and symptoms of respiratory distress, although on examination of the chest there is often no abnormality detected.

Although initially reported as a disease associated with AIDS, PCP can affect any immunocompromised patient including transplant patients.

The trophozoite does not enter the blood stream, and the organism is usually identified in pulmonary secretions.

Co-trimoxazole (Septrin) or pentamidine are the treatments of choice.



[Q: 4375] OnExamination 2012 - Medicine

A 27-year-old lady presents with generalised oedema of five months duration.

Investigations reveal proteinuria (5.5 g/day), hypoproteinaemia and hypercholesterolaemia, urea 10 mmol/L (2.5-7.5) and creatinine 200 mol/L (60-110). Renal biopsy confirms membranous glomerulonephritis.

What will be the most appropriate management to get remission?

- 1- Azathiaprine
- 2- Cyclophosphamide plus methylprednisolone
- 3- Cyclosporin A
- 4- Methylprednisolone
- 5- Protein restriction

Answer & Comments

Answer: 2- Cyclophosphamide plus methylprednisolone

The twin aims of treating membranous nephropathy are

First to induce a remission of the nephrotic syndrome and

Second to prevent the development of end stage renal failure.

A meta-analysis of four randomised controlled studies comparing treatments of membranous nephropathy showed that regimes comprising chlorambucil or cyclophosphamide, either alone or with steroids, were more effective than symptomatic treatment or treatment with steroids alone in inducing remission of the nephrotic syndrome.

A small randomised controlled study of 17 patients with a persistent nephrotic syndrome and declining renal function suggested that ciclosporin A slowed the rate of decline of renal function: this requires confirmation in a larger trial.



[Q: 4376] OnExamination 2012 - Medicine

A 27-year-old patient presented to his GP with persistent cough and weight loss. He had night sweats.

He was diagnosed with TB and referred to the respiratory clinic. He was started on treatment. His urine became orange in colour.

Which one of the following drugs causes this?

- 1- Ciprofloxacin
- 2- Ethambutol
- 3- Isoniazide
- 4- Pyrazinamide
- 5- Rifampicin

Answer & Comments

Answer: 5- Rifampicin

It is very important to be aware of side effects of drugs especially those for TB.

Patients should be warned about this. It can also be used to confirm compliance.

Orange staining occurs to contact lenses.



[Q: 4377] OnExamination 2012 - Medicine

A 32-year-old woman presented with daytime sleepiness and fatigue.

She does not take any regular medications. She denies snoring at night. On detailed history, she describes having episodes of probable cataplexy.

Clinical examination is unremarkable. Thyroid function tests are normal.

The patient is suspected of having narcolepsy.

Which of the following tests will be most useful in diagnosis?

- 1- Genetic analysis
- 2- High hypocretin levels in cerebrospinal fluid (CSF) analysis
- 3- Multiple sleep latency test
- 4- Polysomnography
- 5- Trial of continuous positive airway pressure (CPAP)

Answer & Comments

Answer: 3- Multiple sleep latency test

Cataplexy is an important feature of narcolepsy. There is lower than normal hypocretin levels in CSF. There is high rate of HLA-DBQ1*0602 but this is not diagnostic.

Polysomnography can sometimes be done to exclude obstructive sleep apnoea (OSA) but will not diagnose narcolepsy.

Nasal CPAP is used in treatment of OSA and not used for narcolepsy.



[Q: 4378] OnExamination 2012 - Medicine

A 79-year-old man presents with an ischaemic

stroke and a left hemiparesis.

According to the WHO International Classification of Functioning, Disability and Health, what would be the classification of the left hemiparesis with which he presents?

- 1- Activity limitation
- 2- Impairment of body function
- 3- Participation restriction
- 4- Pathology
- 5- Right total anterior circulation infarct

Answer & Comments

Answer: 2- Impairment of body function

The NICE guidelines on stroke suggest that we use terminology to describe the type of impairment in accordance with the WHO International Classification of Functioning, Disability and Health. Symptoms and signs are classified as 'impairment of body function'.

Answer A is incorrect because the type of impairment classified as 'activity limitation' are difficulties that a patient may have in executing certain activities, for example communication impairment in patients with aphasia following a stroke or the inability to pick up a cup in the affected hand.

Answer C is incorrect because the type of impairment classified as 'participation restriction' are problems a patient may have in social roles - for example as a spouse or parent.

Answer D is incorrect because the type of impairment classified as 'pathology' would be the diagnosis/disease.

Answer E is incorrect as the answer relates to the Oxford Bamford classification for stroke.



[Q: 4379] OnExamination 2012 - Medicine

An 84-year-old lady is admitted to a rehabilitation unit following a stroke.

On admission a Barthel index is performed.

Which of the following best describes the limitations of using the Barthel index in rehabilitation?

- 1- Floor and ceiling effects
- 2- It correlates poorly with other prognostic scales
- 3- It has poor concurrent and predictive validity
- 4- It is not very sensitive
- 5- It is laborious and takes a long time to perform

Answer & Comments

Answer: 1- Floor and ceiling effects

The most widely recognised limitation of the Barthel index is floor and ceiling effects. It basically means that a disabled person can score a maximum score of 100 and still not be independent.

It is poor at differentiating disability in patients who function at a higher level. It also has floor effects as it may incorrectly score patients low who are initially bed bound following a stroke.

Answer B is incorrect because it correlates well with other prognostic scales.

Answer C is incorrect because it has very good concurrent and predictive validity.

Answer D is incorrect because it is very sensitive.

Answer E is incorrect because it only takes 10 minutes to perform.



[Q: 4380] OnExamination 2012 - Medicine

A 72-year-old ex-miner with a significant smoking history and proven diagnosis of COPD is attending chest clinic for review.

He currently takes only a short acting beta agonist (salbutamol). His last FEV₁ was 45%. He feels his symptoms are not currently controlled on his current drug regime.

According to the latest guidelines, what changes should be made to his medication?

- 1- Inhaled corticosteroid (ICS)
- 2- Long acting beta agonist (LABA)
- 3- Long acting beta agonist and inhaled corticosteroid
- 4- Long acting beta agonist and inhaled corticosteroid and long acting muscarinic antagonist
- 5- Long acting muscarinic antagonist (LAMA) and long acting beta agonist

Answer & Comments

Answer: 3- Long acting beta agonist and inhaled corticosteroid

NICE have recently published guidelines for the management of chronic obstructive pulmonary disease (COPD).

Initially a short acting beta agonist or a short acting muscarinic antagonist (LAMA) is advised. However if the patient is persistently breathless or has exacerbation, then additional therapy should be offered.

This will depend on the FEV₁. If greater than 50%, NICE recommends the addition of either a long-acting beta-agonist (LABA) or LAMA. If FEV₁ is less than 50%, NICE recommends either a LABA plus an inhaled corticosteroid (ICS) (in a combination device) or a LAMA.

If exacerbations continue despite this management, then a combination of all three (LABA, ICS and LAMA) should be trialled.



[Q: 4381] OnExamination 2012 - Medicine

A 17-year-old presents to the emergency department with facial and periorbital

oedema. This is the third episode over the past two years, and on each of the previous two occasions the problem has been treated with oral corticosteroids.

On examination he has periorbital and bilateral lower limb pitting oedema. His BP is 125/72 mmHg, pulse is 72 and regular. He has no significant findings on auscultation of the chest.

Investigations show:

Haemoglobin 12.5 g/dl(13.5-17.7)

White cell count $5.0 \times 10^9/L$ (4-11)

Platelets $260 \times 10^9/L$ (150-400)

Serum Sodium 138 mmol/l (135-146)

Serum Potassium 4.2 mmol/l (3.5-5)

Creatinine 110 $\mu\text{mol/l}$ (79-118)

Albumin 24 g/l (35-50)

Urine Protein +++

Which of the following is the most appropriate initial way to treat him?

- 1- Admit for methylprednisolone and cyclophosphamide
- 2- Observe
- 3- Prednisolone 10 mg/day for six weeks
- 4- Prednisolone 60 mg/day for six weeks
- 5- Trial of ramipril

Answer & Comments

Answer: 4- Prednisolone 60 mg/day for six weeks

The repeated cycles of corticosteroid responsive nephrotic syndrome suggest that this individual has minimal change disease. Therefore he is likely once again to respond to high dose prednisolone, with a tapering dose after the first six weeks of therapy.

In patients who fail to respond initially to corticosteroids, cyclophosphamide and chlorambucil are optional second line agents.



[Q: 4382] OnExamination 2012 - Medicine

Which of the following are characteristic electrocardiogram (ECG) features of hypokalaemia?

- 1- Flattened p waves
- 2- ST elevation
- 3- U waves
- 4- Ventricular tachycardia
- 5- Wide QRS

Answer & Comments

Answer: 3- U waves

U waves are characteristic features of hypokalaemia.

Further ECG features of hypokalaemia include ST depression, low amplitude T waves and ventricular fibrillation.

Ventricular tachycardia is thought to be exceedingly rare in hypokalaemia.

The remaining answers are ECG findings typical of hyperkalaemia, together with absent P waves, tall tented t waves, asystole and ventricular fibrillation.



[Q: 4383] OnExamination 2012 - Medicine

On a CT scan of the thorax, which structure is found posteriorly (behind) to the left main bronchus?

- 1- Ascending aorta
- 2- Descending aorta
- 3- Left pulmonary artery
- 4- Right main bronchus
- 5- Superior vena cava

Answer & Comments

Answer: 2- Descending aorta

The following will be seen:

The descending aorta lies behind (posterior to) the left main bronchus.

The ascending aorta is anterior to the pulmonary trunk.

The left pulmonary artery is anterior to the left main bronchus.

The right main bronchus should be beside the left following bifurcation of the trachea.

The superior vena cava can be found next to the ascending aorta.

The oesophagus is also a posterior structure to the left main bronchus.



[Q: 4384] OnExamination 2012 - Medicine

A 42-year-old woman presents to the clinic with a chronic cough.

Which of the following features would increase the suspicion that she is suffering from asthma?

- 1- Associated dizziness
- 2- Chronic cough without wheeze
- 3- Symptoms in response to exercise
- 4- Symptoms corresponding with a cold
- 5- Voice disturbance

Answer & Comments

Answer: 3- Symptoms in response to exercise

The answer is option C, symptoms in response to exercise.

Guidelines from BTS/SIGN on the diagnosis of asthma suggest that the presence of wheeze, breathlessness, chest tightness or cough, particularly if symptoms are worse at night or in the early morning, after exercise, allergy exposure or cold air, are suggestive of the diagnosis.

A family history of atopy or asthma, personal history of atopy, widespread wheeze, low FEV₁ or PEFR also support the diagnosis.

Dizziness, light headedness, voice disturbance and chronic cough without wheeze do not support a diagnosis of asthma.



[Q: 4385] OnExamination 2012 - Medicine

A 36-year-old single woman with a history of asthma comes to the clinic complaining of symptoms of indigestion.

She uses a steroid inhaler and on examination of her oropharynx you can see obvious evidence of candidiasis. You send her for an endoscopy, which unfortunately reveals extensive oesophageal candidiasis.

Which of the following tests would be most important to consider in this patient?

- 1- CD4 count
- 2- Complement testing
- 3- Fasting blood glucose
- 4- HIV antibody testing
- 5- Immunoglobulin testing

Answer & Comments

Answer: 4- HIV antibody testing

The answer is D, HIV antibody testing.

Whilst candidiasis affecting the oropharynx may be a result of poor inhaler technique and deposition of steroid powder within the mouth, it does not usually result in oesophageal candidiasis. The other possible cause of recurrent oral and genital candida infection is diabetes mellitus, although again this would not normally lead to oesophageal disease.

In the case of this patient, immunocompromise should be suspected and HIV considered, with appropriate pre-test counselling.



[Q: 4386] OnExamination 2012 -
Medicine

A 20-year-old student comes to the clinic complaining of dysuria and minor scrotal swelling and pain. He has also noticed a purulent urethral discharge.

On examination his temperature is 37.5 C, his scrotum is mildly swollen and tender and you can express a mucopurulent discharge from his urethral meatus.

Investigations show:

Haemoglobin 13.9 g/dl(13.5-17.7)

White cell count $8.8 \times 10^9/L$ (4-11)

Platelets $269 \times 10^9/L$ (150-400)

Serum Sodium 141 mmol/l (135-146)

Serum Potassium 4.5 mmol/l (3.5-5)

Creatinine 85 micromol/l (79-118)

Urinary chlamydial antigen positive

Which of the following is the most appropriate anti-microbial therapy for him?

- 1- Azithromycin 1 g as single dose
- 2- Ciprofloxacin 500 mg BD for 7 days
- 3- Minocycline 100 mg daily for 9 days
- 4- Norfloxacin 400 mg daily for 7 days
- 5- Penicillin V 500 mg BD for 7 days

Answer & Comments

Answer: 1- Azithromycin 1 g as single dose

The answer is A, azithromycin 1 g as a single dose.

In a student population where compliance may well be a problem, giving a single dose of antibiotics for the treatment of Chlamydia is the most sensible option.

Other options for treatment of Chlamydia include minocycline, although doxycycline causes less gastrointestinal disturbance. Ofloxacin 200 mg BD for seven days is also

considered a potential option according to SIGN guidelines.

He should also be referred to the GUM clinic for screening for other sexually transmitted infections.



[Q: 4387] OnExamination 2012 -
Medicine

A 44-year-old man is brought to the hospital by his boyfriend.

Over the past few weeks he has complained of increasing headaches and nocturnal fevers. His boyfriend is now concerned that over the weekend he has taken to his bed and has become drowsy and confused.

On examination his temperature is 37.80C and BP 150/90 mmHg. He has papilloedema and neck stiffness. He refuses to comply with most of the elements of neurological testing.

Investigations show:

Haemoglobin 11.9 g/dl(13.5-17.7)

White cell count $9.7 \times 10^9/L$ (4-11)

Platelets $204 \times 10^9/L$ (150-400)

Serum Sodium 136 mmol/l (135-146)

Serum Potassium 4.0 mmol/l (3.5-5)

Creatinine 111 micromol/l (79-118)

Glucose 6.7 mmol/l (non fasting)

CSF opening pressure 22cm water turbid appearance

Glucose 6.5 mmol/l/india ink test positive

CT scan Small ventricles but otherwise unremarkable

Which of the following is the most likely diagnosis?

- 1- Cryptococcal meningitis
- 2- HIV dementia
- 3- HIV encephalopathy
- 4- Meningococcal meningitis
- 5- Tuberculous meningitis

Answer & Comments

Answer: 1- Cryptococcal meningitis

The answer is A, cryptococcal meningitis on a background of HIV infection.

The insidious onset seen here, coupled with signs of raised intracranial pressure, normal glucose on CSF sampling and positive india ink test are all strong pointers to the diagnosis of cryptococcal meningitis. India ink smears however are less sensitive and specific than CSF cryptococcal antigen test, which has a sensitivity of greater than 95%, but false negative tests can occur with a low organism burden.

MRI scanning is more sensitive than CT and may show low intensity lesions in the basal ganglia which enhance with gadolinium.

Treatment in this case would be with amphotericin B combined with flucytosine, although good results have also been seen with flucytosine and fluconazole combination therapy.

Despite aggressive intervention however, mortality is still high at around 6%.



[Q: 4388] OnExamination 2012 - Medicine

A 62-year-old man attends a clinic complaining of progressive peripheral oedema, which has got to the stage where by the end of the day he is hardly able to wear his shoes. He has a past history of hypertension which is managed with amlodipine, but nil else of note.

On examination his BP is 155/85 mmHg. His pulse is 78 and regular. His heart sounds are normal and his chest is clear. He has gross pitting oedema to mid shin on both lower limbs.

Haemoglobin 13.9 g/dl(13.5-17.7)

White cell count $7.6 \times 10^9/L$ (4-11)

Platelets $290 \times 10^9/L$ (150-400)

Serum sodium 140 mmol/l (135-146)

Serum potassium 4.0 mmol/l (3.5-5)

Creatinine 135 $\mu\text{mol/l}$ (79-118)

Albumin 24 g/l (35-50)

Urinary protein 3.5 g/24 hr

Renal biopsy: Thickened renal capillary walls seen on biopsy, but with patent lumina.

Which of the following treatments is most likely to affect this patient's prognosis?

1- Cyclophosphamide

2- Prednisolone

3- Ramipril

4- Rituximab

5- Simvastatin

Answer & Comments

Answer: 3- Ramipril

Corticosteroids alone are ineffective in the treatment of membranous nephropathy. A study of alternating monthly treatment with chlorambucil and steroids did suggest some benefit but this is open to debate and has been disputed in a number of review articles.

Rituximab, a B-cell depleting anti-CD20 chimeric monoclonal antibody has shown some benefit in a small proof of concept study, although it is unlikely to be appropriate for widespread use.

In contrast, ramipril is proven to affect both proteinuria and hypertension in patients with a diagnosis of membranous nephropathy, and is therefore the backbone of therapy for this condition.



[Q: 4389] OnExamination 2012 - Misc

A 72-year-old man comes to the surgery with his wife.

She has witnessed two seizures at home, both of which have lasted for no longer than two minutes or so, accompanied by generalised limb jerking and incontinence of urine. He has been very embarrassed about the problem and did not want to come for review. She did not call an ambulance at the time as he seemed to be comfortable afterwards and she did not want the staff to see him "in a mess".

He has a history of cerebrovascular disease having suffered a minor stroke one year earlier, and suffered a myocardial infarction some three years ago. Medication includes ramipril, amlodipine, atorvastatin and aspirin.

On examination in the surgery he looks well. His BP is 142/79 mmHg, his pulse 75 and regular. Neurological examination is unremarkable apart from some very minor loss of co-ordination affecting his left hand. He wants you to arrange some investigations before bothering the hospital doctors.

Investigations show

Haemoglobin 12.1 g/dl(13.5-18)

White cell count $8.2 \times 10^9/L$ (4-10)

Platelets $301 \times 10^9/L$ (150-400)

Sodium 141 mmol/l (134-143)

Potassium 5.1 mmol/l (3.5-5)

Creatinine 149 $\mu\text{mol/l}$ (60-120)

ESR 12(<20)

ECG Sinus rhythm

Inferior Q waves

Which one of the following initial steps would be most appropriate in this case?

- 1- Carotid ultrasound scanning
- 2- EEG
- 3- Start low dose carbamazepine

4- Start low dose sodium valproate

5- Tilt table test

Answer & Comments

Answer: 1- Carotid ultrasound scanning

EEG measurement is less useful in an elderly population, most likely because of structural changes related to age and pre-existing cerebrovascular disease. MRI however may be useful in detecting any structural abnormality such as a tumour, local vascular abnormality or old cerebral infarct.

In patients with a history of previous stroke foci of epileptic activity can occur in the penumbra around the previous infarct. In view of his previous stroke, carotid ultrasound scanning is also an important part of the initial assessment.

Finally, bearing in mind his previous infarct, he should be considered for 72 hour ECG monitoring, to exclude the possibility of a significant cardiac arrhythmia.



[Q: 4390] OnExamination 2012 - Misc

A 68-year-old female attends the falls clinic.

She had multiple falls over the last six months and she has noticed that she has become much more unsteady on her feet. Her husband tells you that she has become very restless at night and that he hardly gets any sleep.

Examination reveals bradykinesia and a jerky rest tremor. Her gait is broad based. She scores 28/30 on a mini mental state examination (MMSE).

Which of the following is the most likely diagnosis?

- 1- Corticobasal degeneration (CBD)
- 2- Idiopathic Parkinson's disease
- 3- Multiple system atrophy (MSA)

4- Progressive supranuclear palsy (PSP)

5- Vascular parkinsonism

Answer & Comments

Answer: 3- Multiple system atrophy (MSA)

Multiple system atrophy (MSA) is a progressive neurodegenerative disease. The above patient fulfils the criteria for a parkinsonian syndrome (and probably has rapid eye movement sleep disorder), but there are a number of red flags alluding to a Parkinson's plus syndrome:

The patient has multiple falls early in the disease

She has cerebellar signs - broad based (ataxic) gait

She has a 'jerky' tremor.

Option A is incorrect. Corticobasal degeneration presents with parkinsonism, but also cognitive impairment (MMSE here is normal). CBD presents with apraxia and this is responsible for the gait disturbance - it does not present with cerebellar signs as it affects the cerebral cortex and basal ganglia.

Option B is incorrect because idiopathic Parkinson's disease does not present with early falls or early postural instability. This feature usually presents late in the course of the disease. It also does not present with cerebellar signs.

Option D is incorrect because PSP does present with early falls (usually backwards) but does not present with cerebellar signs.

Option E is incorrect because the gait in vascular parkinsonism is usually shuffly with short step length and not ataxic. Rest tremor is absent in vascular parkinsonism, but postural tremor may occur.



[Q: 4391] OnExamination 2012 - Misc

An 80-year-old female presents with recurrent falls. She has fallen a few times whilst walking to the toilet at night to pass urine. She always feels light-headed prior to falling and denies palpitations.

She suffers from ischaemic heart disease, hypertension, diabetes mellitus, hypercholesterolaemia, osteoporosis and hypothyroidism. She is taking gliclazide, metformin, ramipril, doxazosin, levothyroxine, aspirin, simvastatin and weekly alendronate.

Her blood pressure is 130/70 mmHg and her pulse is 70 beats per minute and is irregular. She undergoes a medication review as part of a multi-factorial risk assessment.

Which one of the following medications is most likely to be the culprit for her symptoms?

- 1- Alendronate
- 2- Doxazosin
- 3- Levothyroxine
- 4- Metformin
- 5- Ramipril

Answer & Comments

Answer: 2- Doxazosin

The patient has symptoms of postural hypotension and subsequent presyncope.

It may be possible that she has a degree of autonomic dysfunction secondary to diabetes mellitus that would put her at even greater risk of postural hypotension with an alpha blocker. The most likely cause is the alpha blocker doxazosin that is used for hypertension.

Answers A, C, D and E are incorrect because B, doxazosin, is most likely to cause postural hypotension.



[Q: 4392] OnExamination 2012 - Misc

A 65-year-old man with end-stage idiopathic Parkinson's disease dies. His family donates his brain for research purposes.

Which characteristic histopathological structures are you most likely to find?

- 1- Amyloid plaques
- 2- Cerebral arterial atherosclerosis
- 3- Cytoplasmic inclusion bodies
- 4- Lewy bodies
- 5- Neuronal inclusion bodies

Answer & Comments

Answer: 4- Lewy bodies

Lewy bodies are characteristic in

Parkinson's disease

Corticobasal degeneration

Progressive supranuclear palsy

Motor neuron disease and

Ataxia telangiectasia.

Answer A is incorrect because amyloid plaques are characteristic in Alzheimer's dementia.

Answer B is incorrect because cerebral arterial atherosclerosis usually leads to small vessel disease and multi-infarct dementia.

Answer C is incorrect because cytoplasmic inclusion bodies are characteristically found in multi-system atrophy (MSA).

Answer E is incorrect because neuronal inclusion bodies are found in Pick's disease and fronto-temporal dementia.



[Q: 4393] OnExamination 2012 - Misc

An 80-year-old man was seen at the emergency department following a minor fall

and inability to weight bear.

His right leg was shortened and externally rotated. x Ray of the pelvis confirmed fracture neck of femur. However, the orthopaedic surgeon was concerned about the x ray appearance of the pelvis.

Further enquiry revealed that he was becoming increasingly frail and prone to develop respiratory tract infections. He also complains of pain in the lower back worse at night.

Apart from cachexia and pallor his physical examination was normal.

What is the likely diagnosis?

- 1- Chronic osteomyelitis
- 2- Metastatic carcinoma
- 3- Multiple myeloma
- 4- Osteoporosis
- 5- Paget's disease

Answer & Comments

Answer: 3- Multiple myeloma

Metastatic carcinoma is a possibility, but the patient would be expected to have symptoms of the primary malignancy, for example, prostate, lungs.

Osteoporosis and Paget's disease both can present with pathological fractures, but generalised cachexia and recurrent chest infections are against them.

Chronic osteomyelitis is more likely to present with pain in the joint, pyrexia or loss of the joint.



[Q: 4394] OnExamination 2012 - Misc

A 72-year-old lady presents to her GP with fatigue.

Her husband has noticed change in her character and her hair becoming thinner. She also complains of constipation.

Her only medical history is type II diabetes mellitus which is diet controlled.

On examination she has a pale complexion and her skin is dry. Her pulse is 50 beats per minute, regular. The rest of the examination is unremarkable.

The GP considers anaemia and requests a full blood count which shows:

Haemoglobin 9.1 g/dl (115-165)

White cell count $7.2 \times 10^9/L$ (4-11)

Platelets $147 \times 10^9/L$ (150-400)

Mean cell volume 105 fl (80-96)

What is your diagnosis?

- 1- Chronic fatigue syndrome
- 2- Depression
- 3- Diabetes mellitus
- 4- GI malignancy
- 5- Hypothyroidism

Answer & Comments

Answer: 5- Hypothyroidism

The presence of tender points is important to diagnose chronic fatigue syndrome.

Depression is a common cause of lethargy in the elderly; however other causes should be excluded.

Uncontrolled diabetes can cause lethargy and anaemia. However, other features in this scenario cannot be explained.

Occult malignancy is another cause of anaemia. However, weight loss and gastrointestinal (GI) bleeding are important features and change in character is rarely a feature.



[Q: 4395] OnExamination 2012 - Misc

A 75-year-old female presented to the Emergency department with a transient

ischaemic attack.

Her only past medical history is type II diabetes of 20 year duration. Her blood pressure was 140/90 mmHg and ECG showed atrial fibrillation.

Which one of the following is most likely to prevent her from having a stroke?

- 1- ACE inhibitors
- 2- Aspirin
- 3- β blockers
- 4- Insulin
- 5- Warfarin

Answer & Comments

Answer: 5- Warfarin

If warfarin is contraindicated, aspirin should be used.

Reducing blood pressure (BP) by any class of anti-hypertensive reduces the risk of stroke.

HOPE study showed ACE-Is reduce the relative risk of stroke which may be independent of lowering BP.

Tight glycaemic control also reduces the risk of cerebrovascular events, however in the given scenario the strongest stroke prevention strategy is warfarin.



[Q: 4396] OnExamination 2012 - Misc

A 76-year-old lady presented at the rheumatology clinic with pains of six weeks duration in the limbs and back.

She was recently treated by the GP for Bell's palsy without any significant recovery. Apart from right facial nerve palsy, physical examination was unremarkable.

The GP had enclosed the following results:

Hb 12.3 g/dl (11.5-16)

WBC $5.4 \times 10^9/L$ ($4-11 \times 10^9$)

Platelets $178 \times 10^9/L$ ($150-400 \times 10^9$)

Na 143 mmol/l (135-146)

K 3.8 mmol/l (3.5-5.0)

Urea 7.2 mmol/l (10-20)

Creatinine 112 $\mu\text{mol/l}$ (79-118)

Glucose 6.2 mmol/l (3.3 - 4.4)

CPK 97 U/l (24-170)

Bilirubin 18 $\mu\text{mol/l}$ (1 – 22)

AST 22 U/l (1-31)

ALT 25 U/l (5-35)

ALP 830 U/l (45-105)

Albumin 36 g/l (37-49)

Calcium 2.20 mmol/l (2.2-2.6)

Phosphate 1.0 mmol/l (0.8-1.4)

Select the correct diagnosis from the given list.

- 1- Bony metastases
- 2- Cholestasis
- 3- Osteomalacia
- 4- Paget's disease
- 5- Rickets

Answer & Comments

Answer: 4- Paget's disease

Bony metastases produce local bone pain while in this patient the symptoms are rather generalised.

Cholestasis is the wrong answer as it is usually accompanied by some elevation in liver enzymes and bilirubin.

Although in osteomalacia alkaline phosphatase is raised, plasma calcium and phosphate are low.

Rickets is the form of osteomalacia that develops in childhood before epiphyseal closure.



[Q: 4397] OnExamination 2012 - Misc

A 72-year-old man with longstanding Parkinson's comes to the surgery.

He is maintained on high dose L-dopa therapy but is suffering significant on/off phenomena. This is really affecting his life and he feels unable to leave the house and go on excursions with his wife.

Other past history of note includes prostatism for which he takes an alpha-blocker and a 5-alpha reductase inhibitor. He has also suffered a myocardial infarction some five years earlier.

Which one of the following would be the most appropriate next therapeutic option for him?

- 1- Amitriptyline
- 2- Cabergoline
- 3- Change to soluble levodopa before meals
- 4- Entacapone
- 5- Selegiline

Answer & Comments

Answer: 2- Cabergoline

On/off phenomena may be considerably improved either by the addition of cabergoline (a dopamine agonist) or a subcutaneous infusion of apomorphine.

Liquid forms of L-dopa may also be helpful as they allow closer titration of dose, and splitting meals into smaller snacks and one larger evening meal also affects the pharmacokinetics (PK) of L-dopa positively.



[Q: 4398] OnExamination 2012 - Misc

Which of the following statements is true regarding neck of femur fracture?

- 1- Extracapsular fractures have a higher incidence of avascular necrosis compared to intracapsular fractures.

- 2- In the young displaced fractures should be reduced and fixed urgently.
- 3- Internal rotation of the affected limb is a common clinical finding.
- 4- Mortality for elderly patients is >80% at one year.
- 5- Non-union is not a complication.

Answer & Comments

Answer: 2- In the young displaced fractures should be reduced and fixed urgently.

- A. Intracapsular femoral fractures are at increased risk of avascular necrosis due to disruption of the capsular blood supply at the time of injury.
- B. In young patients the fracture should be reduced and fixed early to decrease the risks of avascular necrosis and non-union.
- C. Patients more commonly present with a short, externally rotated limb.
- D. Mortality at one year is approximately 25%.
- C. Patients more commonly present with a short, externally rotated limb.



[Q: 4399] OnExamination 2012 - Misc

A 65-year-old man with hypertension and hypercholesterolaemia is admitted with right sided weakness. He has marked receptive dysphasia.

Examination reveals right sided facial weakness as well as right-sided hemiparesis. Sensation on the right side of the body is also impaired.

The presence of which additional finding would suggest a diagnosis of a left total anterior circulation infarct (L TACI) rather than a left partial anterior circulation infarct (L PACI)?

- 1- Bitemporal hemianopia

- 2- Right homonomous hemianopia
- 3- Left sided visual neglect
- 4- Left homonomous hemianopia
- 5- Right sided visual neglect

Answer & Comments

Answer: 2- Right homonomous hemianopia

Answer A is incorrect, because a bitemporal hemianopia is caused by a lesion of the optic chiasm.

Answer B is correct because a TACI comprises of all three of the following:

Higher cortical dysfunction which includes visuospatial disturbance (in this case visuospatial neglect), dysphasia and/or a decreased level of consciousness

Homonomous hemianopia

Motor and sensory deficits in two or more of the contralateral face/arm/leg.

Answer C is incorrect. Left sided visual neglect may be present in this patient (as part of the higher cortical dysfunction), but a homonomous hemianopia must be present to fulfil the criteria for a TACI. It is important to note that a patient may have normal visual fields, but may still have left-sided visual neglect.

Answer D is incorrect because a right TACI would cause a left homonomous hemianopia and not a right homonomous hemianopia.

Answer E is incorrect because left homonomous hemianopia must be present to fulfil the criteria for a TACI.



[Q: 4400] OnExamination 2012 - Misc

Which of the following is caused by temporal lobe lesions?

- 1- Apraxia
- 2- Astereognosis

- 3- Primitive reflexes
- 4- Visuospatial neglect
- 5- Wernicke's (receptive) aphasia

Answer & Comments

Answer: 5- Wernicke's (receptive) aphasia

Lesions of the frontal lobe include difficulties with task sequencing and executive skills.

Other symptoms include:

Expressive aphasia (receptive aphasias are due to a temporal lobe lesion)

Primitive reflexes

Perseveration (repeatedly asking the same question or performing the same task)

Anosmia and

Changes in personality.

Lesions of the parietal lobe include:

Apraxias

Neglect

Astereognosis (unable to recognise an object by feeling it) and

Vvisual field defects (typically homonymous inferior quadrantanopia).

They may also cause alaculia (inability to perform mental arithmetic).

Lesions of the temporal lobe cause:

Visual field defects (typically homonymous superior quadrantanopia)

Wernicke's (receptive) aphasia

Auditory agnosia, and

Memory impairment.

Occipital lobe lesions include:

Cortical blindness (blindness due to damage to the visual cortex and may present as Anton

syndrome where there is blindness but the patient is unaware or denies blindness)

Homonymous hemianopia and

Visual agnosia (seeing but not perceiving objects - it is different to neglect since in agnosia the objects are seen and followed but cannot be named).



[Q: 4401] OnExamination 2012 - Misc

A 32-year-old patient with type 1 diabetes who is on your clinic list is admitted with sudden loss of vision. You decide to examine the events which led up to this as part of a significant event audit.

Which of the following is part of the process of significant event audit?

- 1- Agreement, implementation and monitoring of necessary changes is an essential part of the process
- 2- Events cannot be reported as part of the QAOF
- 3- Events should not be reported to the National Patient Safety Agency, (NPSA)
- 4- Non-clinical staff should be excluded from the review process
- 5- Sudden loss of vision in a diabetic would not normally constitute a critical event

Answer & Comments

Answer: 1- Agreement, implementation and monitoring of necessary changes is an essential part of the process

As in all audits, agreement of an endorsement for change is an essential part of the process. If problems in this case with current review or scheduling of appointments for retinal photography are identified for example, then changes may be required.

Events should be reported to the NPSA and may be included as part of the QAOF (quality

and outcomes framework). Sudden and unexpected loss of vision in a diabetic is of course a critical incident. Whilst patient's vision may deteriorate over time, sudden visual loss, whilst it does occur, would not be considered the norm.

Non-clinical staff and their working procedures may be an underlying cause of a critical incident; as such their inclusion in the process is crucial.



[Q: 4402] OnExamination 2012 - Misc

A 76-year-old female presents with weakness of the left side of her body. She has no dysphasia.

Examination reveals power of 3/5 in the flexor muscles of the left upper arm and 2/5 in the extensor muscles of the left upper arm. Power in her left leg is 3/5 in the extensor muscles of the left leg and 2/5 in the flexor muscles. She has normal visual fields and sensation is intact.

An abbreviated mental test score is 10/10.

Please select the best option below to classify her stroke.

- 1- Left lacunar infarct (LACI)
- 2- Right lacunar infarct (LACI)
- 3- Right partial anterior circulation infarct (PACI)
- 4- Right posterior circulation infarct (POCI)
- 5- Right total anterior circulation infarct (TACI)

Answer & Comments

Answer: 2- Right lacunar infarct (LACI)

Option A is incorrect because a left lacunar infarct will cause right sided motor symptoms.

Answer B is correct as this patient has a pure motor stroke. This is classified as a lacunar

infarct according to the Bamford classification.

Answer C is incorrect because the patient's symptoms and signs are not consistent with a partial anterior circulation infarct.

Option D is incorrect because the patient's symptoms and signs are not consistent with a posterior circulation infarct.

Option E is incorrect because the patient's symptoms and signs are not consistent with a total anterior circulation infarct.



[Q: 4403] OnExamination 2012 - Misc

A 70-year-old lady consulted her GP for being generally unwell.

She also complained of constant severe headache and pain in the scalp while combing her hair. She has also noticed difficulty in standing up from the squatting position. She denied any visual disturbances.

Her general physical examination was unremarkable and the investigations showed a raised ESR and alkaline phosphatase.

What is an important diagnosis to consider?

- 1- Cervical spondylosis
- 2- Cluster headache
- 3- Hypothyroidism
- 4- Migraine
- 5- Temporal arteritis

Answer & Comments

Answer: 5- Temporal arteritis

Cervical spondylosis can cause occipital headache and numbness due to the entrapment of C2 sensory nerve root.

Hypothyroidism does not cause headaches.

Migraine and cluster headaches often accompany visual symptoms and headache is intermittent and fluctuating in intensity.



[Q: 4404] OnExamination 2012 - Misc

A 76-year-old man was admitted to the medical assessment unit with bleeding per rectum.

He was pain free and haemodynamically stable.

His past medical history included myocardial infarction two years ago, atrial fibrillation and chronic obstructive pulmonary disease.

His medication included digoxin 125 µgrams per day, furosemide 40 mg per day, warfarin 3 mg per day and salbutamol inhaler.

His haemoglobin was 9.6 g/dl on admission. However, ten hours later he suddenly became hypotensive and was resuscitated with two units of Gelofusine and two units of blood.

An emergency GI endoscopy was inconclusive. An angiogram confirmed the diagnosis.

What is the most likely diagnosis?

- 1- Angiodysplasia
- 2- Colonic tumour
- 3- Diverticular disease of the large bowel
- 4- Granulomatous ulceration, that is, Crohn's disease
- 5- Ischaemic colitis

Answer & Comments

Answer: 1- Angiodysplasia

Colonic tumour

Diverticular disease of the large bowel and

Granulomatous ulceration pathology

can be identified at the endoscopy.

Ischaemic colitis can present with massive bleeding, but abdominal pain is a predominant feature.



[Q: 4405] OnExamination 2012 - Misc

An 84-year-old man was referred for investigation of anaemia. He had been feeling weak and lethargic.

His past medical history included diverticular disease and duodenal ulcer.

Investigations showed:

Hb 7.2 g/dl (130-180)

WBC $4.8 \times 10^9/L$ (4-11)

Platelets $182 \times 10^9/L$ (150-400)

MCV 112 fl (80-96)

Iron $32 \mu\text{mol/l}$ (12-30)

TIBC $70 \mu\text{mol/l}$ (45-75)

Serum folate 24nmol/l (2-11)

Serum B₁₂ 270pmol/l (160-760)

TSH 3.4mU/l (0.4-5.0)

LDH 200U/l (10-250)

Blood film: dimorphic picture

Bone marrow aspirate: generalised increase in iron stores

Faecal occult blood: negative.

Which of the following is the correct diagnosis?

- 1- Gastrointestinal blood loss
- 2- Haemolytic anaemia
- 3- Iron deficiency anaemia
- 4- Megaloblastic anaemia
- 5- Sideroblastic anaemia

Answer & Comments

Answer: 5- Sideroblastic anaemia

Sideroblastic anaemia is a condition in which the bone marrow produces atypical nucleated erythroblasts with granules of iron accumulated in the perinuclear membrane (sideroblasts). There is inability of iron utilisation, resulting in disordered haem

synthesis and hence microcytic hypochromic cells and dimorphic blood film.

Sideroblastic anaemia is most often associated with myelodysplastic syndromes, but can also be inherited. In addition, can occur in other bone marrow conditions including myeloma, polycythaemia rubra vera and leukaemia. Secondary causes include rheumatoid arthritis, SLE, chronic infections and hypothyroidism.

Clinical features are those related to anaemia (and or cytopenia). Diagnosis requires bone marrow examination, which shows ring sideroblasts and increased iron stores. Full blood count shows anaemia, with a normal or increased MCV. Serum iron and transferrin saturation are usually high, and the blood film shows a dimorphic population of normal and hypochromic red blood cells. Total iron binding capacity is usually normal.

Treatment is in general supportive, or of the underlying condition. Transfusion can be considered, with care to avoid iron overload.

Megaloblastic anaemia is a broad term, often caused by Vitamin B₁₂ or folate deficiency. Blood film shows macrocytes with hypersegmented polymorphs.

Options A and C are unlikely because of normal serum iron and total iron-binding capacity (TIBC) and negative faecal occult blood.

A normal lactate dehydrogenase (LDH) means haemolytic anaemia is unlikely.



[Q: 4406] OnExamination 2012 - Misc

A 68-year-old man presents for a follow up visit in clinic.

He presented six months ago with short term memory loss, loss of verbal fluency and dysphasia. His wife then reported that he has become 'less tolerant' and 'overreacts'. Examination at that point was normal and he

scored 25/30 on the mini mental state examination.

A CT brain was essentially normal. Full blood count, biochemical tests, thyroid function, B12 and folate were all normal. He scored 19/30 on a repeat MMSE today. He is diagnosed as having probable Alzheimer's disease and is commenced on donepezil.

The drug acts by inhibiting which of the following enzymes?

- 1- Catechol-O-methyl transferase
- 2- Cholinesterase
- 3- Dopamine decarboxylase
- 4- Glutamic acid decarboxylase
- 5- Monoamine oxidase

Answer & Comments

Answer: 2- Cholinesterase

Donepezil is a cholinesterase inhibitor. It increases acetylcholine levels in the brain and has been shown to slow progression of Alzheimer's dementia.

Answer A is incorrect because catechol-O-methyl transferase is responsible for degradation of dopamine, adrenaline and noradrenaline and catechol-O-methyl transferase inhibitors are used in the treatment of Parkinson's disease.

Answer C is incorrect because dopamine decarboxylase degrades dopamine and dopa decarboxylase inhibitors are used in the treatment of Parkinson's disease.

Answer D is incorrect because glutamic acid decarboxylase is responsible for converting glutamic acid into gamma-aminobutyric acid which is an inhibitory neurotransmitter. Inhibition of this enzyme is likely to give rise to uncontrollable movements such as chorea.

Answer E is incorrect because monoamine oxidase breaks down most cerebral neurotransmitters. Monoamine oxidase

inhibitors can be used in the treatment of depression.

Reference:

www.nice.org.uk/CG42



[Q: 4407] OnExamination 2012 - Misc

A 55-year-old man presents with a right sided rest tremor and slowness of movement.

A year ago he noticed that he could not smell his food. He has not had any falls and his eye movements are normal. His past medical history is unremarkable and he does not take any medication.

Which of the following structures is most likely to be most affected?

- 1- Left cerebellar hemisphere
- 2- Left cerebral neocortex
- 3- Olfactory nerve
- 4- Red nucleus
- 5- Substantia nigra

Answer & Comments

Answer: 5- Substantia nigra

The diagnosis is most likely idiopathic Parkinson's disease.

The patient has a pre-motor symptom of olfactory disturbance and fulfils the UK-PDS brain bank criteria for Parkinson's disease. He is developing motor symptoms due to loss of more than 50% of the dopaminergic neurones in the substantia nigra.

Option A is incorrect because there are no cerebellar signs (he has normal eye movements and no nystagmus).

Option B is incorrect as lesions of the outermost layer of the cerebral cortex present with problems of memory, attention and consciousness.

Option C is incorrect as isolated lesions of the olfactory nerve would not present with tremor.

Option D is incorrect as the red nucleus is responsible for motor coordination of the upper arm and shoulder.

Loss of dopaminergic neurones in the substantia nigra is predominantly responsible for the symptoms in Parkinson's disease.



[Q: 4408] OnExamination 2012 - Misc

An 86-year-old woman presents with a third episode of urinary frequency and dysuria in eight months.

A urine dipstick is positive for leukocytes, but negative for nitrites. Examination of the genito-urinary area reveals marked atrophic vaginitis and she is commenced on topical oestrogen therapy.

Oestrogen exerts its beneficial effect on the urogenital tissue by which of the following?

- 1- Decreasing para-urethral blood flow
- 2- Decreasing urethral closing pressure
- 3- Increasing para-urethral collagen concentration
- 4- Preventing proliferation of Lactobacilli in the vagina
- 5- Increasing vaginal pH

Answer & Comments

Answer: 3- Increasing para-urethral collagen concentration

Option A is incorrect because oestrogen increases para-urethral blood flow.

Option B is incorrect as oestrogen increases urethral closing pressure by increasing para-urethral collagen concentration and organisation.

Option D is incorrect because oestrogen promotes the proliferation of Lactobacilli in the vagina.

Option E is incorrect because oestrogen decreases vaginal pH by preventing Gram negative bacterial colonisation.



[Q: 4409] OnExamination 2012 - Misc

An 82-year-old resident of a residential home was seen at the Emergency department for restlessness and aggressive behaviour.

He has been incontinent of urine and also had few falls. He was placed in the residential home after the death of his wife due to severe arthritis in his hands and knees. His only past medical history includes hypothyroidism, for which he takes thyroxine 50 µgrams per day.

On examination he is disorientated in time, place and person and smells strongly of urine. There are no focal neurological signs.

What is the likely diagnosis?

- 1- Delirium
- 2- Dementia
- 3- Hypoglycaemia
- 4- Myxoedema madness
- 5- Transient ischaemic attack (TIA)

Answer & Comments

Answer: 1- Delirium

Delirium is a common neuropsychiatric syndrome in the elderly characterised by concurrent impairments in cognition and behaviour. There are numerous causes, but it is commonly associated with underlying medical illness and medication. Untreated it has significant morbidity and mortality.

The cardinal features of delirium are recent onset of fluctuating awareness, impairment of memory and attention and disorganised

thinking. Additional features may include visual hallucinations and disturbance of the sleep-wake cycle. Three subtypes are increasingly recognised: hypoactive, hyperactive and mixed.

Delirium is a clinical diagnosis, but there are a number of assessment tools which can aid the clinician. The mini-mental state examination (MMSE) and abbreviated mental test score (AMTS) can assess cognition but not all features of delirium. In the UK (and USA) guidelines recommend the Confusion Assessment Method (CAM) for detecting delirium. The diagnosis requires criteria 1 and 2 to be present, plus either 3 or 4. This has been shown to have a sensitivity and specificity of over 90%:

1. Acute onset and fluctuating course
2. Inattention
3. Disorganised thinking
4. Altered level of consciousness

Distinguishing between delirium and dementia can be difficult, and often they coexist. It is safest to assume delirium is present, and attempt to find an underlying cause before settling on a diagnosis of dementia.

Delirium should be avoided if possible by reducing the risk factors, in particularly predisposing medications. Orientating communication, therapeutic activities, early mobilisation, non-pharmacological approaches to sleep and anxiety, maintaining nutrition and hydration, adaptive equipment for vision and hearing impairment and pain management have also be shown to reduce the incidence.

Immediate identification and treatment of precipitants, withdrawal of culprit drugs and supportive care (correction of hypoxia, hydration, nutrition, mobilisation) are critical in the treatment of delirium. Drug treatment

should be reserved for patients who pose a risk to themselves or others.

A patient on replacement thyroxine is unlikely to have severe hypothyroidism (myxoedema madness) as thyroid-stimulating hormone (TSH) should have been regularly checked. However, non-compliance with medication is possible.

All confused patients should be checked for hypoglycaemia, however, given the information available this is not the answer.

TIA may present with confusion but dysphasia and weakness are prominent symptoms.



[Q: 4410] OnExamination 2012 - Misc

An 80-year-old man was recovering from diarrhoea when he developed difficulty in swallowing and had a choking fit while eating a sandwich.

He took to his bed, complained of back pain, bilateral leg pain, numbness in the feet and could not stand up.

He smoked 20 cigarettes a day and drank 20 units of alcohol each week. Past medical history included bilateral hip replacements and osteoarthritis of both knees.

On examination he was confused with slurred speech. There was bilateral ptosis, ophthalmoplegia and mild proximal weakness in both legs. All tendon reflexes were absent and the plantar responses were equivocal.

He did not co-operate with the examination of the sensory system. The bladder was palpable up to the level of the umbilicus. The prostate was smoothly enlarged and the rectum was full of faeces.

What is the most likely diagnosis?

- 1- Brain stem infarction
- 2- Guillain-Barre syndrome
- 3- Motor neurone disease
- 4- Myasthenia gravis

5- Transverse myelitis

Answer & Comments

Answer: 2- Guillain-Barre syndrome

Guillain-Barre syndrome, also known as acute post infective neuropathy, often follows one to three weeks after an infection. *Campylobacter jejuni* is a well recognised cause of severe GBS.

A brain stem infarct producing bilateral signs is not compatible with life.

Motor neurone disease has a more insidious presentation and does not affect the eye muscles. Myasthenia gravis may present like this.

However, despite muscular weakness, deep tendon reflexes are often preserved and urinary incontinence and diarrhoea may be a feature due to cholinergic crisis.

Transverse myelitis is inflammation of the spinal cord and does not produce brain stem signs.



[Q: 4411] OnExamination 2012 - Misc

A 75-year-old female presented to the Emergency department with a transient ischaemic attack.

Her only past medical history is type II diabetes of 20 year duration.

Her blood pressure was 140/90 mmHg and ECG showed atrial fibrillation.

Which one of the following is the strongest risk factor for stroke?

- 1- Age ? 75
- 2- Atrial fibrillation (AF)
- 3- Diabetes mellitus
- 4- Female sex
- 5- Hypercholesterolaemia

Answer & Comments

Answer: 2- Atrial fibrillation (AF)

The following are risk factors for stroke:

Age (above 65)

Diabetes mellitus and

Hypercholesterolaemia.

Stroke is more common in males than in females. Hence option D is incorrect.



[Q: 4412] OnExamination 2012 - Misc

You are attending a 70-year-old man recently treated for Parkinson's disease, to which treatment he has been showing good response.

His son wants to know how likely he is to develop Parkinson's disease. There is no family history of Parkinson's disease.

What is the correct factor in this case?

- 1- Inheritance pattern of this disease is not known
- 2- It all depends on the exposure to the environmental factors
- 3- Late onset disease is not usually familial
- 4- The disease is autosomal dominant
- 5- The disease is autosomal recessive

Answer & Comments

Answer: 1- Inheritance pattern of this disease is not known

Parkinson's disease is a common neurodegenerative disorder which selectively affects dopaminergic neurons of the substantia nigra, culminating in their destruction. After approximately 50% of the dopamine neurones, and 75-80% of striatal dopamine is lost patients start to exhibit the classical signs of bradykinesia, resting tremor and rigidity.

Despite many years of research, the cause of Parkinson's disease is not fully understood. The relative contribution of genetic and environmental factors still remains unclear. Early studies showed that protoxin n-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP) causes parkinsonism in animals and humans. Other environmental toxins have also been linked, but there is no clear causation between exposure and disease.

Up until 10 years ago, it was widely thought that Parkinson's disease was not a genetic disorder. However, since then inherited forms have been identified and there have been a number of genetic findings culminating in the cloning of several genes from loci which have been given the nomenclature PARK1 to PARK 12. ?-synuclein is thought to be an important molecule in the dopaminergic signalling pathways.

In addition single genes have been linked to heritable forms of Parkinson's disease, including SNCA, Parkin, PINK1, DJ1 and LRRK2. The inheritance pattern differs depending on the gene that is altered: LRRK2 and SNCA mutations are autosomal dominant; PARK2, PARK7 and PINK1 are autosomal recessive.

Despite the identification of these genes, the majority of the cases remain idiopathic and therefore the correct answer is option A.



[Q: 4413] OnExamination 2012 - Misc

A 70-year-old alcoholic presented with pain in the left hip joint.

He had been in good health with his only past medical history being of sudden blindness in the right eye which was treated with high dose steroids.

x Ray of the left hip showed severe degeneration of femoral head with loss of joint space.

What is the most likely cause of the joint deformity?

- 1- Age related osteoarthritis
- 2- Avascular necrosis of the femoral head
- 3- Monoarticular rheumatoid arthritis with eye involvement
- 4- Perthes' disease
- 5- Reiter's syndrome

Answer & Comments

Answer: 2- Avascular necrosis of the femoral head

Age related osteoarthritis is incorrect as osteoarthritis is generally bilateral and x ray changes are osteophytes, subchondral sclerosis and subchondral cyst formation.

Rheumatoid arthritis does not cause blindness and the x ray changes include juxta-articular bony erosions, periarticular osteopenia, periarticular soft tissue swelling and joint subluxation.

Perthes' disease is a disease of childhood.

Reiter's syndrome presents more acutely with painful eyes and painful joints. In chronic cases x ray changes are similar to those of RA.



[Q: 4414] OnExamination 2012 - Misc

A 34-year-old man with a known history of Crohn's disease was admitted to hospital with abdominal pain and features of perforation.

He underwent laparotomy and a perforation of the terminal ileum was found with free faecal fluid in the abdominal cavity. He was transferred to the intensive care unit (ITU).

Together with traditional antimicrobial and supportive ITU therapy, which of the following therapeutic measures is most likely to improve this patient's outcome?

- 1- High-dose intravenous corticosteroids

- 2- Low-dose intravenous corticosteroids
- 3- Recombinant anti-endotoxin antibody
- 4- Recombinant human antithrombin III
- 5- Recombinant human tissue-factor pathway inhibitor

Answer & Comments

Answer: 2- Low-dose intravenous corticosteroids

The use of corticosteroids in sepsis remains controversial.

Meta-analyses of all the trials of high-dose steroids (for example, methylprednisolone 1 g) have confirmed that there is either no benefit, or even that there is an adverse effect in septic patients. However, more recent randomised controlled trials have suggested that there is a benefit in sepsis when lower physiological doses of steroids are given.

The precise mechanism is not fully understood, although it is well known that septic patients have low levels of endogenous steroids.

The production of recombinant human anticoagulants has gathered pace in recent years and several products have been tested. There have been randomised clinical trials of recombinant human antithrombin III (Kyber Sept trial), activated protein C (PROWESS trial) and tissue-factor pathway inhibitor (OPTIMIST trial). Of these, only recombinant activated protein C has shown any significant survival benefit at 28 days. However, subsequent studies have failed to demonstrate a survival benefit, and have shown an increased bleeding risk. Activated protein C is therefore no longer recommended for the treatment of sepsis.



[Q: 4415] OnExamination 2012 - Misc

Mr YB is a patient who regularly attends the anticoagulant clinic.

He is very concerned as he has been recently started on a new drug by his GP. He asks you whether it would enhance the anticoagulant effect.

Which of the following may increase the anticoagulant effect in patients taking warfarin?

- 1- Clopidogrel
- 2- Carbamazepine
- 3- Griseofulvin
- 4- Phenobarbitone
- 5- St. John's wort

Answer & Comments

Answer: 1- Clopidogrel

Clopidogrel does not appear to have a clinically relevant effect on the pharmacokinetics or pharmacodynamics of warfarin.

However, the concurrent use of clopidogrel with warfarin, increases the bleeding risk.

All other drugs in the options are C-P450 enzyme inducers so would DECREASE the anticoagulant effect

Stockley Drug Interactions 2011



[Q: 4416] OnExamination 2012 - Misc

A patient on your ward is prescribed warfarin as she has recently been diagnosed with atrial fibrillation. Her desired INR is 2.5

On the morning ward round you take the patient's INR which comes back as 5.2 from the laboratory.

There are no signs of bleeding.

What would be your next course of action?

- 1- Decrease the dose of warfarin
- 2- Do nothing, as there are no signs of bleeding
- 3- Increase the dose of warfarin
- 4- Start a heparin infusion
- 5- Stop the warfarin

Answer & Comments

Answer: 5- Stop the warfarin

The main adverse effect of all oral anticoagulants is haemorrhage.

Checking the INR and omitting doses when appropriate is essential; if the anticoagulant is stopped but not reversed, the INR should be measured two to three days later to ensure that it is falling.

The following recommendations are based on the result of the INR and whether there is major or minor bleeding; the recommendations apply to patients taking warfarin:

Major bleeding - stop warfarin; give phytonadione (vitamin K1) 5-10 mg by slow intravenous injection; give dried prothrombin complex (factors II, VII, IX, and X) 30-50 units/kg (if dried prothrombin complex unavailable, fresh frozen plasma 15 mL/kg can be given but is less effective).

INR 8.0, no bleeding or minor bleeding - stop warfarin and give phytonadione (vitamin K1) 2.5-5 mg by mouth using the intravenous preparation orally [unlicensed use], or 0.5-1 mg by slow intravenous injection (if complete reversal required 5-10 mg by slow intravenous injection); repeat dose of phytonadione if INR still too high after 24 hours; restart warfarin when INR less than 5.0.

INR 5.0-8.0, no bleeding - stop warfarin; minor bleeding - stop warfarin and give phytonadione (vitamin K1) 1-2.5 mg by mouth using the intravenous preparation

orally [unlicensed use]; restart warfarin when INR less than 5.0.

Unexpected bleeding at therapeutic levels - always investigate possibility of underlying cause, for example, unsuspected renal or gastrointestinal tract pathology.



[Q: 4417] OnExamination 2012 - Misc

Mrs HV is taking an antidepressant.

Her husband recently passed away and she was diagnosed as being clinically depressed.

Since taking the antidepressants, she has been complaining of drowsiness, confusion and fatigue.

Depletion of which of the following electrolytes may be causing Mrs HV's symptoms?

- 1- Chloride
- 2- Magnesium
- 3- Phosphate
- 4- Potassium
- 5- Sodium

Answer & Comments

Answer: 5- Sodium

The Committee on Safety of Medicines (CSM) have reported that hyponatraemia is associated with all types of antidepressants; however it has been reported more frequently with selective serotonin reuptake inhibitors (SSRIs) than with other antidepressants.

Hyponatraemia should be considered in all patients who develop drowsiness, confusion or convulsions whilst taking an antidepressant.

BNF 60



[Q: 4418] OnExamination 2012 - Misc

Mr UP is taking bendroflumethiazide for hypertension.

Which of the following is likely to increase whilst on bendroflumethiazide therapy?

- 1- Magnesium
- 2- Potassium
- 3- Sodium
- 4- Uric acid
- 5- White cell count

Answer & Comments

Answer: 4- Uric acid

Hydrochlorothiazide and other thiazide diuretics may cause metabolic disturbances especially at high doses.

They may provoke hyperglycaemia and glycosuria in diabetic and other susceptible patients. They may cause hyperuricaemia and precipitate attacks of gout in some patients.

Thiazide diuretics may be associated with electrolyte imbalances including hypochloraemic alkalosis, hyponatraemia, and hypokalaemia.

Hypokalaemia intensifies the effect of digitalis on cardiac muscle and treatment with digitalis or its glycosides may have to be temporarily suspended. Patients with cirrhosis of the liver are particularly at risk from hypokalaemia.

Hyponatraemia may occur in patients with severe heart failure who are very oedematous, particularly with large doses used with restricted salt in the diet.

The urinary excretion of calcium is reduced. Hypomagnesaemia has also occurred.

Adverse changes in plasma lipids have also been noted but their clinical significance is unclear.



[Q: 4419] OnExamination 2012 - Misc

A patient post retrosternal thyroidectomy resection has sudden onset shortness of breath.

On examination, she is talking clearly but has decreased breath sounds on her right side with hyper-resonance on percussion. Her blood pressure is 110/80 mmHg, pulse 95 beats per minute, respiratory rate 24/min and SpO₂ 92 on air.

Which of the following would be most appropriate for her?

- 1- Chest x ray
- 2- Furosemide 40 mg intravenously
- 3- Intercostal chest drain insertion
- 4- Needle thoracocentesis
- 5- Removal of surgical clips

Answer & Comments

Answer: 1- Chest x ray

According to the scenario above this lady has a pneumothorax.

She is not in extremis (suggesting a tension pneumothorax) so needle thoracocentesis is not required.

The history and examination are suggestive of a pneumothorax and therefore, with her being relatively stable, the most appropriate first step would be confirmation with chest x ray followed by chest drain insertion.

Furosemide would not help.



[Q: 4420] OnExamination 2012 - Misc

A patient needs central venous access for total parenteral nutrition (TPN).

Which of the following is the cleanest site for placement?

- 1- Left femoral

- 2- Left internal jugular
- 3- Right femoral
- 4- Right internal jugular
- 5- Right subclavian

Answer & Comments

Answer: 5- Right subclavian

Right or left subclavian is regarded as the cleanest site for central venous access. It also the most tolerated by patients.

However the incidence of subclinical pneumothorax even in the hands of experienced clinicians has led to it falling out of favour.



[Q: 4421] OnExamination 2012 - Misc

Which of the following statements regarding the internal jugular vein and relations is true?

- 1- Lies medial to the common carotid artery
- 2- On the right side crosses the first part of the subclavian artery
- 3- Originates at the sphenoid sinus
- 4- Passes posterior to the carotid artery
- 5- The right internal jugular is usually smaller than the left

Answer & Comments

Answer: 2- On the right side crosses the first part of the subclavian artery

The anatomy of the jugular vein is important given that it is the site of insertion of central venous catheters.

The internal jugular vein originates at the jugular foramen.

It initially lies posterior and lateral to the carotid artery.

As it descends in the carotid sheath it lies lateral first to the internal then the common carotid artery within the carotid sheath.

It passes anterior to the subclavian artery to join the subclavian vein to form the brachiocephalic vein.

The internal jugular vein receives a lymphatic trunk at its union with the subclavian vein.

The internal jugular vein is usually of considerable size, and the right internal jugular is usually larger than the left.

The external jugular vein drains into the subclavian vein.



[Q: 4422] OnExamination 2012 - Misc

A 64-year-old man is admitted with central epigastric pain. Abdominal x ray shows a dilated bowel loop.

His temperature is 37.0°C, pulse 130 bpm, blood pressure 80/50 mmHg, respiratory rate 29/min, SpO₂ 90% on air.

His full blood count reveals:

Haemoglobin 13.0 g/dl(13.0-18.0)

White cell count $3.2 \times 10^9/L$ (4-11)

Platelets $108 \times 10^9/L$ (150-400)

MCV 105 fl(80-96)

Which of the following is the most appropriate initial treatment of this patient?

- 1- 100% oxygen
- 2- 2 x 14 gauge venflons and 2 litres Hartmann's
- 3- Intensive care
- 4- Intubation and ventilation
- 5- Invasive monitoring

Answer & Comments

Answer: 1- 100% oxygen

This patient has systemic inflammatory response syndrome, possibly caused by acute pancreatitis given the finding of an isolated dilated loop of bowel on abdominal radiograph. However, the initial treatment is the same independent of the underlying cause. All of the above answers are reasonable, however resuscitation of the sick patient still follows the

Airway

Breathing

Circulation

algorithm.

Airway control and oxygen to maintain normal saturations is the first part of that algorithm. Subsequent fluid resuscitation and treatment of the underlying cause can then be initiated. The need for invasive monitoring and intensive care is then assessed, depending on the response to initial treatment.



[Q: 4423] OnExamination 2012 - Misc

A 56-year-old man diagnosed with systemic inflammatory response syndrome (SIRS) secondary to pancreatitis is admitted to the High Dependency Unit. He has a pulse of 109 beats/min and a blood pressure of 89/74 mmHg despite receiving IV fluids and urine output of 25 ml/hour after catheterisation.

Which of the following is the most appropriate course of action for this patient?

- 1- A central line
- 2- A CT abdomen
- 3- A surgical referral
- 4- An arterial line
- 5- Broad spectrum antibiotics

Answer & Comments

Answer: 1- A central line

Early goal directed therapy (EGDT) in cases of SIRS or septic shock is becoming increasingly recognised as potentially beneficial. If fluids are not achieving haemodynamic stability, and there is indication of hypoperfusion as indicated by oliguria or lactataemia, then vigorous resuscitation is indicated.

EGDT aims to increase organ perfusion through restoration of mean arterial pressure using inotropes if necessary, maintaining central venous pressure (CVP), maintaining oxygenation, and using SjVO₂ (jugular venous oxygen saturation) as a guide to oxygen utilisation at the tissue level. SjVO₂ higher than 70% is indicative of organ hypoperfusion, as oxygen is not being extracted.

Insertion of a central line above allows measurement of CVP, SjVO₂ and the use of inotropes.



[Q: 4424] OnExamination 2012 - Misc

Mr TB is prescribed warfarin for prophylaxis of DVT.

Which vitamin does warfarin antagonise?

- 1- A
- 2- B6
- 3- C
- 4- D
- 5- K

Answer & Comments

Answer: 5- K

Warfarin inhibits hepatic vitamin K epoxide reductase, which is an enzyme that converts vitamin K to its active form (hydroquinone).

This results in the impairment of the hepatic synthesis of vitamin K dependent clotting factors (II [prothrombin], VII, IX, and X).

Medical Pharmacology & Therapeutics 3rd Ed, 2010



[Q: 4425] OnExamination 2012 - Misc

Which of the following is not a feature of cannabinoids?

- 1- 9-tetrahydrocannabinol is the active constituent of the resin
- 2- Bioavailability after oral administration is about 70%
- 3- Inhibits eicosanoid synthesis
- 4- Lowers intraocular pressure
- 5- Naloxone blocks the antinociceptive actions of cannabinoids

Answer & Comments

Answer: 2- Bioavailability after oral administration is about 70%

Cannabinoids are derived from the resin of cannabis sativa, and 9-tetrahydrocannabinol (9-THC) is its most important pharmacologically active constituent.

Oral bioavailability of THC whether given in the pure form or as THC in marijuana is low and extremely variable ranging between five and 20% with effects occurring 0.5-3 hours later. Bioavailability of THC in a marijuana cigarette or pipe also rarely exceeds 10 to 20%.

Naloxone and other opioid receptor antagonists block the analgesic actions of cannabinoids.

Synthetic cannabinoids reduce arachidonic acid-induced inflammation by inhibiting eicosanoid production.



[Q: 4426] OnExamination 2012 - Misc

Mr VU is taking amitriptyline for depressive illness.

He comes to see you at a routine outpatient appointment and informs you that he has been experiencing some side effects with his amitriptyline therapy.

Which of the following is classed as a side effect for this drug?

- 1- Gout
- 2- Hypokalaemia
- 3- Renal stones
- 4- Taste disturbances
- 5- Urinary retention

Answer & Comments

Answer: 5- Urinary retention

Many adverse effects of amitriptyline and similar tricyclic antidepressants are caused by their antimuscarinic actions.

Antimuscarinic effects are relatively common and occur before an antidepressant effect is obtained. They include:

Dry mouth

Constipation occasionally leading to paralytic ileus

Urinary retention

Blurred vision and disturbances in accommodation

Increased intraocular pressure and

Hyperthermia.

Tolerance is often achieved if treatment is continued and adverse effects may be less troublesome if treatment is begun with small doses and then increased gradually, although this may delay the clinical response.

Drowsiness may also be common, although a few tricyclic antidepressants possess little or no sedative potential and may produce nervousness and insomnia.

Other neurological adverse effects include:

Headache

Peripheral neuropathy

Tremor

Ataxia

Epileptiform seizures

Tinnitus and

Occasional extrapyramidal symptoms including speech difficulties (dysarthria).

Confusion, hallucinations, or delirium may occur, particularly in the elderly, and mania or hypomania, and behavioural disturbances (particularly in children) have been reported.

Gastrointestinal complaints include:

Sour or metallic taste

Stomatitis and

Gastric irritation with nausea and vomiting.

Orthostatic hypotension and tachycardia can occur in patients without a history of cardiovascular disease, and may be particularly troublesome in the elderly.

Hypersensitivity reactions, such as urticaria and angioedema, and photosensitisation have been reported and, rarely, cholestatic jaundice and blood disorders, including:

Eosinophilia

Bone marrow depression

Thrombocytopenia

Leucopenia and

Agranulocytosis.

Endocrine effects include testicular enlargement, gynaecomastia and breast enlargement, and galactorrhoea. Sexual dysfunction may also occur.

Changes in blood sugar concentrations may also occur, and, very occasionally,

hyponatraemia associated with inappropriate secretion of antidiuretic hormone.

Other adverse effects that have been reported are increased appetite with weight gain (or occasionally anorexia with weight loss). Sweating may be a problem.

Martindale

BNF 60



[Q: 4427] OnExamination 2012 - Misc

You would like to prescribe a selective serotonin reuptake inhibitor (SSRI) for a 14-year-old girl who has been diagnosed as being clinically depressed.

After much debate and intervention from various healthcare professionals, it was decided to prescribe her fluoxetine.

For which one of the following parameters should the patient be closely monitored, especially at the beginning of treatment?

- 1- Coldness of extremities
- 2- Hostility
- 3- Hyperglycaemia
- 4- Prothrombin time
- 5- Tachycardia

Answer & Comments

Answer: 2- Hostility

The balance of risks and benefits for the treatment of depressive illness in individuals under the age of 18 years is considered unfavourable for citalopram, escitalopram, paroxetine and sertraline.

Clinical trials have failed to show efficacy and have shown an increase in harmful outcomes.

Only fluoxetine has shown to be effective in treating depressive illness in children, but careful monitoring for the above sign is required.

BNF 60



[Q: 4428] OnExamination 2012 - Misc

Ms YF is prescribed ciprofloxacin 500 mg twice daily for the treatment of cystitis.

In which of the following conditions should ciprofloxacin be used with caution?

- 1- Asthma
- 2- Diabetes
- 3- Epilepsy
- 4- Glaucoma
- 5- Heart failure

Answer & Comments

Answer: 3- Epilepsy

Quinolones should be used with caution in patients with a history of epilepsy or conditions that predispose to seizures, in glucose-6-phosphate dehydrogenase (G6PD) deficiency, myasthenia gravis (risk of exacerbation), and in children or adolescents.

The CSM has warned that quinolones may induce convulsions in patients with or without a history of convulsions; taking non-steroidal anti-inflammatory drugs (NSAIDs) at the same time may also induce them.

It should also be noted that ciprofloxacin is contraindicated in pregnancy.

BNF 60



[Q: 4429] OnExamination 2012 - Misc

A 10-year-old child presents with a respiratory tract infection. You decide to treat him empirically with a broad spectrum antibiotic.

The child is taking no other medication, has no other co-morbidity factors and has no known detected allergies.

Which of the following antibiotics is contraindicated in this patient?

- 1- Amoxicillin
- 2- Clarithromycin
- 3- Erythromycin
- 4- Flucloxacillin
- 5- Minocycline

Answer & Comments

Answer: 5- Minocycline

Tetracyclines can bind to calcium and deposit on growing bones and teeth. This may cause staining and occasionally dental hypoplasia.

Therefore, tetracyclines should not be given to children under the age of 12 or to pregnant or breastfeeding women.

However, doxycycline can be used (unlicensed) for the treatment of anthrax in children.



[Q: 4430] OnExamination 2012 - Misc

Which of the following statements regarding the internal jugular vein and relations is true?

- 1- Lies lateral to the common carotid artery
- 2- Originates at the carotid canal
- 3- Passes behind the clavicle to join the superior vena cava
- 4- Passes posterior to the subclavian artery
- 5- Receives a lymphatic trunk at its union with the external jugular vein.

Answer & Comments

Answer: 1- Lies lateral to the common carotid artery

The internal jugular vein originates at the jugular foramen.

It initially lies posterior to the carotid artery. As it descends in the carotid sheath it lies

lateral first to the internal then the common carotid artery within the carotid sheath.

It passes anterior to the subclavian artery to join the subclavian vein and then forms the brachiocephalic vein; the left and right brachiocephalic veins unite to form the superior vena cava.

The internal jugular vein receives a lymphatic trunk at its union with the subclavian vein.

The external jugular vein drains into the subclavian vein.



[Q: 4431] OnExamination 2012 - Misc

A 78-year-old male who presents with increasing dysphagia is diagnosed with an inoperable carcinoma of the distal oesophagus. Oesophageal spasm causes food to stick after swallowing which causes odynophagia.

Which drug would be most helpful in relieving his chronic pain?

- 1- Clodronate
- 2- Dexamethasone
- 3- Nifedipine
- 4- Oxybutynin
- 5- Pinaverium

Answer & Comments

Answer: 3- Nifedipine

Nifedipine helps relieve painful oesophageal spasm and tenesmus associated with gastrointestinal tumours and could be used to relieve his odynophagia.

Clodronate inhibits osteoclastic bone resorption and is used to treat malignant bone pain and the associated hypercalcaemia.

Pinaverium is used to reduce the pain duration associated with irritable bowel syndrome (IBS).

Corticosteroids are used to treat pain from central nervous system tumours and painful bladder spasm may be relieved by oxybutynin.



[Q: 4432] OnExamination 2012 - Misc

A 66-year-old male in intensive care who is receiving an escalating noradrenaline infusion (currently at 0.76 mcg/kg/min), has a blood pressure of 90/50 mmHg, pulse of 90 beats per min, a central venous pressure of 10mmHg, capillary refill time of 2-3 seconds has received 2000 mls of colloid in 3 hours. His plasma lactate concentration is 2.9 mmol/l (<1.5).

Which of the following is an appropriate method of measuring adequate intravascular filling?

- 1- LiDCO (lithium dilution cardiac output)
- 2- Oesophageal Doppler monitoring
- 3- PiCCO (pulse contour cardiac output)
- 4- Pulmonary artery flotation catheter (PAFC)
- 5- Transoesophageal echocardiography (TOE)

Answer & Comments

Answer: 3- PiCCO (pulse contour cardiac output)

PiCCO gives indications of cardiac output, extravascular lung water, intravascular filling and only requires a central line and a PiCCO femoral arterial line and as such is relatively simple to use.

It would also not be unreasonable to insert an oesophageal Doppler device; however they have greater interobserver variation and require a degree of experience to use and are prone to misplacement.

LiDCO is still not validated or practical to be widely used.

PAFC are used widely in the USA however a study has questioned their safety and they have fallen out of favour in the UK.

TOE requires considerable expertise to use and is not suitable for cardiac output studies.



[Q: 4433] OnExamination 2012 - Misc

A 56-year-old man with severe brain damage is apnoeic, unsedated, and temperature 36.9°C.

He is intubated and ventilated. His biochemistry is normal.

The combination of which of the following specialists would be able to confirm brain stem death?

- 1- Consultant/specialist trainee with one years experience
- 2- Consultant/specialist trainee with three years experience
- 3- Consultant/specialist trainee with four years experience
- 4- Consultant/specialist trainee with five years experience
- 5- Consultant/specialist trainee with two years experience

Answer & Comments

Answer: 4- Consultant/specialist trainee with five years experience

The conventional criteria previously established for clinical death were based upon lack of cardiorespiratory function.

The development of organ transplantation highlighted patients who had conditions incompatible with life, but who continued to have some form of cardiorespiratory function with artificial support. This led to a code of practice for the diagnosis of brainstem death.

This is based on the knowledge that when the brainstem is damaged to such a degree that its functions are irreversibly destroyed, the heart will inevitably stop beating shortly afterwards. When this occurs, therefore, the patient is dead even though respiration and circulation can be artificially maintained. Brain stem function is checked through set criteria, and the findings must be agreed by at least two senior doctors. One should be a consultant, and the other must have at least five years post registration who has experience in the testing of brain stem death.

'Life-support' should be withdrawn at this point, but consideration should be taken as to whether the person would be a suitable organ donor.



[Q: 4434] OnExamination 2012 - Misc

A 56-year-old man with septic shock is fully ventilated, on continuous veno-venous haemofiltration receiving noradrenaline, vancomycin and ciprofloxacin.

He has a mean arterial pressure [MAP] of 60 mmHg which is then not improved after changing from noradrenaline to adrenaline. There is no evidence of myocardial dysfunction.

Which of the following would be the most appropriate next step in managing this patient?

- 1- ACTH stimulation test
- 2- Activated protein C
- 3- Change of inotropes
- 4- Hydrocortisone
- 5- Nitric oxide

Answer & Comments

Answer: 4- Hydrocortisone

Adrenaline is the first choice for change of inotropes if blood pressure is unresponsive to noradrenaline or dopamine.

The current 'Surviving Sepsis' guidelines do not recommend an adrenocorticotrophic hormone (ACTH) stimulation test prior to administration of hydrocortisone. Hydrocortisone is preferable to dexamethasone. The addition of fludrocortisone to hydrocortisone is optional.

Activated protein C may be prescribed if there is sepsis-related organ dysfunction and a high risk of death (APACHE II 25 or more).

Changing inotropes again would probably not be effective.

Nitric oxide is a non-proven therapy in adult respiratory distress syndrome (ARDS).

This is a complicated area and difficult to remember if you are not regularly on ITU.



[Q: 4435] OnExamination 2012 - Misc

Mr YB is admitted on your ward with endocarditis and is prescribed vancomycin IV.

You monitor the patient for signs of toxicity as it has a narrow therapeutic index.

Which of the following is a result of vancomycin toxicity?

- 1- Bradycardia
- 2- Dry mouth
- 3- Erythema multiforme
- 4- Hepatotoxicity
- 5- Ototoxicity

Answer & Comments

Answer: 5- Ototoxicity

Ototoxicity is associated with vancomycin, and is more likely in patients with high plasma concentrations, or with renal impairment or pre-existing hearing loss.

It may progress after drug withdrawal, and may be irreversible. Hearing loss may be preceded by tinnitus, which must be regarded as a sign to stop treatment.

The important level to measure here is the trough level as opposed to the peak level with gentamicin.

(Martindale)



[Q: 4436] OnExamination 2012 - Misc

A 56-year-old man is admitted with epigastric pain after drinking heavily.

He has a temperature of 36.9°C, a pulse of 95/min, a blood pressure of 85/60 mmHg, and a respiratory rate of 32/min.

Investigations reveal:

Haemoglobin 12.6 g/dl(13.0-18.0)

Platelets $169 \times 10^9/L$ (150-400)

White cell count $3.9 \times 10^9/L$ (4-11)

Which of the following is the diagnosis?

- 1- Leaking aortic aneurysm
- 2- Multi-organ dysfunction syndrome (MODS)
- 3- Severe sepsis
- 4- Septic shock
- 5- Systemic inflammatory response syndrome (SIRS)

Answer & Comments

Answer: 5- Systemic inflammatory response syndrome (SIRS)

This patient has features of pancreatitis. He also has hypotension, and leucopenia. He therefore fulfils the criteria for systemic inflammatory response syndrome. This is equivalent to sepsis, but occurs in the absence of infection (e.g. in pancreatitis).

SIRS is defined as two or more of the following:

Temperature more than 38°C or less than 36°C.

Heart rate more than 90 beats/min.

Respiratory rate more than 20 breaths/min or PaCO₂ less than 4.3kPa.

WBC count $12,000/mm^3$, less than $4000/mm^3$, or more than 10% immature (bands) form.

A leaking aortic aneurysm is still a possibility, however a decreased white cell count would not be expected.

We do not have enough information to diagnose multi-organ dysfunction. There is no evidence of infection to make a diagnosis of septic shock or severe sepsis. For information, sepsis is defined as the association of systemic inflammatory responses with evidence of microbial origin. Severe sepsis also has hypoperfusion or dysfunction of at least one organ system, and septic shock is this plus hypotension refractory to fluid resuscitation.



[Q: 4437] OnExamination 2012 - Misc

An 82-year-old lady was admitted to hospital with fever and confusion.

On examination her temperature was 39°C, blood pressure was 80/45 mmHg with a pulse of 110 beats per minute regular with numerous petechiae over the abdomen.

After taking blood, it was noted that there was continued bleeding from the venous puncture site.

A urinary catheter was inserted and yielded 1500 ml of cloudy yellow offensive-smelling urine.

Which of the following is correct concerning this patient?

- 1- Circulating levels of activated protein C (aPC) will be reduced
- 2- Levels of D dimer will be reduced

- 3- Levels of fibrin degradation products (FDPs) will be reduced
- 4- The activated partial thromboplastin time (APTT) will be below the normal range
- 5- The platelet count is likely to be elevated

Answer & Comments

Answer: 1- Circulating levels of activated protein C (aPC) will be reduced

The patient has disseminated intravascular coagulation (DIC) secondary to sepsis.

Given the history, the most likely source is the urinary tract.

Several coagulation abnormalities are seen in sepsis including:

APTT elevated

PT elevated

FDPs elevated

D dimers elevated

Platelets reduced

Fibrinogen reduced

Protein C reduced

Antithrombin reduced.



[Q: 4438] OnExamination 2012 - Misc

A 67-year-old man complains of dizziness and faintness. He has insulin dependent diabetes mellitus and he had a sigmoid colectomy three days previously.

His blood pressure is 80/50 mmHg, his pulse 110 beats per min, his respiratory rate 24/min, and he has SpO₂ 99% on air. His plasma glucose concentration is 18 mmol/l (3.0-6.0 fasting).

Which of the following is the most appropriate investigation for this patient?

- 1- Arterial blood gas

- 2- Chest x ray
- 3- Electrocardiogram
- 4- Serum lactate
- 5- Urine ketones

Answer & Comments

Answer: 3- Electrocardiogram

This man may have a cardiac cause for his dizziness. The highest prevalence of myocardial infarction (MI) is 72 hours post-operation. Patients with diabetes may not have chest pain due to autonomic dysfunction.

The differential diagnosis would include pulmonary embolus. It may also include diabetic ketoacidosis, but this would be unlikely with his glucose at 18 mmol/L and would not directly explain his hypotension. Also, he would be expected to have a slightly higher respiratory rate than 24/min.

The most appropriate immediate investigation in this scenario would be ECG.



[Q: 4439] OnExamination 2012 - Misc

A 23-year-old man with known peanut allergy presented to the Emergency department with anaphylaxis. He has a swollen face and lips.

His BP is 90/60 mmHg, pulse 110 bpm and he is wheezy.

Which of the following formulations of adrenaline should be given?

- 1- 0.5 ml of 1:10000 adrenaline IM
- 2- 0.5 ml of 1:1000 adrenaline IM
- 3- 5 ml of 1:1000 adrenaline IM
- 4- 10 ml of 1:10000 adrenaline IV
- 5- Nebulised adrenaline

Answer & Comments

Answer: 2- 0.5 ml of 1:1000 adrenaline IM

For adults, a dose of 0.5 mL adrenaline 1:1000 solution (500 micrograms) should be administered intramuscularly, and repeated after about five minutes in the absence of clinical improvement or if deterioration occurs after the initial treatment especially if consciousness becomes - or remains - impaired as a result of hypotension.

The intramuscular (IM) route for adrenaline is the route of choice for most healthcare providers. There is a much greater risk of causing harmful side effects by inappropriate dosage or misdiagnosis of anaphylaxis when using IV adrenaline.

Adult EpiPen which allergy sufferers can carry with them contains 0.3 mg or 0.15 mg adrenaline in a 1:1000 dilution for intramuscular (IM) injection.



[Q: 4440] OnExamination 2012 - Misc

Which of the following statements regarding the subclavian vein and its relations is correct?

- 1- Begins at the lateral border of the first rib
- 2- Forms the axillary vein
- 3- Joins the superior vena cava
- 4- The subclavian vein and internal jugular vein form the brachiocephalic trunk
- 5- The subclavian vein passes posterior to scalenus anterior.

Answer & Comments

Answer: 1- Begins at the lateral border of the first rib

The subclavian vein is a continuation of the axillary vein, beginning at the lateral border of the first rib.

It passes anterior to scalenus anterior.

The subclavian and internal jugular vein unite to form the brachiocephalic vein,

subsequently the left and right brachiocephalic veins unite to form the superior vena cava.

The brachiocephalic trunk is a branch of the aortic arch, which divides to form the right subclavian and right common carotid arteries.



[Q: 4441] OnExamination 2012 - Misc

An 18-year-old male is admitted with a history of diarrhoea and vomiting associated with weakness and lethargy.

His motor power in the distal arms and legs is decreased and he describes difficulty swallowing. His forced vital capacity (FVC) is 1.5 litres.

Which of the following is the most appropriate immediate treatment for this condition?

- 1- Cyclophosphamide
- 2- Intravenous immunoglobulin therapy (IgG) 0.5 g/kg
- 3- Intubation and ventilation
- 4- Plasmapheresis
- 5- Prednisolone 60 mg

Answer & Comments

Answer: 2- Intravenous immunoglobulin therapy (IgG) 0.5 g/kg

This scenario is suggestive of Guillain-Barre syndrome (GBS).

Dysphagia is a dangerous symptom suggestive of bulbar involvement. However a FVC of 1.5 litres is not an indication for immediate ventilation (less than 1 litre is).

First line therapy is intravenous IgG.

Plasmapheresis can also be used but requires specialist equipment.

Steroids are of no benefit.

Cyclophosphamide although an immune suppressant is a red herring.



[Q: 4442] OnExamination 2012 - Misc

A 67-year-old man is three days post-operation for a sigmoid colectomy. He has insulin dependent diabetes mellitus. He complains of dizziness and faintness.

His blood pressure is 80/50 mmHg, his pulse is 110 bpm, he has a respiratory rate 24/min, and he has SpO₂ 99% on air. His blood glucose is 18 mmol/L (3.0-6.0 fasting).

His electrocardiogram shows ST depression of 2 mm in leads II, III and AVF.

Which of the following is the initial drug therapy for this patient?

- 1- Aspirin 300mg
- 2- Clexane 1 mg/kg subcutaneously
- 3- Clopidogrel 75 mg
- 4- Diamorphine 2.5 mg
- 5- Glycerol tri-nitrate 800 mcg sublingually

Answer & Comments

Answer: 1- Aspirin 300mg

Initial treatment of an acute coronary syndrome is aspirin 300 mg. This should be safe in the post-surgical patient with no signs of bleeding at three days post operation. Clexane would also be given, but aspirin initially.

The dose of clopidogrel is 300 mg in an acute coronary syndrome.

Diamorphine is used to treat anxiety and pain, neither of which is commented upon.

GTN would be reasonable to try, however the blood pressure is low.

Remember that in the diabetic chest pain may not be a feature of acute coronary syndrome due to autonomic dysfunction, and

in most post-surgical patients myocardial infarct is silent.



[Q: 4443] OnExamination 2012 - Misc

You are asked to see a 64-year-old man post oversew of a duodenal ulcer.

He is confused. His SpO₂ is 97 on oxygen. Pulse 110 beats per minute, blood pressure 100/50 mmHg, respiratory rate 32/min and his urine output is 10 ml in the last hour.

Which of the following is the most appropriate treatment for this man?

- 1- 100% oxygen via face mask
- 2- Central line and arterial line
- 3- Colloid 500 ml stat
- 4- Haloperidol 2.5 mg intravenously
- 5- Noradrenaline via central line

Answer & Comments

Answer: 3- Colloid 500 ml stat

Post-operative confusion is common in the elderly however this can be caused by a low perfusion state.

His observations are indicative of underfilling/dehydration.

Of the options given a fluid bolus is reasonable. Some would argue that 100% oxygen comes before fluids but with an SpO₂ of 97 it is unlikely that hypoxia is contributing to his problems (nonetheless oxygen therapy would be recommended).

The other options would come further down the line if initial interventions were unsuccessful and he deteriorated.



[Q: 4444] OnExamination 2012 - Misc

A 64-year-old man is admitted with central epigastric pain.

Abdominal x ray shows a central dilated bowel loop. His temperature is 37.0°C, pulse 130 beats per min, blood pressure 80/50 mmHg, respiratory rate 29/min and SpO₂ 90 on air.

His full blood count reveals:

Haemoglobin 13.0 g/dl (13.0-18.0)

White cell count $3.2 \times 10^9/L$ (4-11)

Platelets $108 \times 10^9/L$ (150-400)

MCV 105 fl (80-96)

Which of the following is the most likely diagnosis?

- 1- Gall stone ileus
- 2- Ischaemic bowel
- 3- Pancreatitis
- 4- Perforated duodenal ulcer
- 5- Small bowel obstruction

Answer & Comments

Answer: 3- Pancreatitis

Ischaemic bowel and perforated duodenal ulcer would be high in the differential list. However the history and raised mean corpuscular volume (MCV) suggests alcohol use and the severity of his observations would suggest a systemic inflammatory response which is more common with pancreatitis.

Acute pancreatitis has a mortality of 7-10%, often due to sepsis or multi-organ failure. There are a number of scoring systems which can be used to guide prognosis, but they are unreliable within the first 48 hours of the illness. Gallstones account for 50% of cases, with the majority of the rest being associated with alcohol.

Patients typically present with severe epigastric pain which radiates to the back and vomiting. As seen in this example, there is often a systemic inflammatory response. Amylase is markedly raised, often in excess of

four times the normal value. Early complications include ARDS (adult respiratory distress syndrome), acute kidney injury and disseminated intravascular coagulation (DIC).

Treatment is essentially supportive, and high levels of monitoring are usually required (often in the intensive care unit). Those patients who are found to have gallstones should be considered for emergency ERCP, and all should have a cholecystectomy during the same admission.



[Q: 4445] OnExamination 2012 - Misc

A 22-year-old woman comes to the genetics clinic for advice.

She has a family history of Parkinson's disease. Her brother was recently diagnosed with Parkinson's at the age of 26, her father was previously diagnosed at the age of 56, and her grandfather at the age of 69.

Which of the following phenomena is exhibited here?

- 1- Autosomal dominance
- 2- Complete penetrance
- 3- DNA methylation
- 4- Genetic anticipation
- 5- Incomplete penetrance

Answer & Comments

Answer: 4- Genetic anticipation

Autosomal dominance has no bearing on whether the condition presents at a younger age with successive generations, although familial Parkinson's is usually a dominant disorder.

DNA methylation does change gene expression but is not thought to be the cause of anticipation seen here.

Complete and incomplete penetrance refers to the range of symptoms seen with a particular condition.



[Q: 4446] OnExamination 2012 - Misc

A 16-year-old boy presents with chronic pain in his left thigh over the past few months. He has seen his GP on four occasions and has been given paracetamol and told that these are growing pains.

The pain has now reached the point that he refuses to mobilise beyond walking around the house.

On examination his BP is 132/72 mmHg, pulse is 67 and regular. Clinical examination is unremarkable apart from the fact that he appears tender over the left femur.

Investigations show:

Haemoglobin 12.2 g/dl(13.5-17.7)

White cell count $8.0 \times 10^9/L$ (4-11)

Platelets $178 \times 10^9/L$ (150-400)

Sodium 138 mmol/l (135-146)

Potassium 4.3 mmol/l(3.5-5)

Creatinine 120 $\mu\text{mol/l}$ (79-118)

Alanine aminotransferase 44 U/l (5-40)

Alkaline phosphatase 780 U/l (39-117)

Which of the following is the most likely diagnosis?

- 1- Hepatoma
- 2- Osteosarcoma
- 3- Paget's disease
- 4- Rickets
- 5- Stress fracture

Answer & Comments

Answer: 2- Osteosarcoma

Hepatoma in the presence of normal transaminases is extremely unlikely.

Paget's disease, whilst associated with a raised alkaline phosphatase does not usually occur in this age group.

Rickets would not be expected to occur in a single bone, and a stress fracture would not present with many months of pain.



[Q: 4447] OnExamination 2012 - Misc

A 38-year-old woman presents with pain down the lateral aspect of her right hip. She had completed a half marathon for charity the previous weekend, but had previously only managed around seven to eight miles in training runs.

She says she noticed the pain after she had warmed down after the run, and says that all hip movements and weight bearing seem to make the pain much worse. It also seems to radiate down to the lateral aspect of her thigh, and she has problems lying on the affected side due to pain.

On examination she has point tenderness over the greater trochanter.

Investigations show

Haemoglobin 12.9 g/dl(13.5-18)

White cell count $4.5 \times 10^9/L$ (4-10)

Platelets $201 \times 10^9/L$ (150-400)

ESR 12 mm/hr(1-20)

Hip x ray Normal

Which of the following is the most likely diagnosis?

- 1- Avascular necrosis of the hip
- 2- Osteoarthritis of the hip
- 3- Septic arthritis of the hip
- 4- Tendonitis
- 5- Trochanteric bursitis

Answer & Comments

Answer: 5- Trochanteric bursitis

This patient has a global reduction in movement affecting the right hip, and point tenderness over the trochanter indicates trochanteric bursitis very strongly. Both local trauma and an unaccustomed period of exercise may precipitate symptoms.

Management involves both appropriate physiotherapy and use of non-steroidals.

Some advocates support local corticosteroid injection, and one randomised controlled trial has shown a prolonged benefit with use of hydrocortisone and lidocaine.



[Q: 4448] OnExamination 2012 - Misc

Which of the following is associated with cavitation on the chest X-ray?

- 1- Klebsiella pneumonia
- 2- Legionnaires' disease
- 3- Pneumococcal pneumonia
- 4- Sarcoidosis
- 5- Viral pneumonia

Answer & Comments

Answer: 1- Klebsiella pneumonia

Cavitating lesions are caused by:

- squamous cell carcinoma
- abscess (Staph. aureus, Klebsiella and Pseudomonas aeruginosa)
- lymphoma
- rheumatoid nodule
- pulmonary infarction or
- Wegener's granulomatosis.



[Q: 4449] OnExamination 2012 - Misc

You are asked to see a 78-year-old man who has been admitted to the ward for terminal

care after a massive subarachnoid haemorrhage.

He is unconscious but the nurses are concerned that he has pooling of secretions, tries to cough and becomes distressed.

On examination he is unconscious, but has a respiratory rate of 30 and has a death rattle. He is receiving diamorphine via a syringe driver.

Which of the following is the most appropriate treatment for him?

- 1- Atropine nebulisers
- 2- Hyoscine administered subcutaneously
- 3- Increase the dose of diamorphine via the syringe driver
- 4- Salbutamol nebulisers
- 5- Saline nebulisers

Answer & Comments

Answer: 2- Hyoscine administered subcutaneously

The answer is hyoscine s/c which can be given up to three times per day in boluses of 10-20 mg.

Both hyoscine and atropine when given subcutaneously are thought to be equally appropriate for drying up secretions.

Whilst both atropine and salbutamol given in nebulised form are bronchodilators, they are unlikely to be effective in relieving his symptoms.

Saline nebulisers are only likely to irritate him further and cause worsening coughing.

Increasing his diamorphine may be associated with significant risk of hastening a respiratory arrest.



[Q: 4450] OnExamination 2012 - Misc

A 47-year-old patient with metastatic breast

cancer is admitted for bisphosphonate infusion for severe bone pain.

With help from the palliative care team the GP has tried several medications without significant benefit. The patient agrees to admission for a bisphosphonate infusion. She asks about side effects of bisphosphonates.

Which complication or side effect is more likely to occur when bisphosphonates are used in cancer-related symptoms?

- 1- Diarrhoea
- 2- Hypocalcaemia
- 3- Oesophageal erosions
- 4- Osteonecrosis of the jaw
- 5- Renal failure

Answer & Comments

Answer: 4- Osteonecrosis of the jaw

The risk of osteonecrosis of the jaw is much greater for patients receiving intravenous bisphosphonates in the treatment of cancer.

MHRA/CHM advice is as follows:

'Risk factors for developing osteonecrosis of the jaw that should be considered are: potency of bisphosphonate (highest for zoledronate), route of administration, cumulative dose, duration and type of malignant disease, concomitant treatment, smoking, comorbid conditions, and history of dental disease.

All patients receiving bisphosphonates for cancer should have a dental check-up (and any necessary remedial work should be performed) before bisphosphonate treatment.

However, urgent bisphosphonate treatment should not be delayed, and a dental check-up should be carried out as soon as possible in these patients. All other patients who are prescribed bisphosphonates should have a

dental examination only if they have poor dental health.'

The likelihood of other side effects is not dependent on an underlying cancer diagnosis.



[Q: 4451] OnExamination 2012 - Misc

You are caring for a patient with metastatic uterine cancer who is in pain.

Her GP has been treating her in line with the WHO analgesic ladder. She has been started on codeine as step two on the ladder. Unfortunately she gains no additive analgesic effect from codeine.

What is the likely mechanism for this poor response to codeine?

- 1- Concomitant use of cyclizine
- 2- Concomitant use of prednisolone
- 3- CYP2D6 poor metaboliser
- 4- Hypercalcaemia
- 5- Renal impairment

Answer & Comments

Answer: 3- CYP2D6 poor metaboliser

The analgesic effect of codeine depends on its conversion to morphine by the CYP2D6 hepatic enzyme.

Up to 10% of Caucasians are CYP2D6 poor metabolisers and are unlikely to derive any analgesia from it.

If hepatic metabolism is impaired for any other reason (drugs or hepatic impairment) patients are also unlikely to benefit from codeine.



[Q: 4452] OnExamination 2012 - Misc

A patient with a history of pancreatic cancer complains of central abdominal pain.

The patient is not constipated and his most recent blood tests were unremarkable. His GP has started him on paracetamol 1 g QDS and asks you, as the speciality doctor in palliative medicine, for advice on how to improve his pain relief.

What is the most appropriate drug choice?

- 1- Codeine 8 mg + paracetamol
- 2- Codeine 30 mg + paracetamol
- 3- Double dose of PCM
- 4- Oramorph
- 5- Tramadol

Answer & Comments

Answer: 2- Codeine 30 mg + paracetamol

This question requires knowledge of the WHO analgesic ladder.

This underpins the management of cancer (and non-cancer) pain management. It provides a step-wise management strategy to pain relief.

Step one is simple analgesia

Step two uses a weak opioid plus a non-opioid.

This patient has not gained relief from step one so moving to step two (that is, codeine 30 mg plus paracetamol) is the logical next choice of those available here.

Codeine 8 mg in combination with paracetamol has not been convincingly shown to offer greater analgesic benefit over paracetamol alone and is therefore not recommended (as patients can develop codeine side effects).



[Q: 4453] OnExamination 2012 - Misc

You are working as a palliative medicine speciality doctor and you are asked to assess

and admit a 56-year-old woman with metastatic lung cancer to the local hospice.

She was diagnosed with cancer two months ago and has been increasingly troubled with low back pain. Her GP has been increasing doses of morphine without effect. The GP asked for admission for help with symptom control.

On questioning the patient complains of low back pain with occasional feeling of weakness and 'tingling' in her legs. There has been no bowel or bladder disturbance.

On examination there is some tenderness over L2 and power in both legs is slightly reduced. There are no other abnormalities to find.

What is the most appropriate management?

- 1- Arrange lumbar x ray
- 2- Arrange urgent MRI
- 3- Bed rest
- 4- Increase analgesia and arrange physiotherapy
- 5- Urgent referral to local oncology service

Answer & Comments

Answer: 5- Urgent referral to local oncology service

Metastatic spinal cord compression (MSCC) is defined as spinal cord or cauda equina compression by direct pressure and/or induction of vertebral collapse or instability by metastatic spread or direct extension of malignancy that threatens or causes neurological disability. The true incidence of MSCC in England and Wales is not known but studies have suggested it is as much as 80 cases per million per year (approximately 4000 per year). MSCC is a medical emergency, and a low index of suspicion is required as the initial features may be non-specific. Recent studies have shown the median times from the onset of back pain and nerve root pain to referral were 3 months and 9 weeks

respectively. Nearly half of all patients with MSCC were unable to walk at the time of diagnosis and of these, 67% had recovered no function after 1 month.

In this scenario, there is a significant chance of MSCC and you are in an out-of-hospital setting so urgent referral to the oncologists is the most appropriate answer. NICE guidance recommends this is done immediately in anybody with neurological symptoms and signs, and patients transferred to a unit with 24-hour capability for MRI and definitive treatment of MSCC. The oncologists are likely to recommend high dose dexamethasone whilst awaiting transfer.

If you were in a hospital setting you would want to discuss the case with the oncologists and orthopaedic surgeons and organise an MRI scan. This MRI should be of the whole spine, unless there is a specific contraindication. NICE recommends it be done within 24 hours in patients with neurological signs, and within one week if there is spinal pain suggestive of metastases. Occasionally the MRI should be done sooner if there is a pressing clinical need for emergency surgery, but out of hours MRI should only be performed in clinical circumstances where there is an emergency need and intention to proceed immediately to treatment. This should therefore be decided by either the oncology or orthopaedic team.

Definitive treatment of MSCC is either surgery or radiotherapy. At present, relatively few patients with MSCC in the UK receive surgery. However, research evidence suggests that early surgery may be more effective than radiotherapy at maintaining mobility in a selected subset of patients.



[Q: 4454] OnExamination 2012 - Misc

You are currently working on a respiratory ward and looking after a patient with

mesothelioma. She was diagnosed with mesothelioma six months before and has deteriorated rapidly.

She was admitted with breathlessness and a pleural effusion was diagnosed, but not drained. Thirty six hours after admission the patient passed away. You are called by the bereavement office to complete the death certificate as soon as possible as the family wishes to arrange the funeral for early the following week.

Which is the most appropriate action to take?

- 1- Ask consultant to complete the death certificate
- 2- Complete the death certificate yourself as you know the family
- 3- Discuss the case with the patients oncologist
- 4- Discuss with the patients GP to confirm the diagnosis
- 5- Refer to the coroner's office.

Answer & Comments

Answer: 5- Refer to the coroner's office.

Patients with mesothelioma must be referred to the coroner's office as it is considered an industrial disease.

The coroner will often request a limited post mortem to confirm the diagnosis and an inquest held.

It is your statutory obligation to inform the coroner in this situation and so even though it will be a difficult time for the family, they must be informed of this (and the reasoning) in a sensitive way.

You could ask the oncologist but the advice will be the same and it would just cause delays.



[Q: 4455] OnExamination 2012 - Misc

An elderly woman with a background of multiple myeloma has been started on opioid analgesia for low back pain.

Since starting opioids she has had problems with nausea and has been tried on two different agents. Her GP started a third antiemetic two weeks ago.

Her husband has noticed she seems restless and cannot keep still. He has become increasingly concerned in the last few days she has been unable to keep up with him on their walks and has generally 'slowed down'.

From the list of drugs, on which has the patient most likely been started?

- 1- Cyclizine
- 2- Domperidone
- 3- Haloperidol
- 4- Levomepromazine
- 5- Ondansetron

Answer & Comments

Answer: 3- Haloperidol

This scenario describes a patient developing drug-induced parkinsonism (DIP).

This can occur when drugs with dopamine receptor antagonist (D2) activity are initiated as antiemetics. Commonly used drugs which fall into this category include haloperidol, domperidone and metoclopramide.

Akathisia and bradykinesia are more common in drug induced parkinsonism.

Of the drugs listed here, haloperidol and domperidone have significant D2 receptor activity. Haloperidol has much greater affinity for central D2 receptors as domperidone less readily crosses the blood brain barrier.

Haloperidol is therefore much more likely to cause DIP.



[Q: 4456] OnExamination 2012 - Misc

A 51-year-old man with a history of locally advanced lung cancer presents to his GP with a short history of facial flushing and swelling and breathlessness.

He looks unwell and becomes more breathless when he lies flat to allow examination of his abdomen. At 45 degrees his JVP is elevated but his lung fields are clear. The GP phones his local hospice for advice from the duty palliative care physician.

What is the most appropriate management step to give this GP?

- 1- Breathing exercises
- 2- Oramorph to help him relax
- 3- Oxygen
- 4- Refer immediately to local oncological service
- 5- Send to hospital for CXR

Answer & Comments

Answer: 4- Refer immediately to local oncological service

The clinical features described in this scenario are typical of superior vena cava obstruction and this is a palliative care emergency.

It is most commonly caused by carcinoma of the bronchus and symptoms can come on rapidly.

If there is a high clinical suspicion the patient should be referred to the local oncology service to confirm the diagnosis and initiate management.

The other options would delay diagnosis and management.



[Q: 4457] OnExamination 2012 - Misc

You are working in a hospice for a palliative medicine team and you are called by one of

the local GPs for medication advice.

A patient of hers has recently been diagnosed with pancreatic cancer and associated severe pain. The GP started the patient on morphine sulphate modified release and an antiemetic.

Two days after starting the anti-emetic the patient came back to see the GP complaining of feeling more sleepy, blurred vision at times, constipation and a very dry mouth.

Of the choices, on which antiemetic was the patient most likely to have been started?

- 1- Cyclizine
- 2- Domperidone
- 3- Haloperidol
- 4- Metoclopramide
- 5- Ondansetron

Answer & Comments

Answer: 1- Cyclizine

Cyclizine is a commonly used antihistamine antiemetic and its primary site of action is the vomiting centre (which is rich in histamine and muscarinic cholinergic receptors).

Cyclizine has a strong affinity for muscarinic receptors and therefore anticholinergic side effects (dry mouth, drowsiness, blurred vision, constipation, etc) are common, especially in the first few days.

The other drugs listed do not have significant muscarinic receptor affinity.



[Q: 4458] OnExamination 2012 - Misc

A woman with a background of metastatic lung cancer is admitted to the Emergency department with a history of increasing drowsiness, confusion, vomiting and myoclonic jerks.

On examination she is also found to have small pupils.

On questioning her husband you find out she is on morphine sulphate modified release and cyclizine, and has recently had antibiotic treatment for a chest infection.

In view of the features from the examination and history, what is the most likely underlying aetiology for this patient's presenting problem?

- 1- Hypercalcaemia
- 2- Hyperglycaemia
- 3- Hypoxia
- 4- Morphine toxicity
- 5- Urinary tract infection

Answer & Comments

Answer: 4- Morphine toxicity

Reduced conscious level, hallucinations, vomiting, myoclonic jerks and pinpoint pupils are features of opioid toxicity.

All the options can cause an acute deterioration in a palliative care patient and should be excluded in the appropriate situations.

However this combination, and especially small pupils and myoclonic jerks, points strongly toward opioid toxicity. When opioid toxicity is diagnosed, a cause (such as renal impairment) must be sought.



[Q: 4459] OnExamination 2012 - Misc

A 73-year-old female patient has been admitted from the palliative medicine clinic for an infusion of bisphosphonate for intractable bone pain. This pain has not responded to opioids or NSAIDs and the consultant thinks bisphosphonates are indicated.

The patient undergoes an infusion of pamidronate and you are asked to review her the next day. Unfortunately she has not

noticed any improvement in her pain and asks you why this is so.

Choose the most appropriate next step?

- 1- Alter her opioids
- 2- Increase her opioids
- 3- Prescribe a further dose of pamidronate
- 4- Prescribe an alternative bisphosphonate
- 5- Reassure her benefit can be delayed by a few days

Answer & Comments

Answer: 5- Reassure her benefit can be delayed by a few days

Bisphosphonates are useful adjuncts for bone pain, especially in breast cancer and myeloma.

The patient described has not derived significant benefit from opioids so increasing or altering the dose would have been tried before and was not effective (hence her referral for specialist management).

The beneficial effect of bisphosphonates can be delayed for up to two weeks and can last for one month.

Therefore the correct response is to reassure the patient the benefit may be delayed.



[Q: 4460] OnExamination 2012 - Misc

A 67-year-old man has been diagnosed with metastatic lung cancer. He has moderate pain and has been started on morphine slow release twice a day. After a few doses he becomes nauseated and vomits on one occasion.

You are working in palliative care and are asked to advise on the most appropriate antiemetic. He has no other medical history.

Which of the following is the most appropriate first choice management option?

- 1- Cyclizine
- 2- Domperidone
- 3- Haloperidol
- 4- Ondansetron
- 5- Withdraw morphine

Answer & Comments

Answer: 3- Haloperidol

Haloperidol is a first line antiemetic for opioid-induced nausea in the palliative care setting. Its action is predominantly via D2-receptor antagonism in the chemoreceptor trigger zone (CTZ) in the brain stem.

Ninety per cent of patients taking morphine require antiemetics (morphine stimulates D2 receptors in the CTZ).

Cyclizine, although commonly used is less effective.

Domperidone also has some central D2 antagonism but less than haloperidol.

Ondansetron is a 5HT3 antagonist and is mainly used in post-chemotherapy or radiotherapy induced nausea.

Withdrawing morphine, although would resolve the problem, is not an appropriate response as the patient has moderate pain and nausea can be managed with antiemetics.



[Q: 4461] OnExamination 2012 - Misc

A 37-year-old man with advanced lymphoma is admitted to a hospice for control of a variety of symptoms. He is known to have advanced mediastinal disease.

After three days you are called to assess him as he has complained to the nurses of shortness of breath. On arrival in his room he looks unwell. He is struggling to complete sentences because of breathlessness. His venous pressure is elevated and his pulse is

120. His chest is clear with a normal percussion note.

Which is the most likely diagnosis?

- 1- Left ventricular failure
- 2- Panic attack
- 3- Pericardial effusion
- 4- Pleural effusion
- 5- Pneumothorax

Answer & Comments

Answer: 3- Pericardial effusion

Diagnosing pericardial effusions early is essential and should always be considered as a differential for breathlessness, especially in patients with mediastinal disease.

A strong clinical clue is breathlessness with raised venous pressure but normal chest examination.

Answers A, D and E would be likely to result in an abnormal chest examination.

A panic attack would not cause these examination findings (unless panic occurred on top of another condition).



[Q: 4462] OnExamination 2012 - Misc

A 35-year-old woman has been admitted to the local hospice for control of pain.

She has been diagnosed with advanced cervical cancer and has continued chemotherapy. During her prolonged admission to the hospice she is transferred to the local oncology centre for cisplatin chemotherapy. The following day she is profoundly nauseated. The staff nurse looking after this lady asks you to prescribe an antiemetic.

What is the most appropriate antiemetic for this indication?

- 1- Cyclizine

- 2- Domperidone
- 3- Haloperidol
- 4- Metoclopramide
- 5- Ondansetron

Answer & Comments

Answer: 5- Ondansetron

Ondansetron is a potent 5HT₃-receptor antagonist.

It is an especially useful antiemetic when nausea results from a massive release of serotonin (5HT) from enterochromaffin cells (for example, post-chemotherapy).

Certain chemotherapy agents (for example, cisplatin) have a high 'emesis risk' and treatment with ondansetron or other related drugs is essential.

In the United Kingdom 5HT₃ antagonists are licensed only for post-chemotherapy and post-operative nausea.



[Q: 4463] OnExamination 2012 - Misc

A 45-year-old with a history of renal cell carcinoma presents to his local Emergency department with a brief history of lethargy. He recently underwent a cycle of chemotherapy.

You take a full history and examine the patient. Following this you arrange a set of blood tests. Half an hour later you are phoned by the biochemistry laboratory and informed your patient's creatinine is 232. You check his previous results and note his creatinine for four weeks ago was 87. He is on several medications for pain and nausea.

Which of these medications should be avoided in this situation?

- 1- Cyclizine
- 2- Fentanyl
- 3- Haloperidol

- 4- Morphine
5- Paracetamol

Answer & Comments

Answer: 4- Morphine

Morphine has active metabolites which accumulate with renal impairment and can lead to opioid toxicity. Morphine should therefore be avoided in this situation.

Fentanyl is a good alternative in this situation as the same problem does not occur.

Cyclizine, haloperidol and paracetamol can all be used in renal impairment but the dose should be altered and patient monitored for side effects.



[Q: 4464] OnExamination 2012 - Misc

A 63-year-old patient with prostate cancer presents with constipation.

He was diagnosed with prostate cancer after a biopsy four months ago. Following various investigations he was diagnosed with local and distant metastases. Despite this he has remained relatively well and is able to live independently.

He has not opened his bowels for three days and has been feeling generally tired.

What is the most appropriate next step?

- 1- Blood tests, including bone profile
- 2- IV fluids
- 3- Laxatives orally
- 4- Refer to surgeons
- 5- Stop opioid

Answer & Comments

Answer: 1- Blood tests, including bone profile

Hypercalcaemia is a common problem in palliative care. It is more common in certain cancers and prostate cancer with bone

metastasis (as suggested in this scenario) is a frequent cause.

Hypercalcaemia can cause a wide variety of symptoms including constipation.

Of the options all are potentially appropriate, depending on the patient, but if there is a high likelihood of hypercalcaemia, this should be ruled out first.



[Q: 4465] OnExamination 2012 - Misc

A 48-year-old man is diagnosed with renal cell carcinoma. He presents to his local palliative medicine service with constipation.

His drug list includes morphine sulphate modified release, 40 mg twice a day.

He is assessed for the cause of his constipation and given advice on fluid intake and diet. Alongside these measures he is started on a laxative.

What would be the most appropriate initial laxative?

- 1- Docusate
- 2- Fybogel
- 3- Lactulose
- 4- Movicol
- 5- Senna

Answer & Comments

Answer: 5- Senna

Ninety per cent of patients taking morphine require a laxative.

Morphine causes constipation by enhancing intestinal ring contractions which leads to hypersegmentation which in turn impairs peristalsis.

A stimulant ('contact', 'large bowel') laxative therefore is the most logical choice for this indication. Senna is the most commonly used

laxative for this indication. Other options include danthron.

Docusate is a stool softener, Fybogel a bulk-forming agent, lactulose and Movicol are osmotic laxatives.



[Q: 4466] OnExamination 2012 - Misc

A 78-year-old woman has been diagnosed with multiple myeloma.

She has been suffering severe bone pain and has been having problems with constipation. She was started on increasing doses of slow release morphine.

Which of the following explains the mechanism of morphine-induced constipation?

- 1- Anorexia
- 2- Dehydration
- 3- Enhanced intestinal ring contractions
- 4- Nausea
- 5- Reduced bowel secretions

Answer & Comments

Answer: 3- Enhanced intestinal ring contractions

Morphine causes constipation by enhancing intestinal ring contractions. This results in hypersegmentation which in turn impairs peristalsis.

Dehydration and anorexia will also contribute but these are not the main mechanism.

Hence enhanced intestinal ring contractions is the correct answer.

Ninety per cent of patients taking morphine require a laxative and a stimulant is the best choice (such as senna).



[Q: 4467] OnExamination 2012 - Misc

A 53-year-old woman with lung cancer and secondary spine metastasis presents with severe leg pain.

She has been treated according to the WHO analgesic ladder and is currently taking morphine modified release. However despite increasing doses, her pain is not well controlled. She has also tried amitriptyline which has not helped.

You ask the local palliative medicine consultant for advice and she suggests starting gabapentin.

Choose the response which most appropriately describes the recognised primary pathway on which gabapentin is thought to work for its role in the management of neuropathic pain.

- 1- Activation of GABA inhibitory system
- 2- Enhanced descending inhibition
- 3- Inhibition of glutamate excitatory system
- 4- None of the above
- 5- Sodium channel blockade

Answer & Comments

Answer: 3- Inhibition of glutamate excitatory system

Gabapentin is a commonly used adjunctive agent for neuropathic pain. Its mechanism of action is by inhibition of glutamate excitatory neurones.

It is the only drug licensed for all types of neuropathic pain and is useful in malignant and non-malignant pain.

Four to six weeks of treatment are often needed before the patient experiences benefit.

The remaining options are pathways altered by other commonly used neuropathic agents.



[Q: 4468] OnExamination 2012 - Misc

A 67-year-old man with a history of metastatic lung cancer complains of lateral chest wall pain.

You review his notes and radiological investigations and note he has been diagnosed with lung cancer with metastatic deposits in his ribs. You take a full history and examine the patient; he complains of pain which radiates from his right lateral chest wall around to his sternum.

You think this patient's pain is a result of nerve damage and wish to start analgesia.

Which of the following is the most appropriate choice to try first in this situation?

- 1- Amitriptyline
- 2- Carbamazepine
- 3- Gabapentin
- 4- Ibuprofen and tramadol
- 5- Morphine

Answer & Comments

Answer: 4- Ibuprofen and tramadol

Nerve pain is a common problem in palliative care and can be difficult to manage.

Nerve pain often has a nociceptive opioid responsive element and hence opioids (with a combination of nonsteroidal anti-inflammatory drugs [NSAIDs]) should be tried first, and used as part of the WHO analgesic ladder.

Thus, ibuprofen and tramadol are the correct answer and not morphine.

Morphine would be tried next and then the other agents.



[Q: 4469] OnExamination 2012 - Misc

Which of the following drugs should not be prescribed for a breast-feeding mother?

- 1- Digoxin
- 2- Erythromycin
- 3- Tetracycline
- 4- Theophylline
- 5- Warfarin

Answer & Comments

Answer: 3- Tetracycline

Tetracycline should be avoided in breast-feeding mothers because of staining of the infant's teeth.

Other drugs to be avoided include amiodarone, lithium, chloramphenicol and vitamin A derivatives.



[Q: 4470] OnExamination 2012 - Misc

A 35-year-old gentleman with well controlled rheumatoid arthritis has, with his wife, been trying to conceive for 18 months. He and his wife visit you in fertility clinic.

What is the likely cause of their problem?

- 1- Chloroquine
- 2- Chronic illness reducing fertility
- 3- Leflunomide
- 4- Methotrexate
- 5- Reduced fertility due to female pelvic inflammatory disease

Answer & Comments

Answer: 3- Leflunomide

Leflunomide reduces sperm count.

Chronic illness can affect fertility; however in this case the gentleman's rheumatoid arthritis

is well controlled and therefore should not be a barrier to conception.

Chloroquine is safe in pregnancy and does not affect fertility. Its side effects include gastrointestinal disturbances and headaches.

Methotrexate does not affect fertility but should be avoided in pregnancy. Its more serious side effects are bone marrow suppression and hepatotoxicity, hence blood monitoring required.

Female related problems are the most common cause of infertility, especially pelvic inflammatory disease, secondary to infection. However in this case a good drug history will point to other causes.



[Q: 4471] OnExamination 2012 - Misc

A 22-year-old woman has come to the clinic complaining that she has had no periods for the past four months. She was always a normal weight, but has found it difficult to maintain her size since starting intensive training to run a marathon. She takes no regular medication.

On examination her BMI is 18 kg/m². Physical examination, including assessment of secondary sexual characteristics is unremarkable.

Investigations show

Haemoglobin 11.4 g/dl (11.5-16.5)

White cell count 6.9 x 10⁹/L (4-11)

Platelets 203 x 10⁹/L (150-400)

Sodium 140 mmol/l (135-146)

Potassium 4.2 mmol/l (3.5-5)

Creatinine 102 µmol/l (79-118)

Albumin 40 g/l (35-50)

Alanine amino transferase 10 U/l (5-40)

Follicle stimulating hormone 15 IU/l (<20)

Thyroid stimulating hormone 2.5 mU/l (0.5-5.0)

Which of the following is the most likely diagnosis?

1- Autoimmune ovarian failure

2- Pregnancy

3- Prolactinoma

4- Secondary amenorrhoea due to weight loss

5- Thyrotoxicosis

Answer & Comments

Answer: 4- Secondary amenorrhoea due to weight loss

This lady has secondary amenorrhoea, whereby menstruation has previously occurred but has stopped for more than six months. Given she has been intensively training and has a BMI of 18, it seems most likely that she has amenorrhoea related to weight loss.

Weight loss can cause amenorrhoea, especially if rapid, BMI is less than 19 and more than 10% of body weight has been lost. The amenorrhoea is felt to be directly related to weight, but excess endorphin production may also play a part.

FSH is in the normal range, which counts against autoimmune (premature) ovarian failure; we have no signs at all that she is pregnant, and she does not report symptoms consistent with prolactinoma, such as vaginal dryness or breast leakage of milk.

Additionally her TSH is in the normal range, which rules out thyrotoxicosis.



[Q: 4472] OnExamination 2012 - Misc

A 17-year-old primigravida complains of constipation and arthralgia at 28 weeks' gestation.

A number of biochemical investigations are performed, but which of these are clinically significant?

- 1- Detectable urinary human chorionic gonadotrophin
- 2- Free thyroxine 8.9 pmol/l (9-22)
- 3- Prolactin of 1000 mU/l (<450)
- 4- Serum alkaline phosphatase of 350 iu/l (50-110)
- 5- Serum corrected calcium 2.89 mmol/l (2.2-2.6)

Answer & Comments

Answer: 5- Serum corrected calcium 2.89 mmol/l (2.2-2.6)

This patient has symptoms suggestive of hypercalcaemia, which are clinically significant.

Free thyroxine (T4) is at the lower end of the normal range which is often the case in pregnancy and thyroid-stimulating hormone (TSH) is a better guide of thyroid function.

Hyperprolactinaemia is a normal finding in pregnancy, as is detectable urinary human chorionic gonadotrophin.

It is also normal for serum alkaline phosphatase to rise by up to four times normal due to increased placental production.



[Q: 4473] OnExamination 2012 - Misc

A 51-year-old lady enquires about taking hormone replacement therapy (HRT).

Which of the following is the most compelling indication for taking HRT?

- 1- Control of flushing
- 2- Prevent Alzheimer's disease
- 3- Prevent ischaemic heart disease
- 4- Prevent osteoporosis
- 5- Reverse vaginal atrophy

Answer & Comments

Answer: 1- Control of flushing

The indications for HRT have been a matter of great debate over recent years.

Relieving the symptoms of menopause is the most compelling indication.



[Q: 4474] OnExamination 2012 - Misc

A 28-year-old female returns from a trip to Bangladesh with a fever, diarrhoea and rash. She is diagnosed with typhoid fever.

However, she has a 1-month-old infant and wishes to continue to breast feed.

Which of the following antibiotics is the most appropriate therapy for her?

- 1- Ceftriaxone
- 2- Chloramphenicol
- 3- Ciprofloxacin
- 4- Cotrimoxazole
- 5- Gentamicin

Answer & Comments

Answer: 1- Ceftriaxone

Typhoid fever is best treated with quinolones, chloramphenicol or cotrimoxazole.

However, with breast feeding chloramphenicol is relatively contraindicated as are quinolones due to potential risk even if small.

Also cotrimoxazole is safe in breast feeding except with infants less than 2 months due to possible risk of increased bilirubin.

In pregnancy or children the drug of choice is parenteral ceftriaxone.



[Q: 4475] OnExamination 2012 - Misc

A fit and healthy couple present with a three year history of first trimester recurrent miscarriages.

Which of the following tests would be the most appropriate for this couple?

- 1- Maternal and paternal karyotyping
- 2- Maternal oral glucose tolerance test
- 3- Maternal prolactin concentration
- 4- TORCH screen
- 5- Vaginal swabs for bacterial vaginosis

Answer & Comments

Answer: 1- Maternal and paternal karyotyping

Recurrent first trimester miscarriages warrant further investigation which would include karyotyping and assessment for lupus anticoagulant.

Hyperprolactinaemia may cause subfertility rather than miscarriage.

There is no evidence that gestational diabetes per se causes recurrent first trimester miscarriages.

TORCH (toxoplasmosis, other, rubella virus, cytomegalovirus, and herpes simplex) infection would be unlikely to precipitate recurrent miscarriage.

Bacterial vaginosis rather than associated with recurrent early miscarriage is associated with second trimester miscarriage and premature labour.



[Q: 4476] OnExamination 2012 - Misc

A 25-year-old female is diagnosed with polycystic ovarian syndrome and commenced on metformin.

Which of the following are recognised effects of the use of metformin in the treatment of polycystic ovarian syndrome?

- 1- Improves action of vasopressin
- 2- Improves chances of conception
- 3- Increases exercise capacity
- 4- Reduces testosterone concentration
- 5- Reduces weight

Answer & Comments

Answer: 2- Improves chances of conception

Polycystic ovarian syndrome is recognised to be a condition associated with increased insulin resistance and metformin is effective through improvements in insulin sensitivity resulting in ovulation and improvements in hormonal perturbations.

It has been shown to increase rates of conception but has no appreciable effect on weight loss.



[Q: 4477] OnExamination 2012 - Misc

Which of the following should receive treatment with varicella immunoglobulin?

- 1- A non-immune pregnant woman who is exposed to her mother who has shingles
- 2- A pregnant woman non-immune to varicella zoster (VZV) exposed to a child with chicken pox 12 days previously.
- 3- A pregnant woman previously treated with varicella zoster immunoglobulin 10 days ago who has been re-exposed to a case of chicken pox.
- 4- A pregnant woman who has no history of chicken pox but develops shingles in pregnancy
- 5- A pregnant woman with asthma taking steroids, who has had chicken pox as a child but is now exposed to her daughter who has chicken pox.

Answer & Comments

Answer: 1- A non-immune pregnant woman who is exposed to her mother who has shingles

Varicella immunoglobulin is effective if used sufficiently early in patients proven to be non-immune to VZV and in whom exposure to VZV is confirmed.

The beneficial effects may last up to three weeks following initial treatment and beyond this, it can be used again should re-exposure occur.

However, it is still important to check VZV antibodies as subclinical disease may have occurred due to its prior use.

VZV can be given up to 10 days with efficacy following exposure.

For more information on this topic please see the following guideline (RCOG):

<http://www.rcog.org.uk/files/rcog-corp/uploaded-files/GT13ChickenpoxinPregnancy2007.pdf>



[Q: 4478] OnExamination 2012 - Misc

A 31-year-old woman in her third pregnancy is receiving low molecular weight heparin (LMWH) at treatment doses due to a pulmonary embolism three months prior to conception. She is currently at 31 weeks gestation.

All fetal scans have been normal, and her blood pressure is 126/80 mmHg in the left lateral position.

Which of the following statements is correct?

- 1- Breastfeeding is not advised
- 2- Clexane treatment needs no monitoring in pregnancy
- 3- It is safe for her to receive NSAIDs perinatally

4- Prothrombin time is an indicator of anti-factor Xa activity

5- The dose of Clexane should be increased in the third trimester

Answer & Comments

Answer: 2- Clexane treatment needs no monitoring in pregnancy

Neither heparin nor warfarin are contraindications to breastfeeding.

There is no recommendation that the dose of LMWH should be increased in the third trimester.

Increases in prothrombin time and activated clotting time (ACT) are not linearly correlated with increasing LMWH anti-thrombotic activity and therefore are unsuitable and unreliable for monitoring LMWH activity.

Nonsteroidal anti-inflammatory drug (NSAID) treatment increases the risk of haemorrhage in both mother and fetus.

It is not known whether unchanged enoxaparin sodium is excreted in human breast milk. The oral absorption of enoxaparin sodium is unlikely. However, as a precaution, lactating mothers receiving enoxaparin sodium should be advised to avoid breast feeding.

for more information on this topic please see the following link to college guidelines:

<http://www.rcog.org.uk/files/rcog-corp/GTG37aReducingRiskThrombosis.pdf>



[Q: 4479] OnExamination 2012 - Misc

A 34-year-old woman comes to the Emergency department GP complaining of intermenstrual bleeding, particularly after sexual intercourse, pain on intercourse and intermittent severe right iliac fossa pain.

In the last month she was admitted to the Emergency department with suspected appendicitis but later discharged.

On examination she is pyrexial 37.9 C and there is bilateral lower abdominal tenderness. Speculum examination reveals cervicitis and mucopurulent cervical discharge.

Which of the following represents the most appropriate antibiotic regime?

- 1- Cephalexin 500 mg BD and metronidazole 400 mg PO BD for 14 days
- 2- Ceftriaxone 250 mg IM then doxycycline 100 mg BD and metronidazole 400 mg BD for 14 days
- 3- Metronidazole 400 mg PO BD for 7 days
- 4- Metronidazole 400 mg PO BD for 14 days and ciprofloxacin 500 mg BD for 14 days
- 5- Ofloxacin 400 mg BD for 7 days

Answer & Comments

Answer: 2- Ceftriaxone 250 mg IM then doxycycline 100 mg BD and metronidazole 400 mg BD for 14 days

The answer is B, ceftriaxone 250 mg IM then doxycycline 100 mg BD and metronidazole 400 mg BD for 14 days.

This patient has symptoms consistent with pelvic inflammatory disease, which may be sexually transmitted and due either to Chlamydia or gonorrhoea. Antibiotic treatment should not wait for swab or culture results and be commenced once the diagnosis is made.

Referral to a GUM clinic should be considered to arrange screening across the range of possible sexually transmitted infections.

Long term sequelae include possible tubal scarring and subfertility.



[Q: 4480] OnExamination 2012 - Misc

A 32-year-old woman presents to the clinic in a very distressed state.

She is 35 weeks pregnant with her first child. Apparently she has developed a crop of herpetic ulcers over her vulva and on further questioning her husband admitted to unprotected sex with a prostitute during a business trip. The ulcers are confirmed as containing herpes simplex virus and serology suggests that this is a primary infection.

Which of the following represents the correct management with respect to the delivery of her child?

- 1- Aciclovir cover is not recommended in any circumstances for the mother during delivery
- 2- Aciclovir is not recommended in any circumstances for the infant during the post partum period
- 3- She can be left to make up her mind about the mode of delivery
- 4- She should have a caesarean section
- 5- She should have a vaginal delivery

Answer & Comments

Answer: 4- She should have a caesarean section

The answer is D, she should have a caesarean section.

RCOG guidance is clear that when primary herpes infection occurs within six weeks of expected delivery, then caesarean delivery is the recommended course of action.

Additionally, IV aciclovir cover for mother and infant during the peri-partum period is recommended if a vaginal delivery should occur. If vaginal delivery occurs in the absence of aciclovir cover, an analysis of five available studies suggest that the neonatal infection rate may be up to 41%.



[Q: 4481] OnExamination 2012 - Misc

A 32-year-old woman comes to her 20 week visit in her first pregnancy.

You are asked to review her as she is hypertensive, with a BP of 162/102 mmHg. Her BP at booking was also elevated at 141/91 mmHg. She has no significant past medical history of note apart from having consulted the practice nurse at the surgery for weight loss counselling over the past few years.

On examination she looks well, physical examination being consistent with a 20 week pregnancy.

Investigations show

Haemoglobin 11.0 g/dl(11.5-16)

White cell count $5.1 \times 10^9/L$ (4-10)

Platelets $189 \times 10^9/L$ (150-400)

Sodium 140 mmol/l (134-143)

Potassium 4.2 mmol/l (3.5-5)

Creatinine 89 $\mu\text{mol/l}$ (60-120)

Glucose 5.0 mmol/l (<6.0)

Urine Blood and protein negative

Which of the following is the most appropriate anti-hypertensive medication for her?

- 1- Atenolol
- 2- Hydrochlorothiazide
- 3- Methyldopa
- 4- Ramipril
- 5- Valsartan

Answer & Comments

Answer: 3- Methyldopa

Methyldopa is the treatment of choice for hypertension in pregnancy, as it has the largest evidence base for use.

Labetalol (alpha- and β -blocker) is the most commonly used second line agent, with dihydropyridines the usual choice for patients who fail to tolerate these agents.

Angiotensin converting enzyme (ACE) inhibitors or angiotensin receptor blockers (ARBs) are not recommended for use in pregnancy because of concerns about teratogenicity, particularly with respect to abnormalities of the renal tract (second/third trimester) cardiovascular and neurological (first trimester).

As such, patients who are using ARBs or ACE inhibitors should change their medication prior even to trying to get pregnant.



[Q: 4482] OnExamination 2012 - Misc

A 50-year-old female presents with concerns related to reduced libido.

This has been causing problems with her husband as she does not feel like sex at all and she feels rather down.

In her past history she has had ovarian failure associated with a hysterectomy three years ago and is being treated with oestradiol 2 mg daily.

Which of the following would be the most appropriate treatment for this patient?

- 1- Add fluoxetine
- 2- Add norethisterone
- 3- Add testosterone patch
- 4- Increase dose of oestrogen
- 5- Use vaginal oestrogen gel

Answer & Comments

Answer: 3- Add testosterone patch

Hypoactive sexual desire disorder is well recognised in post-menopausal females as well as in patients following ovarian failure.

This may not improve despite adequate oestrogen replacement therapy as in this case and testosterone patches have been demonstrated to improve desire, activity and reduce distress.

Progestagens are not required in hysterectomised subjects and may cause a deterioration in symptoms.



[Q: 4483] OnExamination 2012 - Misc

A 26-year-old woman who is 12 weeks pregnant, presents with a concern after being exposed to her mother who has been diagnosed with facial shingles one day ago.

She was unaware of what the rash was and had examined the rash closely two days ago before her mother was diagnosed. She informs you that she is unaware of ever having chicken pox.

Which of the following is the most appropriate action that should be taken for this patient?

- 1- She should be reassured that she will not contract Varicella zoster from her mother.
- 2- She should be tested immediately for IgG antibodies to Varicella zoster
- 3- She should be treated with Varicella zoster immunoglobulin
- 4- She should immediately receive Varicella zoster vaccine
- 5- She should receive treatment immediately with aciclovir

Answer & Comments

Answer: 2- She should be tested immediately for IgG antibodies to Varicella zoster

The patient gives a very good history of exposure to Varicella zoster virus (VZV) and it is possible for her to acquire chicken pox if she is non-immune.

However, she may well have had VZV infection as a child and the most important action is first to measure IgG antibodies to VZV. If these are present no further action need be taken and the patient relatively reassured.

If she is non-immune then the patient will probably need to be treated with VZ immunoglobulin which has been shown to reduce severity and possible fetal infection.



[Q: 4484] OnExamination 2012 - Misc

An 18-year-old Asian girl was found to be pregnant after missing her last menstrual period despite her appropriate use of the oral contraceptive pill for the last two years.

She was found also to have been taking additional medication prescribed by a specialist two months ago.

Which of the following accounts for the pill failure?

- 1- Cimetidine
- 2- Erythromycin
- 3- Isoniazid
- 4- Ketoconazole
- 5- Rifampicin

Answer & Comments

Answer: 5- Rifampicin

Rifampicin is a hepatic drug-metabolising enzyme inducer.

Thus it enhances the metabolism of oral contraceptive pills, decreasing its effectiveness and resulting in pill failure.



[Q: 4485] OnExamination 2012 - Misc

Which of the following is the most appropriate anticonvulsant for the treatment of an eclamptic fit?

- 1- Diazepam
- 2- Lorazepam
- 3- Magnesium sulphate.
- 4- Phenytoin
- 5- Thiopentone

Answer & Comments

Answer: 3- Magnesium sulphate.

Refer to the important conclusions of the Collaborative Eclampsia Trial and the Cochrane Review by Duley and Gulmezoglu.



[Q: 4486] OnExamination 2012 - Misc

A 29-year-old woman is receiving subcutaneous Clexane (low-molecular weight heparin [LMWH]) for the treatment of pulmonary embolism. She is 30 weeks pregnant and develops bruising on her lower arms.

The blood pressure in the left lateral position is 125/75 mmHg.

What is the most appropriate test for this patient?

- 1- Anti factor Xa levels
- 2- APTT
- 3- Platelet count
- 4- Serum albumin
- 5- Serum potassium

Answer & Comments

Answer: 3- Platelet count

This is likely to be heparin-induced thrombocytopenia (HIT).

Long term LMWH treatment has been associated with low platelet counts and this is the test which is likely to provide you with the most information.

Clexane may cause hyperkalaemia, but this is unlikely to cause bruising.

Albumin levels may increase in pregnancy but serum albumin may be low due to haemodilution.

Activated partial thromboplastin time (APTT) is not useful in monitoring LMWH activity, although APTT may be prolonged in high dose Clexane treatment.

Factor Xa levels can be used to monitor efficacy of treatment but the suggestion of bruising here points more to HIT for which Xa levels would not be a useful guide.



[Q: 4487] OnExamination 2012 - Misc

A 29-year-old female who is 22 weeks pregnant is noted to have a blood pressure of 150/90 mmHg on three separate occasions.

Urine protein is negative.

Which of the following would be the first line treatment?

- 1- Alpha methyl dopa
- 2- Atenolol
- 3- Magnesium sulphate
- 4- Nifedipine
- 5- Salbutamol

Answer & Comments

Answer: 1- Alpha methyl dopa

Beta blockers are safe in the third trimester of pregnancy but are generally not used due to fears of intrauterine growth retardation (IUGR).

Generally one would favour labetalol in these circumstances given that there is an evidence base for its use.

Magnesium sulphate is a recognised treatment for pre-eclampsia, a condition which is not described here.

Nifedipine may be used by experienced clinicians but is currently unlicensed for this use.

There is good evidence that methyldopa is effective and safe for both mother and baby in pregnancy.



[Q: 4488] OnExamination 2012 - Misc

A 67-year-old man presents after having a urine tract infection treated and has read in a magazine that maybe it would be worth checking a PSA.

When should his PSA be checked?

- 1- Check in three days' time
- 2- Check in one week
- 3- Check in two weeks
- 4- Check on this occasion
- 5- No need to check PSA

Answer & Comments

Answer: 3- Check in two weeks

Prostate-specific antigen (PSA) concentrations can rise with problems of false positives after catheterisation and particularly urinary tract infections (UTI).

Therefore, if one has decided to check a PSA then it is recommended that this should be measured at least two weeks after a treated UTI.



[Q: 4489] OnExamination 2012 - Misc

A 56-year-old man who has presented with chest pain, has a PSA of 45 ng/ml (normal less than 4).

Which of the following statements is correct with respect to this patient's management?

- 1- An elevated PSA is a definitive test for prostate cancer

- 2- High selenium intake is related to prostate cancer
- 3- Prostate cancer is more aggressive with increasing age
- 4- Prostate cancer is typically squamous cell carcinoma
- 5- The most commonly used pathological grading system is the Gleason score

Answer & Comments

Answer: 5- The most commonly used pathological grading system is the Gleason score

Prostate-specific antigen (PSA) may be elevated in prostatitis, benign prostatic hyperplasia and prostate cancer.

High intake of animal fats is related to prostate cancer, as well as low intake of selenium.

As a rule, prostate cancer is more aggressive in younger men.

Prostate cancer is an adenocarcinoma.

The Gleason score is recommended by the American College of Pathologists. The most well differentiated tumours have a Gleason score of 2, and the most poorly differentiated a Gleason score of 10.



[Q: 4490] OnExamination 2012 - Misc

Which one of the following cutaneous lesions is associated with HIV infection?

- 1- Leucoplakia
- 2- Lichen planus
- 3- Lichen sclerosus
- 4- Plasma cell balanitis
- 5- Psoriasis

Answer & Comments

Answer: 5- Psoriasis

It occurs in 2-4% of healthy people. If pre-existing psoriasis flares up for no apparent reason or middle-aged people develop psoriasis for the first time, one should exclude underlying HIV infection in those patients.

Leucoplakia is a pre-cancerous lesion whereas oral hairy leucoplakia is a sign of immunodeficiency in an HIV positive patient.

Lichen planus, lichen sclerosus and plasma cell balanitis are not associated with HIV infection.



[Q: 4491] OnExamination 2012 - Misc

Which one of the following is an AIDS defining illness?

- 1- Anal canal warts
- 2- Extra genital molluscum contagiosum
- 3- Multidermatomal shingles
- 4- Oesophageal candidiasis
- 5- Oral candidiasis

Answer & Comments

Answer: 4- Oesophageal candidiasis

Any opportunistic infections or opportunistic malignancies are AIDS defining illnesses.

Oesophageal candidiasis is an AIDS defining illness but oral candidiasis is not.

Anal warts are not an opportunistic infection.

Extra genital molluscum contagiosum is also not an opportunistic infection but frequently occurs in symptomatic HIV positive patients.

Multidermatomal shingles is not an opportunistic infection but if it occurs in a young person HIV infection needs to be excluded.



[Q: 4492] OnExamination 2012 - Misc

A 28-year-old man with HIV presents with a five day history of feeling unwell. He is a heavy smoker.

A chest radiograph showed right upper lobe consolidation. His CD4 count was 468 cells/mm³. HIV RNA level was 90,678 copies/ml. He is not on any antiretroviral treatment.

What is the most likely diagnosis?

- 1- Bronchial carcinoma
- 2- Invasive pulmonary aspergillosis
- 3- Pulmonary tuberculosis
- 4- Pneumocystis jiroveci pneumonia (PCP)
- 5- Streptococcal pneumonia

Answer & Comments

Answer: 5- Streptococcal pneumonia

This is typical of community-acquired pneumonia. One should think of common infections rather than any opportunistic infections in HIV patients with good CD4 counts. (More than 400 cells/mm³ is not immunocompromised.)

It is not a typical history for bronchial carcinoma as the history was short and radiographic changes were not typical of bronchial carcinoma.

Invasive pulmonary aspergillosis is unlikely in a patient with good CD4 count. Pulmonary tuberculosis typically causes cavitating lesions in a patient with a good CD4 count.

PCP commonly occurs in patients with CD4 count of less than 200 cells/mm³ and chest radiograph shows bilateral infiltrates from the hila without any effusion or lymphadenopathy.



[Q: 4493] OnExamination 2012 - Misc

Which one of the following is an oncogenic virus?

- 1- Hepatitis A
- 2- Human papilloma virus 6 (HPV 6)
- 3- Human papilloma virus 11 (HPV 11)
- 4- Human papilloma virus 16 (HPV 16)
- 5- Varicella zoster virus (VZV)

Answer & Comments

Answer: 4- Human papilloma virus 16 (HPV 16)

HPV 16 is oncogenic and causes squamous cell carcinomas in the oral cavity, cervix, anus and penis.

Hepatitis A is not an oncogenic virus, as it does not cause chronic infection or cancer.

HPV 6 and 11 typically cause the majority of benign warts.

VZV causes chicken pox and herpes zoster.

Reference:

Yoganathan K, Patel RN, Maitland N, McManus TJ, Calman FM, Pozniak A. Carcinoma of the penis in an HIV positive patient. *Genitourin Med.*1995 Feb; 71 (1): 41-2.



[Q: 4494] OnExamination 2012 - Misc

A 34-year-old homosexual Caucasian man developed jaundice two months after taking a combination of antiretroviral drugs.

He admitted that he had had several episodes of unprotected sex with several casual male partners. His liver function showed raised bilirubin with normal transaminases and alkaline phosphatase.

What is the most likely cause of his jaundice?

- 1- Acute hepatitis B
- 2- Alcoholic hepatitis

- 3- Atazanavir
- 4- Efavirenz
- 5- Nevirapine

Answer & Comments

Answer: 3- Atazanavir

Atazanavir causes hyperbilirubinaemia with normal transaminases and alkaline phosphatase (mimicking Gilbert's syndrome).

Acute hepatitis B is unlikely with normal transaminases and alkaline phosphatase.

A mild to moderate rise in transaminases and alkaline phosphatase occurs in alcoholic hepatitis.

Efavirenz can cause acute hepatitis with raised levels of transaminases.

Nevirapine causes acute hepatitis where transaminases are raised several-fold.



[Q: 4495] OnExamination 2012 - Misc

Which of the following is a sign of immunodeficiency in the mouth?

- 1- Gingivitis
- 2- Herpes labialis
- 3- Leucoplakia
- 4- Oral hairy leucoplakia
- 5- Oral wart

Answer & Comments

Answer: 4- Oral hairy leucoplakia

Oral hairy leucoplakia is a sign of immunodeficiency. It is due to reactivation of Epstein-Barr virus infection.

Gingivitis is not a sign of immunodeficiency.

Leucoplakia is not a sign of immunodeficiency but it is a precancerous lesion.

Herpes labialis is due to herpes simplex infection, which causes 'cold sores' in immunocompetent patients and chronic herpes labialis in immunocompromised patients.

Oral warts can occur in healthy people. They are due to HPV infection usually due to benign types, 6 and 11.



[Q: 4496] OnExamination 2012 - Misc

A 32-year-old African woman with HIV presents with a two week history of greenish, frothy, itchy vaginal discharge.

What is the most likely cause of her discharge?

- 1- Candida albicans infection
- 2- Chlamydia infection
- 3- Foreign body
- 4- Gonorrhoea infection
- 5- Trichomonas vaginalis infection

Answer & Comments

Answer: 5- Trichomonas vaginalis infection

Trichomonas vaginalis causes itchy, frothy, greenish vaginal discharge.

Candida albicans causes a white, curdy, itchy vaginal discharge.

Chlamydia and gonorrhoea do not cause itchy, frothy vaginal discharge and both can be asymptomatic.

Foreign body causes foul smelling vaginal discharge.



[Q: 4497] OnExamination 2012 - Misc

A 39-year-old Caucasian man with symptomatic HIV disease developed multiple painless umbilicated papular lesions on his face.

What is the most likely cause of his skin lesions?

- 1- Cytomegalovirus (CMV)
- 2- Epstein Barr virus (EBV)
- 3- Human herpes virus (HHV) 8
- 4- Human papilloma virus (HPV 16)
- 5- Pox virus

Answer & Comments

Answer: 5- Pox virus

Multiple painless umbilicated papular lesions are typical of molluscum contagiosum and are caused by pox virus.

CMV does not cause painless papular lesions.

EBV causes Burkitt's lymphoma, non-Hodgkin's lymphoma and primary brain lymphomas.

HHV 8 is strongly associated with Kaposi's sarcoma.

HPV 16 is associated with squamous cell carcinomas in cervix, penis, anus and oral cavity.

Reference:

Bain S, Yoganathan K. *Physical Signs for the General Practitioner. Case 51. Molluscum contagiosum. Dental update. 2008; 68.*

Yoganathan K, Patel RN, Maitland N, McManus TJ, Calman FM, Pozniak A. *Carcinoma of the penis in a HIV positive patient. Genitourin Med. 1995 Feb; 71 (1): 41-2.*



[Q: 4498] OnExamination 2012 - Misc

A 46-year-old homosexual HIV positive man presents with a two week history of weakness of his right arm and leg.

Examination reveals right hemiparesis and left cerebellar signs. CT scan shows white matter lesions in the left cerebellar region and left temporoparietal area. There is no midline shift or surrounding oedema.

Which one of the following is most likely to be found in his cerebrospinal fluid (CSF)?

- 1- Positive cytomegalovirus (CMV) PCR
- 2- Positive Epstein-Barr virus (EBV) PCR
- 3- Positive herpes simplex virus (HSV) PCR
- 4- Positive human herpes virus (HHV) 8 PCR
- 5- Positive JC PCR

Answer & Comments

Answer: 5- Positive JC PCR

Multifocal lesions in left cerebellar and temporoparietal white matter areas without any mass effect or surrounding oedema are most likely to be due to progressive multifocal leucoencephalopathy (PML).

JC virus causes PML in immunocompromised patients especially when the CD4 count is below 100 cells/mm³.

CMV polymerase chain reaction (PCR) may be found in CMV encephalitis. It is clinically not a typical feature of CMV encephalitis.

Positive EBV PCR indicates primary brain lymphoma where CT scan often shows significant mass effect with surrounding oedema.

HSV PCR may be found in HSV encephalitis which commonly affects temporal lobes in patients with good CD4 count.

HHV 8 PCR is usually associated with Kaposi's sarcoma.



[Q: 4499] OnExamination 2012 - Misc

A 54-year-old woman is referred to the chest clinic by the GP with a history of a non-productive cough. She is severely troubled by her symptoms often waking at night. She is a smoker with a 25-pack year history.

According to the current British Thoracic Society guidelines, at least how long must

symptoms be present to be defined as a chronic cough and investigated as such?

- 1- 3 weeks
- 2- 4 weeks
- 3- 8 weeks
- 4- 3 months
- 5- 4 months

Answer & Comments

Answer: 3- 8 weeks

In epidemiological studies 16% of the United Kingdom population reported a persistent cough.

For the purposes of the BTS guidelines, cough is a forced expulsive manoeuvre against a closed glottis with a characteristic sound.

Acute cough is defined as one lasting less than three weeks. A chronic cough is defined as one lasting over eight weeks. There is a grey area between three to eight weeks and this includes post-viral coughs.

There are several serious conditions that may present with an isolated cough including neoplasm, infection (for example, TB), and interstitial lung disease.

In those with a normal chest x ray, reflux disease, asthma syndromes and rhinitis should be considered.

British Thoracic Society guidelines.



[Q: 4500] OnExamination 2012 - Misc

A 45-year-old lady with a history of depression presented to the Emergency department drowsy.

Her repeat prescription says she is taking diazepam and dosulepin, and the ambulance crew say that she has taken an overdose of her medication. Her BP is 140/80 mmHg,

pulse 130 bpm, respiratory rate 7 per minute and O₂ sats 98% on air.

Which of the following is the most appropriate next action?

- 1- Give flumazenil
- 2- Give naloxone
- 3- Obtain an ECG
- 4- Refer for urgent haemodialysis
- 5- Start N-acetylcysteine infusion

Answer & Comments

Answer: 3- Obtain an ECG

This is a tricky case and will catch those who go for the first answer they see that is reasonable.

The urge is quickly to treat the drowsy patient with respiratory depression with some sort of antidote, but there needs to be a diagnostic step first.

Tricyclic antidepressants can cause fatal arrhythmias and seizures which are very difficult to manage.

An electrocardiogram (ECG) would immediately indicate if there is a risk of significant tricyclic toxicity by showing a wide QRS complex or abnormal axis deviation.



[Q: 4501] OnExamination 2012 - Misc

A cohort study of 7,500 patients aimed to find out whether the use of olive oil in cooking has an impact on cardiovascular disease.

Approximately half the patients used olive oil in cooking and half used animal fat.

Which of these is a disadvantage of a cohort study?

- 1- It is not possible to measure the incidence/risk of a disease
- 2- They are not suitable when exposure to risk factors is rare

- 3- They are susceptible to recall bias; there is a differential ability of patients to remember exposure to a risk factor
- 4- They can only provide information about one outcome
- 5- When the outcome of interest is rare a very large sample size is needed.

Answer & Comments

Answer: 5- When the outcome of interest is rare a very large sample size is needed.

A cohort study takes a group of individuals and follows them for a period of time, the aim being to study whether the exposure to a particular aetiological factor has any effect on the incidence of disease.

As such they are relatively time consuming and expensive to perform. Advantages include being able to study exposure factors that are rare and being less susceptible to recall bias than case-control studies.

They are also able to measure the incidence/risk of a disease.

Results are usually expressed as the relative risk of developing the disease given exposure to the aetiological factor.



[Q: 4502] OnExamination 2012 - Misc

A 32-year-old man is referred to the dyslipidaemia clinic for markedly elevated plasma triglycerides.

As measured by his GP they were elevated at 6.5 mmol/l.

On clinical examination which of the following signs is most consistent with isolated hypertriglyceridaemia?

- 1- Corneal arcus
- 2- Kayser-Fleischer rings
- 3- Lipaemia retinalis
- 4- Xanthelasma

5- Xanthochromia

Answer & Comments

Answer: 3- Lipaemia retinalis

The answer is option C, lipaemia retinalis.

Lipaemia retinalis is an association between hypertriglyceridaemia and a pale pink milky appearance to the retinal vessels or even to the retina itself.

Xanthelasma and corneal arcus are associated with hypercholesterolaemia, and xanthochromia is yellowing of the vision.

Kayser-Fleischer rings are associated with Wilson's disease.

Triglycerides themselves are noted as a cardiovascular risk factor both in epidemiological and interventional studies.



[Q: 4503] OnExamination 2012 - Misc

Regarding the epidemiology of infections, which of the following statements is true?

- 1- Diphtheria has been eradicated in most parts of the world.
- 2- Polio has been eradicated in most parts of the world.
- 3- Resistant vivax malaria is a major problem in Kenya.
- 4- Tetanus has been eradicated in most parts of the world.
- 5- The AIDS epidemic seems to be declining worldwide.

Answer & Comments

Answer: 2- Polio has been eradicated in most parts of the world.

Falciparum is the major resistance problem in sub-Saharan Africa.

Most vivax is chloroquine sensitive, though resistant strains are appearing in New Guinea and Indonesia.

Diphtheria is still prevalent in many parts of the world.

An upsurge in polio is now nearing eradication.

Tetanus is still common.

AIDS is increasing inexorably.



[Q: 4504] OnExamination 2012 - Misc

An 85-year-old patient presents with recurrent falls and a fracture of the distal ulna.

Which of the following statements is correct?

- 1- Bone fractures attributable to vitamin D deficiency are due to bone density
- 2- Low vitamin D levels are not associated with muscle weakness
- 3- The toxic levels of vitamin D occur at approximately twice the therapeutic dose
- 4- Vitamin D deficiency in the elderly is rare
- 5- Vitamin D replacement reduces the incidence of fractures in the elderly

Answer & Comments

Answer: 5- Vitamin D replacement reduces the incidence of fractures in the elderly

The clue is in the question.

Vitamin D deficiency in the elderly is common, especially in the housebound and those in residential and nursing homes, with an overall frequency of 17% in women aged 85 and over.

Vitamin D deficiency is associated with muscle weakness, as well as osteomalacia, and fractures among elderly people with vitamin D deficiency are often not attributable to reduced bone density.

Vitamin D replacement (800 IU daily) with calcium, has been shown to reduce falls and fractures by 47% compared with controls who received calcium only.

The correct dose of vitamin D replacement should be 800 IU.

Lowest doses at which adverse events have been observed with vitamin D replacement are 200 nmol/l, which equates to a daily dose of 40,000 IU.

BMJ 2005;330:524-6.



[Q: 4505] OnExamination 2012 - Misc

A 22-year-old female presents with a month history of episodic, brief visual loss affecting the right eye.

Over the last one year she had gained a considerable amount of weight. Examination reveals a BMI of 35, with bilateral optic disc swelling, worse on the right and small retinal haemorrhages on the right.

What is the most likely diagnosis?

- 1- Benign intracranial hypertension (BIH)
- 2- Craniopharyngioma
- 3- Graves' ophthalmopathy
- 4- Optic neuritis
- 5- Sagittal sinus thrombosis

Answer & Comments

Answer: 1- Benign intracranial hypertension (BIH)

This is a classic description of BIH.

Drugs such as tetracyclines, the oral contraceptive or pregnancy may be contributory.



[Q: 4506] OnExamination 2012 - Misc

Following a road traffic accident, a patient is

brought by ambulance to the Emergency department.

The primary survey reveals an open fracture of the right femur, which is bleeding profusely.

In terms of his cardiovascular physiology, what is the likely response to this blood loss?

- 1- Cardiac output is increased because of increased stroke volume and decreased heart rate
- 2- Heart rate is increased because of increased vagal stimulation of the sinoatrial node
- 3- Stroke volume is decreased because of hypovolaemia
- 4- Total peripheral resistance is increased due to a decreased sympathetic output
- 5- Venous return is increased because of decreased sympathetic output to the venous system

Answer & Comments

Answer: 3- Stroke volume is decreased because of hypovolaemia

The compensation mechanisms to sudden hypovolaemia include:

Cardiac output (CO) can increase, decrease, or stay the same ($CO = HR \times SV$). In this clinical scenario, it is likely that HR will increase, but stroke volume may decrease due to the hypovolaemia.

Heart rate (HR) can increase due to decreased (parasympathetic) vagal stimulation and enhanced sympathetic stimulation with adrenaline.

Total peripheral resistance can increase due to increased sympathetic drive. This causes peripheral vasoconstriction and preserves blood flow to essential organs, such as the brain, heart and kidneys.

Venous return increases if sympathetic output increases, and this is related to the peripheral vasoconstriction. Less blood can pool in the peripheral vessels so it is transported back to the central circulation quickly. This increases venous return and maximises stroke volume.



[Q: 4507] OnExamination 2012 - Misc

A 62-year-old woman presents with a one year history of worsening bilateral, anterior knee pain. The pain is increased by climbing stairs. Both knees are stiff for five to 10 minutes in morning. There is no history of knee swelling. The pain is partially controlled by paracetamol 1 g up to four times a day. She has a history of diabetes, and angina.

On examination, she is overweight. There is crepitus and during active and passive movement of both knees. There is no knee effusion. A recent knee x ray shows joint space narrowing in the medial tibio-femoral joint.

What is the next step in her management?

- 1- Acupuncture
- 2- Oral NSAIDs
- 3- Rest
- 4- Topical NSAIDs
- 5- Transcutaneous electrical nerve stimulation (TENS)

Answer & Comments

Answer: 4- Topical NSAIDs

This lady has osteoarthritis.

NICE guidelines recommend formulating individualised management plans for patients with osteoarthritis.

Behavioural change, such as exercise, weight loss and suitable footwear should be encouraged. Comorbidities which compound

the effect of osteoarthritis symptoms should be identified and their treatment optimised.

Paracetamol and/or topical NSAIDs (for knee or hand OA) should be offered before considering oral NSAIDs.

If symptoms are not controlled with the above strategies, oral NSAIDs or COX-2 inhibitors (but not etoricoxib) can be used. A proton pump inhibitor should be co-prescribed. The lowest effective dose should be prescribed for the shortest period possible. If the patient is already taking low-dose aspirin, an alternative analgesic should be considered.

Treatments which are not recommended include rubefacients, intra-articular hyaluronan, electro-acupuncture and chondroitin or glucosamine products.

Adjuvants which can be used include opioid analgesics, topical capsaicin and intra-articular corticosteroids.

Application of heat or cold packs, or TENS, can be considered if other strategies are ineffective. Manipulation and stretching can be helpful, particularly for hip osteoarthritis. Bracing/joint supports can be used for patients with biomechanical joint pain or instability.

Patients should be referred for joint surgery if they have already been offered all of the core treatments or if they have refractory joint symptoms which have a substantial impact on their quality of life.

If there is a clear history of mechanical locking, referral for arthroscopic lavage and debridement should be considered.



[Q: 4508] OnExamination 2012 - Misc

A 52-year-old man returns for repeat endoscopy. He was last scoped some six months earlier after persistent indigestion, upon which both duodenal ulceration and

Helicobacter was found. He underwent eradication therapy, but has been suffering worse indigestion, particularly over the past four to six weeks.

On examination his BP is 132/72 mmHg, his pulse is 70 and regular. He has mild epigastric tenderness.

Investigations show

Haemoglobin 10.9 g/dl(13.5-17.7)

White cell count $7.2 \times 10^9/L$ (4-11)

Platelets $240 \times 10^9/L$ (150-400)

Serum Sodium 143 mmol/l (135-146)

Serum Potassium 4.0 mmol/l (3.5-5)

Creatinine 110 $\mu\text{mol/l}$ (79-118)

Serum gastrin 850 pg/ml(<200)

Repeat endoscopy: extensive duodenal ulceration.

Which of the following is the most appropriate next step in his management?

- 1- Calcium stimulation test
- 2- CT abdomen
- 3- Omeprazole 40 mg
- 4- Partial gastrectomy
- 5- Secretin stimulation test

Answer & Comments

Answer: 5- Secretin stimulation test

This patient's gastrin is moderately elevated, levels above 1,000 are strongly indicative of a gastrinoma. Unless there is concomitant high dose PPI therapy, at a level of 850 this patient should be subject to stimulation testing.

Secretin is the first choice, and a rise of greater than 200 is a pointer towards a gastrinoma as the underlying diagnosis. It would be sensible to perform the secretin first, prior to attempting pancreatic imaging.

He should not be committed to high dose PPI therapy until gastrinoma has been ruled out.



[Q: 4509] OnExamination 2012 - Misc

A 52-year-old Afro-Caribbean gentleman is diagnosed with hypertension after having three blood pressure measurements greater than 160/100 mmHg.

On examination his BMI is 24, and he looks well. There is no significant past medical history of note.

According to the NICE guidelines, which of the following is the most appropriate to prescribe first line for this patient?

- 1- Amlodipine
- 2- Atenolol
- 3- Diltiazem
- 4- Ramipril
- 5- Valsartan

Answer & Comments

Answer: 1- Amlodipine

Patients of African origin are more likely to have low renin hypertension. This means that they are more likely to respond to initial therapy with either a calcium antagonist or diuretic, usually a thiazide.

Thiazides and beta blockers have been implicated in a meta-analysis as being associated with increased risk of developing insulin resistance, but given his BMI is in the normal range this is unlikely to be a significant problem.

In contrast those patients of Caucasian origin who tend to have higher levels of renin respond much more readily to angiotensin-converting enzyme (ACE) inhibition, or if they fail to tolerate an ACE inhibitor because of cough, to an angiotensin receptor blocker. For these patients, ACE inhibition is seen by NICE as the first line treatment.

Combination therapies were designed originally around the ABCD guidelines from

the British Hypertension Society, but because of the analysis which suggested increased risk of diabetes when beta blockade is combined with a thiazide, the combination of these two is no longer recommended.

Following the ASCOT study however, the ACE inhibitor calcium antagonist combination has been the one preferred by many clinicians.

Reference:

<http://www.nice.org.uk/nicemedia/pdf/CG34fullguideline.pdf>



[Q: 4510] OnExamination 2012 - Misc

Which of the following statements is the principal argument made by proponents of making commerce in human organs for legal use?

- 1- A person's heirs have the right to earn money by selling the deceased's organs.
- 2- Commercialisation is not ethically preferable to the gift model of organ donation.
- 3- It is an ethical trade in a capitalistic society
- 4- Shortages or surpluses would be eliminated.
- 5- There is already an active "black market" in transplantable organs.

Answer & Comments

Answer: 4- Shortages or surpluses would be eliminated.

Although particularly controversial the arguments for commercial organ donation suggest that surpluses or deficits in organs would be eliminated and that the current black market in this resource associated with the inherent exploitation of the poor would be resolved.

However it is unethical to exploit live donors in impoverished countries as may happen currently.



[Q: 4511] OnExamination 2012 - Misc

A 45-year-old gentleman has noticed reduced libido for the past two months, since losing his job.

He is having trouble sleeping, often waking early, and has lost weight due to a reduced appetite. His wife reports that he has been more argumentative than normal, especially in the morning when she is leaving for work.

What psychiatric diagnosis does he have?

- 1- Adjustment disorder
- 2- Bipolar disorder
- 3- Depression
- 4- Depressive anxiety neurosis
- 5- Generalised anxiety disorder

Answer & Comments

Answer: 1- Adjustment disorder

Adjustment disorder occurs within three months of an identifiable stressor and lasts six months from the withdrawal of the stressor. The patient will show either distress in excess of that expected or a disruption of their day to day life.

The criteria for diagnosing generalised anxiety disorder are anxiety/tension, occasionally accompanied by physical symptoms, on more days than not for more than six months. It is more a diagnosis of exclusion however, as it may be due to prescription medication or another psychiatric illness. It is part of the anxiety neuroses.

Anxiety neurosis is a major condition, affecting one in seven Britons.

It includes

Generalised anxiety disorder

Obsessive compulsive disorder

Panic disorder and

Post-traumatic stress.

The neurosis can be defined according to the chief symptom - depression, obsession, anxiety.

Patients show maladaptive psychological symptoms not due to organic cause and out of proportion to the precipitating stress. Underlying psychiatric illness should always be sought, especially depression.

Anxiety disorders can be treated with selective serotonin reuptake inhibitors (SSRIs) or monoamine oxidase inhibitor (MAOI).

Benzodiazepines and beta blockers can be used on a PRN basis for patients who suffer with panic attacks.

Cognitive behavioural therapy can also be of help.

To make a diagnosis of depression symptoms must be present almost everyday for at least two weeks.

Symptoms of depression are those of

Anhedonia (lack of enjoyment in daily life)

Sleeplessness (usually early waking)

Loss of concentration

Loss of appetite and weight loss

Loss of libido

Mood swings (particularly worse in the morning and often associated with feelings of guilt or worthlessness)

Psychomotor retardation or agitation and

Suicidal ideation.

Suicidal thoughts must always be checked for when diagnosing depression, to maintain patient's safety.

Bipolar disorder is depression with episodes of mania.



[Q: 4512] OnExamination 2012 - Misc

A 45-year-old male presents with a longstanding history of hypertension.

Investigations show a urea of 10.2 mmol/L (2.5-7.5) and a creatinine of 150 µmol/L (60-110).

Which one of the following would suggest a diagnosis of acute glomerulonephritis?

- 1- 24 hour urinary protein excretion of 0.8g
- 2- Dyslipidaemia
- 3- RBC casts in urinary sediment
- 4- Shrunken glomeruli on renal biopsy
- 5- Unilaterally smaller kidney

Answer & Comments

Answer: 3- RBC casts in urinary sediment

Casts containing erythrocytes (red cell casts) are an indication of renal bleeding and are typically found when there is acute glomerular inflammation caused by glomerulonephritis or vasculitis.

Answers A, B, D, and E are non-specific and do not suggest an acute glomerulonephritis.



[Q: 4513] OnExamination 2012 - Misc

A 32-year-old female presents with headaches. She has a severe frontal and occipital headache which is present as soon as she wakes in the mornings. She had given birth to a baby boy one month previously and has not been feeling well since.

Examination revealed bilateral blurring of the optic discs with a pupil sparing third nerve palsy on the right.

What is the most likely diagnosis?

- 1- Brainstem CVA
- 2- Herpes simplex encephalitis
- 3- Meningococcal meningitis

- 4- Sagittal sinus thrombosis
5- Sphenoidal wing meningioma

Answer & Comments

Answer: 4- Sagittal sinus thrombosis

Patients with a hypercoagulable state (pregnancy) and papilloedema with neurological signs should be investigated for cerebral venous thrombosis.

Patients may present with a seizure or hysteria and may be mistaken for a psychiatric disorder.

Cranial nerve 3, 4 and 6 involvement suggests a cavernous sinus thrombosis.

Isolated cortical venous sinus thrombosis may give rise to focal neurology.

The diagnosis is made by MRI and the condition may be underdiagnosed.



[Q: 4514] OnExamination 2012 - Misc

A 52-year-old man with a diagnosis as a child of coeliac disease had been asymptomatic despite poor dietary compliance.

He presents with a one month history of intermittent, colicky, central abdominal pain and 3 kilogram weight loss and positive faecal occult bloods.

What is the most appropriate investigation?

- 1- Anti-endomysial antibody.
- 2- Colonoscopy.
- 3- CT scan of abdomen.
- 4- Distal duodenal biopsy.
- 5- Small bowel enema.

Answer & Comments

Answer: 2- Colonoscopy.

New-onset weight loss with positive faecal occult bloods and central abdominal pain in a

52-year-old man must be assumed to be colonic carcinoma until proven otherwise.

Colonoscopy is the best way to check for this and would also demonstrate inflammatory bowel disease if present.

If the colonoscopy were negative, then an OGD would be needed to check for upper gastrointestinal malignancy.



[Q: 4515] OnExamination 2012 - Misc

Depression is seen after damage to which part of the brain?

- 1- Amygdala
- 2- Left frontal
- 3- Left temporal
- 4- Right frontal
- 5- Right temporal

Answer & Comments

Answer: 2- Left frontal

Temporal lobe damage typically causes problems with memory and is the most epileptogenic lobe of the brain.

The amygdala is involved in emotional processing particularly fear.

Bilateral damage can result in the so-called Kluver-Bucy syndrome.



[Q: 4516] OnExamination 2012 - Misc

Functional psychiatric illness rather than an organic brain disorder is suggested by which of the following?

- 1- A family history of major psychiatric illness
- 2- Clouding of consciousness
- 3- Impaired short term memory
- 4- No previous history of psychiatric illness

- 5- Onset for the first time at the age of 55 years

Answer & Comments

Answer: 1- A family history of major psychiatric illness

This question tries to establish typical features of psychiatric disease such as depression/schizophrenia rather than organic brain disease, for example, dementia.

Loss of short term memory and older age are more typical of organic brain disease; however a family history is especially associated with depressive illness and schizophrenia.



[Q: 4517] OnExamination 2012 - Misc

A 26-year-old woman presents with three episodes of collapse over the last nine months. She says that she feels hungry to the pit of her stomach before these episodes occur, sweaty and tremulous.

On examination her BMI is 31, her BP is 142/82 mmHg, pulse is 64. She is obese but there are no other abnormal findings.

Which of the following findings would most point towards an insulinoma?

- 1- Co-existent hypertension
- 2- Co-existent thyroid mass
- 3- Low levels of glucagon
- 4- Weight gain of 5 kg over the past six months
- 5- Weight loss of 5 kg over the past six months

Answer & Comments

Answer: 4- Weight gain of 5 kg over the past six months

Co-existent hypertension may occur because of weight gain, but is not particularly indicative of an insulinoma.

Indeed, hypertension in the context of multiple endocrine neoplasia (MEN) may indicate a pheochromocytoma, which of course is associated with MEN2 where insulinomas do not occur.

A thyroid mass may indicate medullary thyroid carcinoma which is also associated with MEN2 not MEN1. If anything, glucagon levels are more likely to be elevated than reduced.



[Q: 4518] OnExamination 2012 - Misc

A 35-year-old woman presents with shortness of breath, palpitations and anxiety.

The episodes have been occurring over three years, but are worse recently. The episodes occur at stressful periods and are also related to difficult tasks at work. There is no history of drug or alcohol abuse.

What is the most appropriate pharmacological management for this patient?

- 1- Alprazolam
- 2- Chlorpromazine
- 3- Clomipramine
- 4- Paroxetine
- 5- Promethazine

Answer & Comments

Answer: 4- Paroxetine

In anxiety disorder, benzodiazepines are effective for short term stabilisation but should not be used for longer than two to four weeks.

Cognitive behavioural therapy is suggested to be particularly effective, though it is not widely available.

The use of benzodiazepines is associated with poorer outcomes. In longer term management, they are inferior to cognitive behavioural therapy and antidepressants.

NICE guidelines recommend first line pharmacological management with citalopram or escitalopram and suggest avoiding antipsychotics and sedative antihistamines.



[Q: 4519] OnExamination 2012 - Misc

A 45-year-old man has a history of progressive weakness for five weeks. He had particular difficulty getting out of the bath.

On examination there was severe truncal and proximal limb weakness, without wasting or fasciculation.

Tendon reflexes, plantar responses and sensation were all normal.

The vital capacity was 1.8L.

What is the most likely diagnosis?

- 1- Cervical myelitis
- 2- Guillain-Barre syndrome
- 3- Polio
- 4- Polymyositis
- 5- Syringobulbia

Answer & Comments

Answer: 4- Polymyositis

The presentation of myopathy is characterised by proximal weakness with normal reflexes and sensation and the absence of fasciculations.

Polymyositis is the commonest cause of inflammatory muscle disease in people under 50-years-old (inclusion body myositis is the commonest in those over 50-years-old).



[Q: 4520] OnExamination 2012 - Misc

A 70-year-old woman is diagnosed with anaplastic thyroid cancer.

What is the most likely consequence of this cancer?

- 1- Brain metastases
- 2- Hypercalcaemia from bony metastases
- 3- Liver metastases
- 4- Lung metastases
- 5- Upper airways obstruction

Answer & Comments

Answer: 5- Upper airways obstruction

Anaplastic thyroid cancer carries a very poor prognosis with the vast majority (~90%) having local invasion (cervical lymph glands) and local infiltration (particularly the trachea) at diagnosis.

Lung and bone metastases are common at presentation (~ 50%).

Upper airways obstruction frequently requires tracheostomy.



[Q: 4521] OnExamination 2012 - Misc

An 80-year-old male presents with a brief history of weakness and giddiness following an episode of diarrhoea.

He has been taking bendroflumethiazide for the last three years.

On examination his pulse is 100 beats per minute with a blood pressure of 130/80 mmHg (lying) and 100/70 mmHg (standing).

Investigations reveal:

Sodium 120 mmol/L(137-144)

Potassium 5.5 mmol/L(3.5-4.9)

Urea 13 mmol/L(2.5-7.5)

Creatinine 130 µmol/L(60-110)

Random plasma glucose 13 mmol/L(<11.1)

What is the most likely cause of the hyponatraemia?

- 1- Bendroflumethiazide
- 2- Diarrhoea
- 3- Hyperglycaemia
- 4- Inappropriate secretion of antidiuretic hormone
- 5- Renal tubular acidosis

Answer & Comments

Answer: 5- Renal tubular acidosis

The patient has diabetes as reflected by the elevated random glucose, has hyponatraemia, renal impairment and mild hyperkalaemia which appears to have been precipitated following diarrhoea.

Hypoadrenalism is unlikely as he has hyperglycaemia and the hyperglycaemia would itself be expected to cause a dehydration and hence hypernatraemia.

This sort of picture in an elderly male with diabetes is typical of hyporeninaemic hypoaldosteronism - type IV RTA - and could be exacerbated both by the diarrhoea and by the diuretic.

It is unlikely that the diarrhoea alone has caused the hyponatraemia.



[Q: 4522] OnExamination 2012 - Misc

A 45-year-old man has noted pain in his right knee for several years. There is no joint swelling. As he moves about during the day, the pain decreases.

The underlying disease process is probably which of the following?

- 1- Osteoarthritis
- 2- Osteochondroma
- 3- Osteomalacia

- 4- Osteopetrosis
- 5- Osteoporosis

Answer & Comments

Answer: 1- Osteoarthritis

Osteoarthritis is one of the most common joint diseases, and its incidence is increasing with the age and weight of the population. It presents with pain, commonly affecting the knees, hips and small joints of the hand. Pathogenesis involves the localised loss of cartilage, with remodelling of adjacent bone. The associated pain is exacerbated by exercise and relieved by rest, although in advanced disease rest and night pain can develop. There may also be joint stiffness, typically in the morning or after rest. Diagnosis is often late, and treatment is usually aimed at reducing pain and improving function rather than targeting the disease process.

Osteoporosis is characterised by progressive deterioration of bone micro-architecture, with associated decrease in bone mineral density. It is typically asymptomatic until the complicated by fracture when pain is exacerbated by movement.

Osteochondroma is a benign tumour of cartilage, which can be located about the knee. However, they commonly present in adolescence as a painless lump which grows with the bone. Pain is not a predominant symptom.

Osteomalacia is caused by a deficiency of vitamin D and presents with widespread bone pain and tenderness (especially lower back and hips), muscle weakness and lethargy,

Osteopetrosis, an uncommon inherited metabolic disorder, leads to 'brittle bones' that predispose to fractures. Isolated joint pain is not typically an associated feature.

This question tests your understanding of disease prevalence, and the relative

importance of certain symptoms and signs in differentiating disease. Patients rarely present with the classical textbook descriptions of symptoms. From the options given above osteoarthritis is the MOST LIKELY diagnosis.



[Q: 4523] OnExamination 2012 - Misc

An 18-year-old male is diagnosed with Becker's muscular dystrophy.

Which of the following statements concerning the genetics of the condition is correct?

- 1- His brothers will all be affected
- 2- His daughters' sons will have a 50% chance of having the disease
- 3- His daughters will have a 50% chance of being carriers
- 4- His sons' children will have a 50% chance of having the disease
- 5- His sons will be carriers of the condition

Answer & Comments

Answer: 2- His daughters' sons will have a 50% chance of having the disease

Becker's muscular dystrophy is an X linked condition and so 50% of males will be affected in a family.

His sons will get the X chromosome from his wife and so will not be carriers but all his daughters will be carriers.

However, his daughters' sons will consequently have a 50% chance of inheriting the disease as all his daughters are carriers and there is a one in two chance (50:50) of passing the gene on to their sons.

On the other hand his sons who are not affected do not pass on the condition.



[Q: 4524] OnExamination 2012 - Misc

A 50-year-old man is admitted to hospital with a third attack of renal stones in the last six months. He suffers from Crohn's disease and has previously had a limited small bowel resection, but his disease is now quiescent.

On examination his BP is 115/72 mmHg, his BMI is 19.5 kg/m², and he has a midline scar consistent with a previous laparotomy.

Investigations:

Haemoglobin 12.0 g/dl (13.5-17.7)

White cell count 5.9 x 10⁹/L (4-11)

Platelets 172 x 10⁹/L (150-400)

Serum sodium 139 mmol/l (135-146)

Serum potassium 3.9 mmol/l (3.5-5)

Creatinine 133 µmol/l (79-118)

24 hour urinary oxalate excretion Increased

Which of the following is likely to be the most effective and appropriate intervention?

- 1- Increase fluid intake
- 2- Reduce dietary calcium intake
- 3- Reduce intake of offal
- 4- Start bendroflumethiazide
- 5- Start furosemide

Answer & Comments

Answer: 1- Increase fluid intake

Reducing intake of offal is most helpful at reducing urate excretion; foods such as chocolate, rhubarb and nuts are high in oxalate. One contributor to this patient's increased oxalate excretion is undoubtedly his partial small bowel resection, and increasing dietary calcium intake decreases urinary oxalate excretion.

Therefore the most effective and appropriate intervention from those given is to increase his oral fluid intake significantly.



[Q: 4525] OnExamination 2012 - Misc

You are currently working in the local hospice on a palliative medicine rotation.

A patient is admitted from the GP with a one week history of fatigue, lethargy, itch and constipation. On arrival he appears drowsy and weak. On further questioning of his wife you note he has been confused at times and has no appetite.

On examination he looks dehydrated with a pulse of 60. Pupils look normal sized. Respiratory rate is 16 and the rest of the examination is unremarkable.

You review his letters from the oncologist and discover the underlying diagnosis is metastatic renal cell cancer. He has also been complaining of hip pain for the last eight weeks.

What is the most likely cause of this patient's deterioration?

- 1- Hypercalcaemia
- 2- Hyperglycaemia
- 3- Hypokalaemia
- 4- Morphine toxicity
- 5- Urinary tract infection

Answer & Comments

Answer: 1- Hypercalcaemia

Hypercalcaemia of malignancy is a palliative care emergency and should be considered in all patients presenting with acute deterioration.

It occurs in approximately 10% of patients with cancer and usually in those with disseminated cancer. Typical features include altered consciousness, fatigue, general aches, dehydration, constipation, bradycardias and other arrhythmias.

Morphine toxicity is unlikely here in view of the normal sized pupils and respiratory rate.

A severe urinary tract infection (with sepsis) could account for the symptoms but you would expect a tachycardia.

Therefore the most likely answer to fit with the clinical features is hypercalcaemia.



[Q: 4526] OnExamination 2012 -
Emergency Medicine

Which of the following reactions is involved in the metabolism of paracetamol under normal conditions?

- 1- Acetylation
- 2- Conjugation to glucuronic acid
- 3- Conjugation to glutathione
- 4- Cytochrome p450 dependent oxidation
- 5- Hydrolysis

Answer & Comments

Answer: 2- Conjugation to glucuronic acid

Paracetamol is conjugated to glucuronic acid and sulphate under normal conditions.

In overdose these processes become saturated and the drug is then conjugated with glutathione.

If the glutathione supply is depleted then a toxic metabolite is formed.



[Q: 4527] OnExamination 2012 -
Emergency Medicine

A 30-year-old male metal worker was referred to the plastic surgery department with a three day history of a painful right index finger.

On examination he has a red, swollen index finger with a small puncture wound on the tip of his index finger. All movements in his finger were normal. An x ray of his finger is shown.

What is the diagnosis?

- 1- Foreign body
- 2- Mallet finger
- 3- Osteomyelitis of the distal phalanx
- 4- Paronychia
- 5- Undisplaced fracture of the distal phalanx

Answer & Comments

Answer: 1- Foreign body

The radiographs of the patient's finger shows a foreign body which is most likely a metal splinter embedded beneath the nail bed. This has most likely given rise to a local infection. Option A is the correct answer.

The management would entail antibiotics and removal of the foreign body as a source of infection.

Osteomyelitis is an infection of bone. x Ray features of osteomyelitis do not usually become apparent until several weeks after the onset of disease. x Ray features may include bone remodelling, sclerosis, and thickening. Option C is not the correct answer.

No fractures are present on the radiograph; hence option E is not the correct answer.

Paronychia is a soft tissue infection around a fingernail. Although a paronychia is possible given the clinical findings, the x ray demonstrates a foreign body as the cause of the symptoms. Option D is incorrect.

Mallet finger is loss of extensor tendon continuity at the distal interphalangeal joint (DIPJ) which causes the joint to rest in an abnormally flexed position. Mallet finger cannot be the diagnosis as all finger movements were normal. Option B is not the correct answer.



[Q: 4528] OnExamination 2012 -
Emergency Medicine

A 40-year-old gentleman attends the emergency department with a stroke affecting his left arm and leg.

A CT scan confirms that there is a right CVA. Carotid scanning shows occlusion of the right carotid and 50% stenosis on the left.

What is the best course of action?

- 1- Bilateral carotid endarterectomy
- 2- Discharge and GP follow up
- 3- Discharge and outpatient follow up
- 4- Urgent carotid endarterectomy on the left

5- Urgent carotid endarterectomy on the right

Answer & Comments

Answer: 3- Discharge and outpatient follow up

This patient has a symptomatic carotid on the right but has an occlusion so the risk of future stroke is minimal from this carotid.

There is no benefit from carotid endarterectomy.



[Q: 4529] OnExamination 2012 -
Emergency Medicine

A 40-year-old man is admitted to the Emergency department after being involved in a house fire.

He is extremely drowsy but you notice on examining him that he seems well perfused, with his cheeks looking almost pink. His BP is 100/60 mmHg and his pulse is 95 and regular. Blood gas analysis reveals a CO level of 12% and a metabolic acidosis with a pH of 7.15.

Which of the following is the most appropriate next intervention?

- 1- Hyperbaric oxygen
- 2- IV mannitol
- 3- IV sodium bicarbonate
- 4- 100% oxygen by mask
- 5- Nebulised salbutamol

Answer & Comments

Answer: 4- 100% oxygen by mask

The answer is 100% oxygen by mask.

Hyperbaric oxygen is recommended by some countries including the US, although because of a lack of randomised control evidence it is not standard practice in the UK as there appears to be no significant improvement in outcome as opposed to high flow oxygen alone.

Sodium bicarbonate is not indicated, and IV mannitol is only used if there is suspicion of cerebral oedema.

Key to prognosis is removal from the source of carbon monoxide as quickly as possible, and instigation of high flow oxygen treatment. At a level of 12%, long term psychological disturbance or memory loss is possible.



[Q: 4530] OnExamination 2012 -
Emergency Medicine

A 22-year-old male is admitted wheezing with a respiratory rate of 35/min, a pulse of 120 beats per min, blood pressure 110/70 mmHg, peak expiratory flow rate <50% predicted.

The emergency medical services have administered salbutamol 5 mg (twice), ipratropium 0.5 mg and face mask oxygen.

His arterial blood gas reveals:

pH 7.42 (7.36-7.44)

paCO₂ 5.0 kPa (4.7-6.0)

paO₂ 22 kPa (11.3-12.6)

Base excess -2 mmol/l (+/-2)

SpO₂ 98

Which of the following is the most appropriate action for this man?

- 1- Chest x ray
- 2- Intensive care referral
- 3- Ipratropium
- 4- Magnesium 1-2 g
- 5- Oxygen 35 %

Answer & Comments

Answer: 4- Magnesium 1-2 g

This patient fits the criteria for life-threatening asthma. A normal PaCO₂ in an asthmatic is a warning of impending respiratory failure as the patient becomes too tired to ventilate adequately.

Initial treatment has been given: β_2 -agonists should be administered as soon as possible, preferably nebulised driven by oxygen. Repeat doses should be given at 15-30 minute intervals, or continuous nebulisation can be used where there is inadequate response to bolus therapy. Nebulised ipratropium bromide should be added for patients with acute severe or life threatening asthma, or those with a poor initial response. Its addition produces significantly greater bronchodilation than a β_2 -agonist alone. Oxygen should be given to maintain saturations at 94-98%. Patients with saturations less than 92% on air should have an ABG to exclude hypercapnia. However, starting treatment should not be delayed to do the ABG. Initially high-flow oxygen is used, and then weaned to maintain adequate saturations. Unless you suspect COPD there isn't a need to be cautious with oxygen therapy. This gentleman is receiving adequate ipratropium and oxygen, and repeating/increasing these are unlikely to help the situation markedly.

Failure to respond to the above treatment steps warrants the use of intravenous magnesium sulphate (or aminophylline, but this is not an option here). Magnesium has been shown to result in bronchial smooth muscle relaxation.

Intensive care is indicated for patients with severe acute or life threatening asthma who are failing to respond to therapy. Consider it in patients with deteriorating peak flow, persisting or worsening hypoxia, hypercapnia, acidosis, exhaustion or altered conscious state. All patients who are transferred to an intensive care unit should be accompanied by a doctor who can intubate if necessary. This would be considered if this gentleman fails to respond to magnesium, and in a clinical setting you would want to discuss him with your ITU colleagues whilst the magnesium was being given.

Chest radiographs are not indicated unless you suspect pneumothorax or consolidation,

or there is life-threatening asthma, a failure to respond to treatment or a need for ventilation.

As an additional point, steroids reduce mortality, relapses, subsequent hospital admission and requirement for β_2 -agonists. The earlier they are given in the attack, the better the outcome. A dose of 40-50mg should therefore be given once oxygen and nebuliser therapy has been established. This should be continued for 5 days, or until recovery, and can then be stopped abruptly unless the patient has taken long-term oral corticosteroids.



[Q: 4531] OnExamination 2012 -
Emergency Medicine

A 38-year-old man experiences sudden deterioration after being admitted to the intensive care unit because of severe pneumococcal pneumonia and septic shock.

Arterial blood gas analysis reveals:

pH 7.2(7.36-7.44)

paO₂ 12 kPa(10-13.3)

paCO₂ 4.7 kPa(4.7-6)

HCO₃⁻ 16 mmol/l (20-28)

Which one of the following changes will be found in this patient at this time?

- 1- Hyperventilation leading to the increase in CO₂ concentration
- 2- Increase production of HCO₃⁻
- 3- Increased renal excretion of HCO₃⁻
- 4- Raised hydrogen ions level in the blood
- 5- Respiratory acidosis

Answer & Comments

Answer: 4- Raised hydrogen ions level in the blood

This patient has a metabolic acidosis with a low HCO₃ and a normal PaCO₂.

In a patient with low pH, increased hydrogen ion concentration will be found.

He is not hyperventilating as indicated by the normal PaCO₂.

In chronic acidosis, for instance in advanced renal impairment, bicarbonate levels may be supplemented to buffer the raised hydrogen ion concentrations. Bicarbonate supplementation in this situation needs to be undertaken with great care as it may worsen an intracellular acidosis.



[Q: 4532] OnExamination 2012 - Emergency Medicine

An anxious 22-year-old female with a high respiration rate has the following arterial blood gas results:

pH 7.27 (7.36-7.44)

pCO₂ 2.6KPa (4.7-6.0)

Base deficit -12 mmol/l

What is the interpretation of the acid-base status?

- 1- Combined metabolic and respiratory acidosis
- 2- Combined metabolic and respiratory alkalosis
- 3- Metabolic acidosis with some compensatory respiratory alkalosis
- 4- Respiratory acidosis with some compensatory metabolic alkalosis
- 5- Respiratory alkalosis with some compensatory metabolic acidosis

Answer & Comments

Answer: 3- Metabolic acidosis with some compensatory respiratory alkalosis

This patient has a metabolic acidosis as evidenced by a pH of 7.27 and a base deficit, which is a marker of the extent of acidosis.

The low CO₂ is a reflection of the physiological respiratory compensation which is attempting to normalise pH by clearing the acidic gas CO₂.



[Q: 4533] OnExamination 2012 - Emergency Medicine

A 24-year-old man presented twelve hours after an overdose of dihydrocodeine 1.2 g and paracetamol 30 g.

He had pinpoint pupils, a Glasgow coma scale (GCS) score of 14 and a blood pressure of 100/60 mmHg.

Which one of the following is the most appropriate management?

- 1- 500 ml of 10% glucose intravenously over four hours.
- 2- Intravenous flumazenil.
- 3- Intravenous N-acetylcysteine.
- 4- Intravenous naloxone.
- 5- Oral activated charcoal.

Answer & Comments

Answer: 3- Intravenous N-acetylcysteine.

This patient's GCS is reasonable and the opiate-like effects seem minimal (no evidence of respiratory depression).

However, this patient has received a hefty dose of paracetamol conferring a high risk of hepatic toxicity. The 12 hour delay makes the absorptive effects of charcoal limited and although it would be useful as gastric emptying may be delayed it is not as important in this patient as the paracetamol antidote.

Even though the paracetamol level is not provided, he should be treated with N-acetylcysteine without delay.



[Q: 4534] OnExamination 2012 - Emergency Medicine

A 76-year-old man with a recent history of

cerebral haemorrhage is admitted with a cough, worsening breathlessness and right pleuritic chest pain. He is also mildly pyrexial.

His ventilation-perfusion scan reveals several areas of ventilation/perfusion mismatches in the right lower zone.

What is the most appropriate line of management?

- 1- Aspirin therapy
- 2- Antibiotics
- 3- Inferior vena cava (IVC) filter
- 4- Low molecular weight heparin treatment
- 5- Warfarin treatment

Answer & Comments

Answer: 3- Inferior vena cava (IVC) filter

This patient has a pulmonary embolism (PE) following a recent haemorrhagic stroke.

The risk of rebleeding into the stroke area is too high with anticoagulation.

The best action would be percutaneous insertion of IVC filter which may be as effective as anticoagulation. It is used in cases where anticoagulation is contraindicated or in those in whom anticoagulation alone fails.



[Q: 4535] OnExamination 2012 - Emergency Medicine

Which of the following would be expected to reduce maternal mortality when given in eclampsia?

- 1- Insulin and dextrose infusion
- 2- Low dose dopamine infusion
- 3- Magnesium infusion
- 4- Phenytoin infusion
- 5- Salbutamol infusion

Answer & Comments

Answer: 3- Magnesium infusion

Magnesium has been shown significantly to reduce maternal mortality in eclampsia and a favourable outcome may also be expected in pre-eclampsia.

None of the other agents has been associated with a reduced mortality in eclampsia.



[Q: 4536] OnExamination 2012 - Emergency Medicine

A 44-year-old immigrant from Romania presents to the emergency department with a headache, neck stiffness and gradually worsening confusion over the past few days.

You understand from his relative that he also has a chronic cough and has lost a significant amount of weight recently.

On examination he is pyrexial 37.8°C, his BP is 134/72 mmHg, pulse is 85 and regular. He has marked neck stiffness and photophobia.

Investigations show:

Haemoglobin 12.0 g/dl (13.5-17.7)

White cell count $11.5 \times 10^9/L$ (4-11)

Platelets $238 \times 10^9/L$ (150-400)

ESR 80 mm/hr(<10)

Sodium 133 mmol/l (135-146)

Potassium 4.2 mmol/l (3.5-5)

Creatinine 94 $\mu\text{mol/l}$ (79-118)

CXR fibrosis suspicious of tuberculosis

Lumbar puncture lymphocytic pleocytosis

PCR positive for tuberculosis

Which of the following is the correct duration of four drug therapy?

- 1- 1 month
- 2- 2 months
- 3- 6 months
- 4- 10 months
- 5- 18 months

Answer & Comments

Answer: 2- 2 months

All of the other options are incorrect because no matter what the location of infection, two months of four drug therapy is the standard, before reducing this to two drugs.

The exception is multi-drug resistant tuberculosis, where patients are commenced initially on five or more agents.



[Q: 4537] OnExamination 2012 -
Emergency Medicine

Which of the following is correct in malignant hyperpyrexia?

- 1- A mortality rate of 20% may be expected
- 2- Elevation of serum creatine kinase and myoglobinuria is diagnostic
- 3- Muscle biopsy may be histologically normal
- 4- The only available specific treatment is sodium dantrolene, which has a neutral pH
- 5- The predisposing gene is thought to be on chromosome 9

Answer & Comments

Answer: 3- Muscle biopsy may be histologically normal

Malignant hyperpyrexia (MH) is characterised by increased temperature and muscle rigidity during anaesthesia, which results from abnormal skeletal muscle contraction and increased metabolism.

The predisposing gene is thought to be on chromosome 19, close to the gene for the ryanodine/dihydropyridine receptor complex.

Known triggering agents include the volatile anaesthetic agents and suxamethonium. Patients show different sensitivity to the triggering agents and the reaction can be delayed by several hours.

Intravenous dantrolene (up to 10 mg/kg) is the only available specific treatment and care must be taken when administering as the solution has a pH of 9-10.

The prognosis of malignant hyperpyrexia is good when the appropriate treatment is instigated early, mortality being less than 5% (prior to dantrolene the mortality was 80%).

Serum creatine kinase elevation and myoglobinuria are suggestive but not diagnostic of MH. Myoglobin and creatine kinase are both known to increase after giving suxamethonium to normal patients.

Contracture tests using caffeine and halothane are the investigations of choice.

Muscle biopsies may appear histologically normal.



[Q: 4538] OnExamination 2012 -
Emergency Medicine

A 38-year-old policeman presents to the Emergency department with a painful left ring finger after attempting to arrest a criminal.

On examination his finger is flexed at the distal interphalangeal joint (DIPJ) and he is unable to straighten it actively. Passively the DIPJ can be moved freely. Examination of the rest of the hand is normal.

An x ray of his finger is shown.

What is the diagnosis?

- 1- Central slip rupture
- 2- DIPJ dislocation
- 3- Flexor digitorum superficialis rupture
- 4- Mallet finger
- 5- Volar plate injury

Answer & Comments

Answer: 4- Mallet finger

The x ray demonstrates a small avulsion fracture from the base of the distal phalanx

where the extensor tendon attaches. Given the clinical findings and x ray the diagnosis is mallet finger, therefore option D is a correct answer.

A flexion force on the tip of the extended finger jolts the DIPJ into flexion. This may result in a stretching or tearing of the tendon substance or an avulsion of the tendon's insertion on the dorsal lip of the distal phalanx base.

A DIPJ dislocation is not likely as the joint moves freely on examination and is congruent on the x ray.

Flexor digitorum superficialis is a flexor of the proximal interphalangeal and metacarpophalangeal joint. Hence option C is incorrect.

The central slip is part of the extensor expansion on the dorsal aspect of the finger. The central slip inserts onto the middle phalanx as it causes extension at the proximal interphalangeal joint (PIPJ). Hence, option A is incorrect.

The volar plate forms part of the floor of the joint capsule at the PIPJ. It separates the joint from the flexor tendons. Dislocations at the PIPJ can damage this structure and lead to pain, swelling and reduced movement at the PIPJ. In the above case the pathology is at the DIPJ, hence option E is incorrect.



[Q: 4539] OnExamination 2012 - Emergency Medicine

A 75-year-old lady attends the Emergency department with amaurosis fugax on the left.

Carotid scanning shows stenosis of 80% on the right and 90% on the left.

What is the best course of action?

- 1- Bilateral carotid endarterectomy
- 2- Discharge and GP follow up
- 3- Discharge and outpatient follow up
- 4- Urgent carotid endarterectomy on the left

- 5- Urgent carotid endarterectomy on the right

Answer & Comments

Answer: 4- Urgent carotid endarterectomy on the left

Amaurosis fugax describes a temporary loss of vision.

The eyesight then improves and becomes normal over about 15-30 minutes. It is caused by a blockage in the blood vessels at the back of the eye.

These patients are at increased risk of future stroke from the ipsilateral carotid artery.



[Q: 4540] OnExamination 2012 - Emergency Medicine

A 75-year-old lady attends the Emergency department with a stroke affecting her left arm and leg.

A CT scan confirms that there is a right CVA. Carotid scanning shows stenosis of 80% on the right and 90% on the left.

What is the best course of action?

- 1- Bilateral carotid endarterectomy
- 2- Discharge and GP follow up
- 3- Discharge and outpatient follow up
- 4- Urgent carotid endarterectomy on the left
- 5- Urgent carotid endarterectomy on the right

Answer & Comments

Answer: 5- Urgent carotid endarterectomy on the right

Although there is limited information available in this case, there is probably an indication for intervention in this patient. Carotid artery atherosclerosis is an important cause of ischaemic stroke. The left-sided neurological signs in this patient indicate the symptomatic carotid is on the right side.

Carotid endarterectomy has been established as an effective treatment for both symptomatic patients and asymptomatic patients who are shown to have carotid artery stenosis. It reduces the risk of disabling stroke or death by 48% in a person with severe symptomatic carotid stenosis (>70%) who has had a TIA. The peri-operative risk of disabling stroke or death is approximately 3%. Current UK guidelines recommend endarterectomy for symptomatic patients with greater than 70% stenosis, based on the North American Symptomatic Carotid Endarterectomy Trial which showed clear benefit. The endarterectomy should be performed as soon as the patient is fit for surgery, preferably within two weeks of a TIA.

The benefit is marginal for symptomatic patients with 50-69% stenosis, but may be greater in male patients. NICE recommends these patients are also considered for endarterectomy. There is significantly less benefit for asymptomatic patients, even those with greater than 60% stenosis. Patients with less than 50% stenosis should not be considered for carotid surgery.

Recurrent stenosis can occur in 1-20% of patients following endarterectomy, and re-operation is needed in 1-3% of cases. Ipsilateral strokes occur in 9% of patients following endarterectomy, and 26% of those treated with medical management alone (within 2 years).

All patients with suspected non-disabling stroke or TIA who are considered as candidates for carotid endarterectomy should have carotid imaging within 1 week.

Carotid endarterectomy is also indicated following a non-disabling stroke. However, if the patient has had a disabling stroke there is no real benefit in them undergoing the procedure.

Carotid stenting is increasingly being used as an alternative to endarterectomy. This is a less

invasive revascularisation strategy, and uses an embolic protection device. There seems to be a similar early risk of death or stroke, and similar long-term benefits. Risk is higher in elderly patients, possibly due to vascular tortuosity and calcification. The procedure is currently indicated in selected cases, such as restenosis.

* please note for this explanation we have used the North American Symptomatic Carotid Endarterectomy Trial (NASCET) criteria, as opposed to the European Carotid Surgery Trialists' Collaborative Group (ECST) criteria. See NICE guidelines for the difference - carotid imaging reports will state which criteria are being used.



[Q: 4541] OnExamination 2012 -
Emergency Medicine

A 25-year-old male presents after being bitten on the hand by a terrier. The wound appears deep and is associated with swelling.

After the wound is cleaned and he has received tetanus immunisation, which of the following antibiotic regimes would be most appropriate for this patient?

- 1- Co-amoxiclav oral
- 2- Doxycycline oral
- 3- Flucloxacillin oral
- 4- Penicillin G IM
- 5- Trimethoprim oral

Answer & Comments

Answer: 1- Co-amoxiclav oral

The use of prophylactic antibiotics in dog bites is controversial although evidence supports their use in deep wounds, bites to the hands and signs of infection.

The antibiotic of choice would be oral Augmentin.



[Q: 4542] OnExamination 2012 -
Emergency Medicine

A patient has just received intravenous ceftazidime. He immediately becomes flushed and wheezy, with a blood pressure of 80/40 mmHg.

Which of the following is the most appropriate immediate management for this patient?

- 1- Chlorphenamine 10 mg IV
- 2- Epinephrine 0.2 ml of 1:1000 IV
- 3- Epinephrine 0.5 mg IV
- 4- Epinephrine 0.5 mg i.m.
- 5- Hydrocortisone 100 mg IV

Answer & Comments

Answer: 4- Epinephrine 0.5 mg i.m.

Immediate treatment of anaphylaxis includes cessation of whatever caused it.

Then give oxygen, fluids and adrenaline/epinephrine 0.5 mg intramuscularly or subcutaneously.

Checking concentrations of adrenaline is very important especially in high pressure situations. Intravenous adrenaline is potentially hazardous unless diluted appropriately.



[Q: 4543] OnExamination 2012 -
Emergency Medicine

A 17-year-old girl presents following an overdose of paracetamol, her parents having found her with empty packets of paracetamol. She states that she has taken 100 tablets, three hours earlier.

Which is the most appropriate step in this patient's management?

- 1- Administer oral activated charcoal 50 g
- 2- Give N-acetylcysteine (NAC) intravenously
- 3- Measure plasma paracetamol concentration in one hour

4- Take no action

5- Transfer to young person's psychiatric unit immediately

Answer & Comments

Answer: 3- Measure plasma paracetamol concentration in one hour

This is a tricky question especially because in clinical practice this is rarely a black and white situation. The current UK guidelines state that NAC should be given if the plasma level taken at least four hours following ingestion is above the treatment line on the standard nomogram.

Knowing the timing of paracetamol tablet ingestion is therefore crucial for calculating whether treatment with the antidote N-acetylcysteine (NAC) is needed. It can take some time to swallow a substantial number of tablets, and the start of ingestion should be used if all tablets were taken within a period of an hour. If the tablets took longer than an hour to ingest you should treat as a staggered overdose.

The critical investigations in paracetamol overdose are appropriate timed serum paracetamol concentration, liver function (including prothrombin time or INR) and renal function. Prognosis is worse if any of these are abnormal at presentation. Paracetamol concentration should be measured between four and sixteen hours after ingestion of a single dose (i.e. over less than an hour). This allows the standard nomogram to be used to allow the patient's risk to be determined. Values obtained less than four hours cannot be interpreted because absorption is not yet complete. Values taken after sixteen hours may be high because acute liver injury delays paracetamol metabolism, or falsely reassuring. If paracetamol concentration is negative after twenty-four hours and liver and renal function is normal, there is low risk of serious harm.

Activated charcoal given within an hour of overdose can reduce absorption, but is unlikely to be useful if given over an hour following tablet ingestion.

Treatment for patients who have ingested a potentially lethal dose of paracetamol is the antidote N-acetylcysteine which is a sulphhydryl donor. It is given intravenously in three sequential infusions, based on the patient's body weight. Decisions to use it are based on assessment of the risk of serious liver damage, using the standard treatment nomogram. It works by replenishing glutathione stores. The efficacy declines from about eight hours after overdose, so it is important not to delay treatment beyond eight hours in patients who may have taken a lethal dose, even if the paracetamol level is not known.

In general, NAC is safe but it commonly causes nausea when given intravenously. It can also precipitate anaphylactoid reactions, more commonly in women, patients with asthma and those with a personal or family history of drug allergy. The risk of anaphylactoid reaction is also increased in patients with lower serum paracetamol concentrations.

As it has only been three hours since this patient ingested the paracetamol, the correct management plan is to wait one hour to check her serum level and give NAC if appropriate using the treatment nomogram.

Taking no action is not appropriate in this situation, and could lead to serious consequences including death. Psychiatric evaluation is of course needed but only after the patient is treated medically.



[Q: 4544] OnExamination 2012 - Emergency Medicine

A 60-year-old male is brought to casualty in the early hours of the morning after being found unconscious in the street.

On examination, he was drowsy but localised to painful stimuli. There was no evidence of head injury or meningism.

Investigations revealed:

Sodium 134 mmol/l (137-144)

Potassium 4.0 mmol/l (3.5-4.9)

Urea 4.0 mmol/l (2.5-7.5)

Creatinine 80 µmol/l (60-110)

Glucose 4.5 mmol/l (3.0-6.0)

Chloride 100 mmol/l (95-107)

Bicarbonate 25 mmol/l (20-28)

Plasma osmolality 385 mosmol/kg (278-305)

What is the most likely explanation for his presentation?

- 1- Diazepam poisoning
- 2- Ethanol poisoning
- 3- Methanol poisoning
- 4- Phenobarbitone poisoning
- 5- Phenytoin poisoning

Answer & Comments

Answer: 2- Ethanol poisoning

This man is intoxicated.

He has a normal acid base balance, slight hyponatraemia reflecting dilution, and very high osmolality reflecting the presence of ethanol.

Methanol would produce an acidosis.

Diazepam is not an osmolyte nor would the other agents produce this picture.



[Q: 4545] OnExamination 2012 - Emergency Medicine

Which one of the following is a recognised treatment option in poisoning?

- 1- Ethanol for isopropyl alcohol poisoning
- 2- Glucagon for cocaine poisoning

- 3- Methylene blue for cyanide poisoning
- 4- N-acetylcysteine in paraquat poisoning
- 5- Pralidoxime in sarin (nerve gas) poisoning

Answer & Comments

Answer: 5- Pralidoxime in sarin (nerve gas) poisoning

Sarin is an organophosphorus. Pralidoxime reactivates acetyl cholinesterase enzyme. It should be used in the first few hours.

Ethanol reduces the formation of toxic metabolites produced after ingestion of methanol and ethylene glycol, but not isopropyl alcohol.

Glucagon is used in symptomatic β -blocker overdose.

N-acetylcysteine is used in paracetamol overdose.

Methylene blue is the antidote for serious methaemoglobinaemia.



[Q: 4546] OnExamination 2012 - Emergency Medicine

A 30-year-old man presents to the Emergency department with a history of drug overdose.

He is known to be repeatedly admitted with similar episodes of self-harm. On this occasion he is drowsy and has prominent hypersalivation.

Which of the following agents, found on his person, is the likely cause?

- 1- Chlormethiazole
- 2- Cocaine
- 3- Dosulepin
- 4- L-dopa
- 5- Solvent cannister

Answer & Comments

Answer: 1- Chlormethiazole

Hypersalivation is seen with:

Parasympathomimetic agents

Insecticides

Arsenic

Strychnine

Chlormethiazole

Clozapine

and others.

Solvent abuse may cause an acneiform rash around the buccal cavity.

Cocaine abuse leads to hypertension and nasal septum perforation.

The other agents are anticholinergic and would cause dry mouth in overdose.



[Q: 4547] OnExamination 2012 - Emergency Medicine

A 50-year-old man returns to your clinic three weeks after Botox treatment for horizontal forehead furrows. He now complains that his eyebrows are drooping (eyebrow ptosis).

What is the cause of his complaint?

- 1- Increased forehead skin laxity
- 2- Paralysis of corrugators
- 3- Paralysis of frontalis
- 4- Paralysis of procerus
- 5- Paralysis of zygomaticus major

Answer & Comments

Answer: 3- Paralysis of frontalis

Botox is a neurotoxin derived from the bacteria, Clostridium botulinum.

It blocks neuromuscular transmission inhibition of acetylcholine release at the presynaptic membrane. The end result is that the muscle contraction is inhibited.

The action of Botox is not permanent because collateral axonal sprouting establishes new neuromuscular junctions, restoring muscle function.

Botox does not affect skin laxity, hence option A is wrong.

Corrugator and procerus are both muscles that depress the eyebrow, therefore paralysis of these muscles would cause the opposite to eyebrow ptosis, hence options B and D are wrong.

Zygomaticus major elevates and retracts the angle of mouth and does not affect the eyebrows, hence option E is wrong.

Frontalis is a quadrilateral muscle found on the forehead that elevates the eyebrows; hence paralysis of this muscle can lead to eyebrow ptosis.



[Q: 4548] OnExamination 2012 - Emergency Medicine

A 19-year-old girl presents with an overdose of paracetamol.

Which of the following statements is correct?

- 1- Acetylcystine should routinely be given if the presentation is within the first 12 hours of overdose
- 2- Because she is over the age of 6, she is unlikely to develop significant toxicity
- 3- Hospitalisation will be needed for at least five days
- 4- Liver function tests should be monitored
- 5- The mortality in those with an AST of >350 IU/l is 4%

Answer & Comments

Answer: 4- Liver function tests should be monitored

Treatment with N-acetylcysteine (NAC) is given according to a standard nomogram. NAC

may be useful up to 36 hours following ingestion.

Children under the age of 6 are unlikely to develop significant toxicity, but adolescents have a higher incidence of toxic plasma levels following ingestion, and a higher incidence of abnormal aspartate transaminase (AST) >1000 IU/l.

Even after serious hepatotoxicity, the mortality rate is under 0.5%.

The occasional patient may require liver transplantation.



[Q: 4549] OnExamination 2012 - Emergency Medicine

A 75-year-old lady attends the Emergency department with dizziness and fainting. She has fully recovered. Neurological examination is normal.

Carotid scanning shows stenosis of 80% on the right and 90% on the left.

What is the best course of action?

- 1- Bilateral carotid endarterectomy
- 2- Discharge and GP follow up
- 3- Discharge and outpatient follow up
- 4- Urgent carotid endarterectomy on the left
- 5- Urgent carotid endarterectomy on the right

Answer & Comments

Answer: 3- Discharge and outpatient follow up

Dizziness and fainting are not associated with transient ischaemic attacks (TIAs) or strokes and as such are not an indication for urgent carotid intervention.

However, she has bilateral, asymptomatic, severe ICA stenoses.

The choices are bilateral endarterectomy, bilateral stenting or best medical treatment. This is an individual decision to be made after an outpatient discussion.



[Q: 4550] OnExamination 2012 -
Emergency Medicine

A 50-year-old gentleman attends the Emergency department with weakness affecting his left arm and leg.

Carotid scanning shows 70% stenosis of the right carotid artery.

Which of the following statements is correct?

- 1- Carotid endarterectomy should be performed
- 2- Carotid endarterectomy should not be performed
- 3- Carotid stenting is associated with lower rates of stroke than surgery
- 4- Carotid stenting is proven to be safer than carotid endarterectomy
- 5- Carotid stenting should be performed

Answer & Comments

Answer: 1- Carotid endarterectomy should be performed

There is an indication for intervention in this patient. Carotid artery atherosclerosis is an important cause of ischaemic stroke. The left-sided neurological signs in this patient indicate the symptomatic carotid is on the right side.

Carotid endarterectomy has been established as an effective treatment for both symptomatic patients and asymptomatic patients who are shown to have carotid artery stenosis. It reduces the risk of disabling stroke or death by 48% in a person with severe symptomatic carotid stenosis (>70%) who has had a TIA. The peri-operative risk of disabling stroke or death is approximately 3%. Current UK guidelines recommend endarterectomy for symptomatic patients with greater than 70% stenosis, based on the North American Symptomatic Carotid Endarterectomy Trial which showed clear benefit. The endarterectomy should be performed as soon

as the patient is fit for surgery, preferably within two weeks of a TIA.

The benefit is marginal for symptomatic patients with 50-69% stenosis, but may be greater in male patients. NICE recommends these patients are also considered for endarterectomy. There is significantly less benefit for asymptomatic patients, even those with greater than 60% stenosis. Patients with less than 50% stenosis should not be considered for carotid surgery

Recurrent stenosis can occur in 1-20% of patients following endarterectomy, and re-operation is needed in 1-3% of cases. Ipsilateral strokes occur in 9% of patients following endarterectomy, and 26% of those treated with medical management alone (within 2 years).

All patients with suspected non-disabling stroke or TIA who are considered as candidates for carotid endarterectomy should have carotid imaging within 1 week.

Carotid endarterectomy is also indicated following a non-disabling stroke. However, if the patient has had a disabling stroke there is no real benefit in them undergoing the procedure.

Carotid stenting is increasingly being used as an alternative to endarterectomy. This is a less invasive revascularisation strategy, and uses an embolic protection device. There seems to be a similar early risk of death or stroke, and similar long-term benefits. Risk is higher in elderly patients, possibly due to vascular tortuosity and calcification. The procedure is currently indicated in selected cases, such as restenosis.

* please note for this explanation we have used the North American Symptomatic Carotid Endarterectomy Trial (NASCET) criteria, as opposed to the European Carotid Surgery Trialists' Collaborative Group (ECST) criteria. See NICE guidelines for the difference - carotid

imaging reports will state which criteria are being used.



[Q: 4551] OnExamination 2012 -
Emergency Medicine

A 17-year-old woman is admitted by emergency ambulance. She has apparently taken a large overdose of her father's anti-hypertensive medication after he refused to allow her to see her boyfriend who is 21.

On admission to the emergency department she is hypotensive, with a BP of 80/55 mmHg, and a pulse of 28.

Investigations show

Hb 12.1 g/dl(13.5-18)

WCC $7.8 \times 10^9/L$ (4-10)

PLT $191 \times 10^9/L$ (150-400)

Na 139 mmol/l (134-143)

K 4.6 mmol/l (3.5-5)

Cr 85 $\mu\text{mol/l}$ (60-120)

Gluc 2.8 g/dl(7.0-11.0)

Her rate increases to 35 after 3 mg of atropine, but little improvement in BP is seen.

Which of the following is the next most appropriate step?

- 1- Further 1 mg atropine
- 2- IM adrenalin
- 3- IV adrenalin
- 4- IV glucagon
- 5- Temporary pacing

Answer & Comments

Answer: 4- IV glucagon

Glucagon is the conventional antidote for β -blocker overdose, the most likely cause of this patient's presentation. It reverses hypoglycaemia, and improves myocardial contractility and heart rate by stimulating production of cyclic AMP.

Doses of glucagon used are much higher than those conventionally used for reversing hypoglycaemia in diabetes, with a bolus of 3-10 mg being required, then 2-5 mg/hr by infusion.



[Q: 4552] OnExamination 2012 -
Emergency Medicine

A 35-year-old business man presents with anxiety and palpitations after 'snorting' cocaine. The patient denies any prior use and has also consumed some alcohol.

On examination, he is distressed and sweating with a temperature of 38°C , pulse of 138 beats per minute (regular) and a blood pressure of 216/110 mmHg. His ECG reveals a sinus tachycardia.

Which of the following is the most appropriate initial treatment for this man?

- 1- Dantrolene
- 2- Diazepam
- 3- Lidocaine
- 4- Propranolol
- 5- Verapamil

Answer & Comments

Answer: 2- Diazepam

Cocaine abuse is quite common and neurological and cardiovascular side effects predominate.

Delirium, hyperthermia, arrhythmias, myocardial and cerebral infarction are reported.

In this patient, the first consideration should be to establish adequate ventilation and support the circulation, and also to remove any residual cocaine from the nostrils.

Generally, the toxic effects of cocaine are short-lived and relate to sympathetic stimulation, as in this case with tachycardia, pyrexia and hypertension.

Initial treatment of cocaine poisoning involves intravenous administration of diazepam to control agitation, and cooling measures for hyperthermia.

Sedation with diazepam may also be appropriate initial therapy for hypertension and tachycardia in this situation since the excessive sympathetic tone is largely centrally mediated.

Control of anxiety and agitation with diazepam when combined with rapid cooling may also decrease heat production in hyperthermic patients.

If further treatment is required, an intravenous nitrate is particularly useful for associated coronary artery spasm.



[Q: 4553] OnExamination 2012 -
Emergency Medicine

A 45-year-old man attends the Emergency department with symptoms suggestive of community acquired pneumonia.

On examination he is pyrexial at 38.0°C and has a respiratory rate of 32/min, with a blood pressure of 85/55 mmHg.

Which of the following combination of features are not necessarily an indication for urgent hospital admission?

- 1- BP of 85/55 mmHg and respiratory rate of 32/min
- 2- BP of 85/55 mmHg and urea of 7.5 mmol/l
- 3- Confusion and BP of 85/55 mmHg
- 4- Pyrexia of 38.0°C and serum urea of 7.5 mmol/l
- 5- Respiratory rate of 32 and blood urea of 7.5 mmol/l

Answer & Comments

Answer: 4- Pyrexia of 38.0°C and serum urea of 7.5 mmol/l

This patient has community-acquired pneumonia (CAP).

The severity of each case of CAP should be assessed using the CURB-65 tool in conjunction with clinical judgement. Patients score 1 point for each of:

- Confusion
- Urea 7mmol/L
- Respiratory rate > 30/min
- Blood pressure: systolic <90 or diastolic < 60 mmHg
- Age > 65years

A CURB-65 score of 0 or 1 are at low risk of death, and can be treated at home if the social circumstances are compatible. A score of 2 usually indicates inpatient treatment is required, but hospital-supervised outpatient treatment can be considered. Patients who have a CURB-65 score of 3 or more are at high risk of death. Those with scores of 4 and 5 should be considered for treatment in a critical care unit (HCU, ITU).

In this question, option four has a CURB-65 score of 1 and outpatient treatment can therefore be considered. All the others are indications for inpatient treatment.

Clinical judgement must still however be used particularly if only one feature is present or if there is co-morbidity such as age over 50 years or chronic cardiac, respiratory or renal disease.



[Q: 4554] OnExamination 2012 -
Emergency Medicine

A 17-year-old male presents to the Emergency department after an overdose of alcohol and paracetamol.

He complained of abdominal discomfort and an intravenous infusion of N-acetylcysteine was commenced. 15 minutes later he

developed breathlessness, reported feeling flushed and developed a tachycardia.

Which of the following is most likely to have occurred?

- 1- A disulfiram-like (antabuse) reaction has occurred
- 2- The patient has developed pulmonary oedema
- 3- The patient has had a panic attack
- 4- The patient has received an overdose of N-acetylcysteine
- 5- The patient has received N-acetylcysteine previously

Answer & Comments

Answer: 5- The patient has received N-acetylcysteine previously

This patient is having an acute hypersensitivity reaction, the most common dose-independent adverse drug reaction.

It is caused by previous exposure and being sensitised to the drug.

The initial exposure induces the production of antibodies of immunoglobulin (Ig) E class, subsequent exposure induces an immunological reaction - anaphylaxis.

Some drugs can produce a similar pseudoallergic reaction on first exposure.



[Q: 4555] OnExamination 2012 - Emergency Medicine

A 42-year-old woman presents following an episode of confusion associated with vomiting and abdominal pain.

She had a one month history of weight loss and receives thyroxine for hypothyroidism which was diagnosed five years ago.

On examination she appeared unwell, with a temperature of 37.5°C and her blood pressure was 100/50 mmHg.

Investigations revealed:

Sodium 130 mmol/L (137-144)

Potassium 4.8 mmol/L (3.5-4.9)

Urea 7.6 mmol/L (2.5-7.5)

Glucose 2.7 mmol/L (3.0-6.0)

Free T₄ 9 pmol/L (10-22)

TSH 1 mU/L (0.4-5)

Which one of the following given intravenously would be the most appropriate initial management?

- 1- 10% dextrose infusion
- 2- Cefuroxime
- 3- Glucagon
- 4- Hydrocortisone
- 5- Tri-iodothyronine

Answer & Comments

Answer: 4- Hydrocortisone

This woman presents with classical features of Addison's disease and the most appropriate and lifesaving therapy is steroids given intravenously.

The abnormal thyroid function tests are often encountered in association with acute hypoadrenalism.

Giving thyroxine may actually exacerbate the condition.



[Q: 4556] OnExamination 2012 - Emergency Medicine

A 16-year-old girl is brought to the Emergency department after having taking drugs at a rave.

Which of the following suggests that she has taken Ecstasy (MDMA)?

- 1- Hypernatraemia
- 2- Metabolic acidosis
- 3- Pin-point pupils

4- Pyrexia

5- Respiratory depression

Answer & Comments

Answer: 4- Pyrexia

The features of ecstasy overdose include:

Hyperthermia

Hypertension

Hyponatraemia due to polydipsia associated with syndrome of inappropriate antidiuretic hormone (SIADH) and

Respiratory alkalosis.

Pin-point pupils suggest opiates.

[Q: 4557] OnExamination 2012 -
Emergency Medicine*Which of the following is correct concerning a precordial thump?*

- 1- Can be delivered up to twice during a cardiac arrest
- 2- Can be given following an unwitnessed cardiac arrest
- 3- Is more successful with pulseless VT than VF
- 4- Should be administered after a warning has been given to the patient
- 5- Should be aimed at the position of V4 on the anterior chest wall

Answer & Comments

Answer: 3- Is more successful with pulseless VT than VF

The 2010 ALS guidelines state that if a patient has a monitored and witnessed VF/VT arrest in hospital, three quick successive (stacked) shocks should be given. Chest compressions should be started immediately after the third, with a compression to ventilation ratio of 30:2 for 2 minutes.

A precordial thump can be successful if given within seconds of the onset of a shockable rhythm. Delivery should not delay calling for help, or accessing a defibrillator, but would be indicated here whilst awaiting the defibrillator. Chest compressions should start immediately if it is unsuccessful. Only one thump should be delivered over the lower third of the sternum. The ulnar edge of a tightly clenched fist is used to deliver a sharp impact from a height of about 20cm, then retract immediately (thereby creating an impulse-like stimulus). Repeating a precordial thump is not recommended.

Warning a patient who has arrested will serve little purpose.

It is important to remember that a precordial thump has a very low success rate for cardioversion. In general it delivers approximately 7-10 joules of energy, but this is operator dependent and references vary to this regard. There is more success with pulseless VT than with VF.

[Q: 4558] OnExamination 2012 -
Emergency Medicine

A 35-year-old woman with known seafood allergy presented after developing an itchy rash at a restaurant. She had widespread urticaria which spared her neck and face.

On examination, her blood pressure was 130/70 mmHg, pulse 95 bpm, respiratory rate 24/min and O₂ saturation 99% on air.

Intravenous hydrocortisone and intramuscular antihistamine have been given.

What is the next most appropriate step in the management of this patient?

- 1- Inhaled adrenaline
- 2- Intramuscular adrenaline
- 3- Intravenous adrenaline
- 4- Observe
- 5- Subcutaneous adrenaline

Answer & Comments

Answer: 4- Observe

Where there is a history of a typical allergic reaction, as here, current United Kingdom resuscitation guidelines suggest adrenaline if there is:

Stridor

Wheeze

Respiratory distress or

Clinical evidence of shock.

Reference:

A literature review in the BMJ includes a copy of the algorithm and a discussion of the evidence for adrenaline. BMJ 2003;327:1332-1335



[Q: 4559] OnExamination 2012 - Emergency Medicine

Which of the following is currently recommended as the drug of choice in treating refractory ventricular fibrillation or pulseless ventricular tachycardia?

- 1- Adenosine
- 2- Amiodarone
- 3- Bretylium
- 4- Lidocaine
- 5- Magnesium

Answer & Comments

Answer: 2- Amiodarone

300 mg of amiodarone made up to 20 ml with 5% dextrose given as an intravenous bolus is the drug of choice.

100 mg of lidocaine may be given intravenously when amiodarone is unavailable.

Historically 5 mg/Kg of bretylium was given, but it is no longer recommended.



[Q: 4560] OnExamination 2012 - Emergency Medicine

An 80-year-old gentleman attends the Emergency department with a stroke affecting his left arm and leg.

He has had radiotherapy to the neck and there is a lot of scarring present. Carotid scanning shows 70% stenosis in the symptomatic side.

Which statement is correct?

- 1- Carotid endarterectomy is contraindicated
- 2- Carotid endarterectomy should be performed
- 3- Carotid stenting is associated with lower rates of stroke than surgery
- 4- Carotid stenting is proven to be safer than carotid endarterectomy
- 5- Carotid stenting should be performed

Answer & Comments

Answer: 5- Carotid stenting should be performed

There is an indication for intervention in this patient.

As the patient has a hostile neck it would be difficult to perform a carotid endarterectomy but not contraindicated.

It would be preferable to perform carotid stenting if possible.



[Q: 4561] OnExamination 2012 - Emergency Medicine

A 90-year-old lady attends the Emergency department with a dense stroke affecting her left arm and leg.

She is hemiplegic and confused. A CT scan confirms that there is a right CVA. Carotid scanning shows stenosis of 75% on the right and 90% on the left.

What is the best course of action?

- 1- Admit but no surgical intervention

- 2- Bilateral carotid endarterectomy
- 3- Discharge and GP follow up
- 4- Urgent carotid endarterectomy on the left
- 5- Urgent carotid endarterectomy on the right

Answer & Comments

Answer: 1- Admit but no surgical intervention

This patient has a symptomatic carotid stenosis on the right that would be appropriate for surgery if this were a TIA or resolving stroke.

Unfortunately, with dense strokes, if there is no recovery, the benefits are greatly reduced due to end-organ damage.

Revascularisation would have the risk of reperfusion haemorrhage.

The benefit of endarterectomy is prevention of future stroke.



[Q: 4562] OnExamination 2012 -
Emergency Medicine

A 75-year-old lady attends the Emergency department with a stroke affecting her left arm and leg.

A CT scan confirms that there is a right CVA. Carotid scanning shows stenosis of 50% on the right and 90% on the left.

What is the best course of action?

- 1- Bilateral carotid endarterectomy
- 2- Discharge and GP follow up
- 3- Discharge and outpatient follow up
- 4- Urgent carotid endarterectomy on the left
- 5- Urgent carotid endarterectomy on the right

Answer & Comments

Answer: 3- Discharge and outpatient follow up

Carotid artery atherosclerosis is an important cause of ischaemic stroke. The left-sided neurological signs in this patient (which are

consistent with a TIA) indicate the symptomatic carotid is on the right side.

Carotid endarterectomy has been established as an effective treatment for both symptomatic patients and asymptomatic patients. It reduces the risk of disabling stroke or death by 48% in a person with severe symptomatic carotid stenosis (>70%) who has had a TIA. The peri-operative risk of disabling stroke or death is approximately 3%. Current UK guidelines recommend endarterectomy for symptomatic patients with greater than 70% stenosis, based on the North American Symptomatic Carotid Endarterectomy Trial which showed clear benefit. The endarterectomy should be performed as soon as the patient is fit for surgery, preferably within two weeks of a TIA.

The benefit is marginal for symptomatic patients with 50-69% stenosis, but may be greater in male patients. NICE recommends these patients are also considered for endarterectomy. There is significantly less benefit for asymptomatic patients, even those with greater than 60% stenosis. Patients with less than 50% stenosis should not be considered for carotid surgery.

Recurrent stenosis can occur in 1-20% of patients following endarterectomy, and re-operation is needed in 1-3% of cases. Ipsilateral strokes occur in 9% of patients following endarterectomy, and 26% of those treated with medical management alone (within 2 years).

All patients with suspected non-disabling stroke or TIA who are considered as candidates for carotid endarterectomy should have carotid imaging within 1 week.

Carotid endarterectomy is also indicated following a non-disabling stroke. However, if the patient has had a disabling stroke there is no real benefit in them undergoing the procedure.

Carotid stenting is increasingly being used as an alternative to endarterectomy. This is a less invasive revascularisation strategy, and uses an embolic protection device. There seems to be a similar early risk of death or stroke, and similar long-term benefits. Risk is higher in elderly patients, possibly due to vascular tortuosity and calcification. The procedure is currently indicated in selected cases, such as restenosis.

* please note for this explanation we have used the North American Symptomatic Carotid Endarterectomy Trial (NASCET) criteria, as opposed to the European Carotid Surgery Trialists' Collaborative Group (ECST) criteria. See NICE guidelines for the difference - carotid imaging reports will state which criteria are being used.



[Q: 4563] OnExamination 2012 -
Emergency Medicine

A 21-year-old man who has a past history of IV drug abuse presents 12 hours after taking an overdose of 480 mg of codeine and 30 g of paracetamol.

His blood pressure is 100/60 mmHg and he has pin-point pupils.

What is the most appropriate management for this patient?

- 1- 500ml 10% glucose IV over four hours
- 2- 1 litre normal saline IV over six hours
- 3- IV naloxone
- 4- IV flumazenil
- 5- Start N-acetylcysteine

Answer & Comments

Answer: 5- Start N-acetylcysteine

This patient presents 12 hours after taking a potentially fatally toxic dose of paracetamol.

In the circumstances provided in this question where there is an absence of data relating to pulse rate (as he is probably not in shock),

respiratory rate (reflecting respiratory depression) or blood glucose, the most appropriate intervention at this 12 hour time-point would be N-acetylcysteine.

The urgency of treatment is underlined by the fact that the incidence of hepatotoxicity is worse if treatment is delayed.

Trials of N-acetylcysteine suggest that the incidence of hepatotoxicity is 1% in those treated within eight hours as opposed to 46% in those treated after 16 hours.



[Q: 4564] OnExamination 2012 -
Emergency Medicine

A 17-year-old woman presented six hours after taking 30 g of paracetamol.

Which of the following factors is most likely to predict an increased risk of hepatotoxicity from the paracetamol?

- 1- Anorexia nervosa
- 2- Consumption of 20 units of alcohol since taking the paracetamol
- 3- Gilbert's disease
- 4- Ingestion of amitriptyline with the paracetamol
- 5- Smoking 20 cigarettes per day

Answer & Comments

Answer: 1- Anorexia nervosa

High risk groups in paracetamol overdose include:

malnourished patients (anorexia nervosa/bulimia nervosa)

patients taking enzyme inducing drugs (e.g. carbamazepine, phenytoin, rifampicin and St John's wort)

patients with induced liver enzymes due to chronic ethanol abuse

human immunodeficiency virus (HIV) positive patients.

More information



[Q: 4565] OnExamination 2012 -
Emergency Medicine

A 64-year-old woman presented 10 hours after ingestion of 12 g of quinine sulphate.

Which of the following is the most common characteristic clinical feature in this situation?

- 1- Blindness
- 2- Bradycardia
- 3- Hyperacusis
- 4- Hyperglycaemia
- 5- Hypotension

Answer & Comments

Answer: 1- Blindness

The major toxic effects of quinine are on the nervous system, in particular the optic and auditory nerve. It is also particularly toxic on retinal photoreceptor cells, and causes vasoconstriction and spasm of the retinal artery. Blurred vision can proceed to complete blindness, which is characteristic of overdose. Initial signs are narrowing of the retinal arterioles on fundoscopy. Later there is retinal oedema, and the pupils become dilated and unresponsive to light.

Effects on the auditory nerve may cause tinnitus and deafness, but not hyperacusis.

Initially quinine causes generalised stimulation of the central nervous system, leading to tachycardia, fever, delirium and tachypnoea. In severe overdose it can then cause myocardial depression, peripheral vasodilation and widened QRS with prolonged QTc and risk of VT, torsade and VF.

In addition, renal failure, haemolytic anaemia and gastrointestinal disturbance can develop. At very high plasma levels, sinoatrial block and high-degree atrioventricular block may be seen. Hypotension may occur secondary to

quinine's alpha-blocking effect, but is not as characteristic as blindness.

Additional features include nausea, vomiting, headache, seizures, fatigue, tremor and ataxia. Hyperglycaemia is not characteristic.

Management is with activated charcoal and gastric lavage, if presentation is early enough. Bradycardia can be treated with atropine or pacing. Bicarbonate is considered for a prolonged QRS (>120ms), aiming for a pH of 7.45-5. Haemodialysis can also be used to clear the quinine. There is no specific treatment for visual disturbance.



[Q: 4566] OnExamination 2012 -
Emergency Medicine

A 20-year-old man presented after ingesting a drug at a party. Investigations revealed a serum creatine kinase of 10,000 IU/l (NR 24-195).

Which one of the following drugs is most likely to have been responsible?

- 1- Cannabis
- 2- Diazepam
- 3- Ecstasy (MDMA)
- 4- Gamma hydroxybutyrate (GHB)
- 5- Ketamine

Answer & Comments

Answer: 3- Ecstasy (MDMA)

Symptoms of an acute MDMA toxic reaction include:

- Agitation
- Tachycardia
- Hypertension
- Dilated pupils
- Trismus
- Sweating

whereas the more severe cases may be characterised by:

Hyperthermia

Disseminated intravascular coagulation (DIC)

Rhabdomyolysis

Acute renal failure.

In more severe cases, elevated creatine kinase levels are often present, with levels as high as 555,000 IU/l being reported.

Neither GHB nor ketamine are associated with elevated CK levels.

Phencyclidine (PVP) is another drug which may cause an elevated CK in overdose.

massive overdose and usually associated with lactic acidosis.

It is too early to carry out paracetamol levels as these should be carried out at four hours.

Although he states that he has taken 18 g of paracetamol this may not be the case and he may not require N-acetyl cysteine. You can wait. In fact the benefit of N-acetyl cysteine is maximum as long as it is given within eight hours of ingestion. Its benefit extends up to 24 hours.

An elevated international normalised ratio (INR) gives an indication of hepatocellular damage and again this will not be seen at presentation of paracetamol overdose.



[Q: 4567] OnExamination 2012 -
Emergency Medicine

A youth worker, aged 40, presents to the Emergency department with vomiting.

On detailed questioning, he states that he has taken about 36 paracetamol tablets two hours previously. He is vomiting profusely with a blood pressure of 90/60 mmHg.

Which of the following measures would be the most appropriate immediate step in the management of this patient?

- 1- Coagulation screen
- 2- IV fluids
- 3- IV N-acetyl cysteine
- 4- Oral methionone
- 5- Paracetamol levels

Answer & Comments

Answer: 2- IV fluids

The most pressing issue in this patient is resuscitation as he is vomiting and is hypotensive.

It is unusual to see such hypotension in paracetamol overdose but is feasible in a



[Q: 4568] OnExamination 2012 -
Emergency Medicine

In adult basic life support which of the following is the correct ratio of chest compressions to ventilations?

- 1- 5 to 1
- 2- 8 to 1
- 3- 10 to 1
- 4- 15 to 2
- 5- 30 to 2

Answer & Comments

Answer: 5- 30 to 2

Fifteen compressions to two breaths was the recommended ratio regardless of the number of rescuers performing basic life support, but the recent guidelines now suggest 30:2.



[Q: 4569] OnExamination 2012 -
Emergency Medicine

A 72-year-old lady presented after taking an overdose of a sustained-release propranolol preparation.

She has a pulse of 40 bpm and a BP of 90/60 mmHg.

She was given atropine by the Emergency department staff but there has been little response.

Which of the following is the most appropriate treatment?

- 1- Atropine
- 2- Glucagon
- 3- Haemodialysis
- 4- Noradrenaline
- 5- Salbutamol

Answer & Comments

Answer: 2- Glucagon

'For cases of β -blocker poisoning where symptomatic bradycardia and hypotension are present, high-dose glucagon is considered the first-line antidote.' Am J Health Syst Pharm. 2006 Oct 1;63(19):1828-35



[Q: 4570] OnExamination 2012 - Emergency Medicine

In most cardiac arrest situations 1mg of adrenaline (epinephrine) is given intravenously every three minutes.

What is the correct volume and concentration of the adrenaline?

- 1- 0.1 ml of 1 in 100
- 2- 1 ml of 1 in 1000
- 3- 10 ml of 1 in 1000
- 4- 1 ml of 1 in 10,000
- 5- 10 ml of 1 in 10,000

Answer & Comments

Answer: 5- 10 ml of 1 in 10,000

A 1 mg dose of adrenaline (epinephrine) would be administered with 0.1 ml of 1 in 100, 1 ml of 1 in 1000 and 10 ml of 1 in 10,000.

However, 10 ml of 1 in 10,000 is the recommended dose and concentration and is

considered the optimum volume of adrenaline during cardiac arrest, and is recommended by the UK Resuscitation Council.



[Q: 4571] OnExamination 2012 - Emergency Medicine

A 51-year-old homeless man is seen in the Emergency department with a two day history of a painful left little finger. He speaks little English and a history is difficult to establish.

On examination he has fusiform swelling of the finger with a small laceration on the pulp which looks old. The finger is held in flexion, there is pain on passive extension of the finger and tenderness on the volar aspect of the finger. Examination of the other fingers was unremarkable.

What is the diagnosis?

- 1- Acute paronychia
- 2- Cellulitis
- 3- Flexor sheath infection
- 4- Interphalangeal joint septic arthritis
- 5- Palmar space infection

Answer & Comments

Answer: 3- Flexor sheath infection

Flexor sheath infection or infectious flexor tenosynovitis results from a microorganism (commonly *Staphylococcus aureus*) multiplying in the closed space of the flexor tendon sheath and culture-rich synovial fluid medium. This is usually secondary to penetrating trauma to the hand.

The septic process and this inflammatory reaction within the tendon sheath quickly interfere with the gliding mechanism, leading to adhesions and scarring. The ultimate consequences are tendon necrosis, disruption of the tendon sheath, and digital contracture.

Physical examination reveals Kanavel signs of flexor tendon sheath infection, which are:

Finger held in slight flexion

Fusiform swelling

Tenderness along the flexor tendon sheath, and

Pain with passive extension of the digit.

Treatment is urgent surgical washout of the flexor sheath and intravenous antibiotics.

Septic arthritis of the interphalangeal joints is extremely rare and usually presents with pain, swelling, and reduced range of motion of an individual joint.

Acute paronychia often presents with a history of minor trauma to the fingertip. The presenting complaints are pain, tenderness, and swelling in one of the lateral folds of the nail and not along the finger.

Palmar space infection is an infection of one or all the fascial compartments of the hand. It may result from untreated flexor sheath infection. It presents with pain and swelling of the entire hand with pain on massive movement of all digits. The patient in the scenario experienced pain on movement of the little finger only.

Cellulitis of the hand presents with generalised swelling, erythema and pain. The skin looks shiny and is warm to touch. Generally there is no exacerbation of pain with finger movement.



[Q: 4572] OnExamination 2012 -
Emergency Medicine

An 80-year-old man attends the Emergency department with falls.

On history taking you find that he had a stroke affecting his left arm and leg a year ago. A CT scan confirms that there is a right CVA. Carotid scanning shows stenosis of 80% on the right and 90% on the left.

What is the best course of action?

1- Bilateral carotid endarterectomy

2- Discharge and GP follow up

3- Discharge and outpatient follow up

4- Urgent carotid endarterectomy on the left

5- Urgent carotid endarterectomy on the right

Answer & Comments

Answer: 3- Discharge and outpatient follow up

This is a difficult question. The gentleman has obviously had a stroke which could be attributed to his carotid atherosclerosis. However, it is a significant period since he had his symptoms. The benefit of carotid endarterectomy is therefore less clear. It is not indicated urgently, and should be discussed with a specialist to weigh up the risks and benefits.



[Q: 4573] OnExamination 2012 -
Emergency Medicine

A gentleman attends the Emergency department with a stroke.

On the ward his stroke is starting to resolve and the likely diagnosis is a transient ischaemic attack (TIA).

Which is the next best course of action?

1- CT head and duplex as an outpatient

2- Discharge and follow up in TIA clinic

3- Discharge and GP follow up

4- Urgent carotid endarterectomy

5- Urgent CT head and carotid duplex whilst inpatient

Answer & Comments

Answer: 5- Urgent CT head and carotid duplex whilst inpatient

NICE guidelines for stroke and TIA treatment state that a patient with a TIA should receive a CT / MRI head and carotid duplex within a week and then surgery if necessary within two weeks.

Department of Health guidelines go further and state that surgery should occur within 48 hours of arrival.



[Q: 4574] OnExamination 2012 -
Emergency Medicine

A 22-year-old female is admitted very distressed and short of breath.

Examination reveals a respiratory rate of 35/min, a pulse of 120 beats per minute, a blood pressure 110/70 mmHg, oxygen saturations of 90% and a peak expiratory flow rate <50% predicted.

The emergency medical services have administered salbutamol 5 mg (twice) and face mask oxygen.

Which of the following is the most appropriate next action in this patient?

- 1- Arterial blood gas analysis
- 2- Intensive care referral
- 3- Oxygen 35%
- 4- Prednisolone 40 mg
- 5- Salbutamol 5 mg and ipratropium bromide 0.5 mg

Answer & Comments

Answer: 5- Salbutamol 5 mg and ipratropium bromide 0.5 mg

This patient fits the criteria for acute severe asthma. In such cases β_2 -agonists should be administered as soon as possible, preferably nebulised driven by oxygen. Repeat doses should be given at 15-30 minute intervals, or continuous nebulisation can be used where there is inadequate response to bolus therapy. Nebulised ipratropium bromide should be added for patients with acute severe or life threatening asthma, or those with a poor initial response. Its addition produces significantly greater bronchodilation than a β_2 -agonist alone.

Oxygen should be given to maintain saturations at 94-98%. Patients with saturations less than 92% on air should have an ABG to exclude hypercapnia. However, starting treatment should not be delayed to do the ABG. Initially high-flow oxygen is used, and then weaned to maintain adequate saturations. Unless you suspect COPD there isn't a need to be cautious with oxygen therapy.

Steroids reduce mortality, relapses, subsequent hospital admission and requirement for β_2 -agonists¹. The earlier they are given in the attack, the better the outcome. A dose of 40-50mg should therefore be given once oxygen and nebuliser therapy has been established. This should be continued for 5 days, or until recovery, and can then be stopped abruptly unless the patient has taken long-term oral corticosteroids.

Failure to respond to the above treatment steps may warrant the use of intravenous magnesium sulphate and aminophylline. However, these should not be used without discussion with your senior colleagues.

Intensive care is indicated for patients with severe acute or life threatening asthma who are failing to respond to therapy. Consider it in patients with deteriorating peak flow, persisting or worsening hypoxia, hypercapnia, acidosis, exhaustion or altered conscious state. All patients who are transferred to an intensive care unit should be accompanied by a doctor who can intubate if necessary.

As an aside, chest radiographs are not indicated unless you suspect pneumothorax or consolidation, or there is life-threatening asthma, a failure to respond to treatment or a need for ventilation.



[Q: 4575] OnExamination 2012 -
Emergency Medicine

A 18-year-old female is brought to the

Emergency department unconscious after having taken an overdose.

On examination she has a Glasgow coma score of 6, a respiratory rate of eight breaths per minute, a heart rate of 52 beats per minute and her blood pressure is 84/62 mmHg. Her pupils are small but are reactive to light, muscle tone is reduced and plantar responses are flexor.

Which of the following is she most likely to have taken in overdose?

- 1- Diazepam
- 2- Dihydrocodeine
- 3- Diphenhydramine
- 4- Ecstasy (MDMA)
- 5- Methanol

Answer & Comments

Answer: 2- Dihydrocodeine

Dihydrocodeine is an opiate analgesic and when taken in overdose has a number of toxic effects. It acts as a respiratory depressant leading to reduced respiratory rate. It can cause bradycardia and hypotension in large doses. Pupillary constriction is a diagnostic feature in opiate overdose.

It is also a central nervous system depressant and therefore causes coma in overdose.

Benzodiazepines and antihistamines tend not to have the same cardiorespiratory effects as opiates.

MDMA is a stimulant and can cause delirium, convulsions and ventricular arrhythmias.

Diazepam would be less likely here due to the bradycardia and the hypotension.



[Q: 4576] OnExamination 2012 - Emergency Medicine

An 18-year-old woman presents three days after allegedly taking 50 paracetamol tablets (25 g).

Which of the following tests measured at this time point would be most helpful in determining the outcome?

- 1- ALT concentration
- 2- Bilirubin concentration
- 3- Creatinine concentration
- 4- Paracetamol concentration
- 5- Prothrombin time

Answer & Comments

Answer: 5- Prothrombin time

The patient has ingested a seriously toxic dose of paracetamol.

The best determinant of this risk at 72 hours would be a prolonged prothrombin time.

Paracetamol concentrations would be rather meaningless at this point in time, and irrespective, she should be treated with N-acetylcysteine.

There are four phases of paracetamol overdose:

Phase 1 (0-24 hours)

Asymptomatic

Anorexia

Nausea or vomiting

Malaise

Subclinical rise in serum aspartate transaminase (AST) - 12 hours post ingestion.

Phase 2 (18-72 hours)

Right upper quadrant abdominal pain, anorexia, nausea, vomiting

Continued rise in serum transaminases levels (note this is the time slot for our patient with the alanine transaminase [ALT] rises).

Phase 3 (72-96 hours)

Centrilobular hepatic necrosis with continued abdominal pain

Jaundice

Coagulopathy

Hepatic encephalopathy

Nausea and vomiting

Renal failure

Fatally rising international normalised ratio/prothrombin time (INR/PT) from three days.

Phase 4 (Four days to three weeks)

Complete resolution of symptoms

Complete resolution of organ failure.



[Q: 4577] OnExamination 2012 -
Emergency Medicine

A 30-year-old man is admitted three hours after taking an overdose of amitriptyline and diazepam.

On examination he was drowsy with a Glasgow coma scale of 8, he had a pulse of 140 beats per minute, a blood pressure of 114/88 mmHg and dilated pupils. His oxygen saturation was 90% on room air.

What is the most appropriate initial action for this patient?

- 1- Activated charcoal
- 2- CT head scan
- 3- ECG
- 4- IV atenolol
- 5- IV flumazenil

Answer & Comments

Answer: 3- ECG

Obviously this patient with a markedly reduced GCS needs basic resuscitation. However, the most appropriate initial action specifically for his overdose would be to get

the investigations done as quickly as possible - arterial blood gases and ECG, as the latter may show QRS widening and merit treatment.

Gastric decontamination with lavage and activated charcoal is used if the patient presents within one hour of overdose.

Treatment with bicarbonate is also advocated as this patient displays features of severe TCA overdose. The aim is to get the pH >7.4.

He does not need a CT scan as the symptoms are typical of tricyclic overdose.

Flumazenil is not appropriate for this patient as the symptoms are mostly of TCA overdose nor is IV atenolol appropriate for the arrhythmias. A number of studies have shown that in cases of mixed benzodiazepine and tricyclic overdose, flumazenil can unmask the convulsant properties of TCAs and increase the severity of arrhythmias induced by them.

The arrhythmias induced by TCAs often respond to sodium bicarbonate, but if they don't intravenous glucagon can be used. Adrenaline and magnesium sulphate can also be used.



[Q: 4578] OnExamination 2012 -
Emergency Medicine

A 75-year-old man was admitted after being found collapsed in a garden shed surrounded by a number of empty containers.

On clinical examination the patient had small pupils, a heart rate of 50 beats per minute, and was frothing at the mouth.

What is the most likely diagnosis?

- 1- Creosote poisoning
- 2- Glyphosate poisoning
- 3- Organophosphorus poisoning
- 4- Paraquat poisoning
- 5- Pyrethroid poisoning

Answer & Comments

Answer: 3- Organophosphorus poisoning

The patient has cholinergic features with a relative bradycardia, small pupils and increased salivation. This is highly suggestive of organophosphorus poisoning which is an anticholinesterase, thus prolonging the effects of acetylcholine.

Paraquat is associated with nausea, vomiting and diarrhoea with ulceration.

Creosote is a petroleum based substance and would not have such an effect.

Glyphosate herbicides produce nausea, vomiting and diarrhoea with a caustic effect in the mouth.

Pyrethroid is an insecticide and poisoning is rare but associated with coma, convulsions and pulmonary oedema.



[Q: 4579] OnExamination 2012 - Emergency Medicine

An 18-year-old woman is admitted after taking drugs at a night club.

Which of the following features suggest she had taken Ecstasy (MDMA)?

- 1- A pyrexia of 40°C
- 2- Hyponatraemia
- 3- Hypokalaemia
- 4- Metabolic acidosis
- 5- Respiratory depression

Answer & Comments

Answer: 1- A pyrexia of 40°C

Features of the amphetamine MDMA abuse include:

Hyponatraemia
Tachycardia
Hyperventilation

Hyperthermia.



[Q: 4580] OnExamination 2012 - Emergency Medicine

A 19-year old girl has been brought to the Emergency department by her friends following a night out at a party. Her friends comment that she has been talking by herself about 'irrelevant things'. She seems agitated and restless.

On examination, her reflexes are increased and an electrocardiogram (ECG) demonstrates ventricular ectopics.

What kind of substance abuse do you suspect at this point?

- 1- Alcohol
- 2- Barbituate
- 3- Cannabis
- 4- Ecstasy
- 5- Glue sniffing

Answer & Comments

Answer: 4- Ecstasy

This is a case of ecstasy overdose.

Ecstasy (3,4-methylenedioxymethamphetamine, MDMA) stimulates the central nervous system.

It causes:

Increased alertness and self-confidence

Euphoria

Extrovert behaviour

Increased talkativeness with rapid speech

Lack of desire to eat or sleep

Tremor

Dilated pupils

Tachycardia and

Hypertension.

More severe intoxication is associated with:

Excitability

Agitation

Paranoid delusions

Hallucinations with violent behaviour

Hypertonia and

Hyperreflexia.

Convulsions, rhabdomyolysis, hyperthermia, and cardiac arrhythmias may also develop.

In severe cases of MDMA poisoning:

Hyperthermia

Disseminated intravascular coagulation

Rhabdomyolysis

Acute renal failure and

Hyponatraemia

are observed.

Hepatic damage has also been reported.

Rarely, poisoning due to amphetamines may result in intracerebral and subarachnoid haemorrhage and acute cardiomyopathy; these complications may be fatal.

Hyperthyroxinaemia may be found in chronic amphetamine users.



[Q: 4581] OnExamination 2012 -
Emergency Medicine

A 27-year-old female presents to the surgical intake with abdominal pain and a five day history of vomiting.

Over the last three months she has also been aware of a 6 kg weight loss.

On examination, she is pale, has a temperature of 38.5°C, blood pressure of 90/60 mmHg and pulse rate of 130 in sinus rhythm. The chest is clear on auscultation but

she has a diffusely tender abdomen with no guarding. Her BM reading is 2.5.

Initial biochemistry is as follows:

Sodium 124 mmol/l (137-144)

Potassium 6.0 mmol/l (3.5-4.9)

Urea 7.5 mmol/l (2.5-7.5)

Creatinine 78 µmol/l (60-110)

Glucose 2.0 mmol/l (3.0-6.0)

What is the probable diagnosis?

1- Abdominal migraine

2- Acute appendicitis

3- Acute cholecystitis

4- Addison's disease

5- Insulinoma

Answer & Comments

Answer: 4- Addison's disease

This patient has clinical features of hypoadrenal crisis with abdominal pain, vomiting and shock with hypoglycaemia, hyponatraemia and hyperkalaemia. In the UK this is commonly due to autoimmune destruction of the adrenal glands (Addison's disease). Rarer causes are TB, HIV adrenal haemorrhage or anterior pituitary disease. Patients classically present with weight loss, abdominal pain, lethargy and nausea and vomiting. Addison's disease is also associated with oral pigmentation (due to excess ACTH and therefore MSH), and other autoimmune disease (including thyroid disease and vitiligo).

Patients such as this need emergency fluid resuscitation, steroid administration (prior to this urgent cortisol measurement), and careful search for occult infection.

None of the other options explain the biochemical findings.



[Q: 4582] OnExamination 2012 -
Emergency Medicine

A 16-year-old male is brought to the Emergency department with a Glasgow coma scale (GCS) rating of 3/15.

Within 10 minutes he regained consciousness with a GCS of 15/15, is sitting up and talking.

What is he likely to have taken?

- 1- Inhaled solvent glue
- 2- Smoked heroin
- 3- Smoked marijuana
- 4- Snorted cocaine
- 5- Taken ecstasy

Answer & Comments

Answer: 1- Inhaled solvent glue

This patient was markedly comatose on arrival but quickly regains consciousness. This suggests a short acting (probably) inhaled anaesthetic-like agent - glue.

Marijuana would not be expected to produce this level of coma and the effects of cocaine would last much longer.

The inhaled solvents, due to their lipophilicity, are rapidly absorbed through the lungs and then quickly distributed to the brain and other organs. The effects therefore appear within minutes of inhalation.

Typical substances that are inhaled include toluene aromatic hydrocarbons and butane.



[Q: 4583] OnExamination 2012 -
Emergency Medicine

A 14-year-old boy bangs heads with an opponent during an unofficial football game. He is knocked out for 30 seconds and is amnesic for the event. He recovers quickly and continues playing.

The following day he complains of headache, begins vomiting then loses consciousness.

He had a full term normal delivery with no neonatal complications. His immunisations are up to date. There is no family or social history of note.

On examination he responds only to deep pain. He is afebrile with respiratory rate of 10/min (irregular), pulse of 40/min. He has a large bruise in the right temporal area.

What is the most likely diagnosis?

- 1- Cerebral contusion
- 2- Contracoup injury
- 3- Extradural haematoma
- 4- Subdural haematoma
- 5- Parietal skull fracture

Answer & Comments

Answer: 4- Subdural haematoma

The history is of a closed head injury, followed by a lucid period followed by decreasing level of consciousness.

The time course suggests a subdural haematoma where there is venous bleeding which accumulates in the subdural area causing raised intracranial pressure. This may in time progress to tonsillar herniation.

Epidural haematoma (extradural haemorrhage), typically from a torn middle meningeal artery and associated with skull fracture, accumulates much more rapidly. There may be apparent recovery from the initial concussion, but deterioration is usually within 15-30 minutes.



[Q: 4584] OnExamination 2012 -
Emergency Medicine

A 55-year-old male presented six hours after taking an overdose of lithium tablets which had been prescribed for a bipolar affective disorder.

On examination he was tremulous, had suffered a convulsion and had a Glasgow

coma scale of 12/15. His serum lithium concentration was 5.0 mmol/L (0.5-1.0)

What is the most appropriate management of this patient?

- 1- Activated charcoal
- 2- Forced alkaline diuresis
- 3- Furosemide 100 mg intravenously twice daily
- 4- Haemodialysis
- 5- Measure lithium concentration in 2 hours

Answer & Comments

Answer: 4- Haemodialysis

The patient has a severe lithium overdose as reflected by markedly elevated lithium concentrations and features of impaired consciousness, tremor and seizures.

This needs urgent management.

Activated charcoal does not bind lithium effectively and is therefore ineffective except where co-ingestion of other poisons is suspected.

Haemodialysis is the mainstay of treatment for acute lithium toxicity.